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REPORT

FINAL

Evaluation of the Value Chain Training Subactivity of the Growing High-Value Agriculture Sales Activity in Moldova: Baseline Findings from the 2012-2013 Farm Operator Survey

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I. INTRODUCTION

Moldova has traditionally enjoyed a strong agricultural sector, especially in high-value agriculture products such as fruits and vegetables. Since the collapse of the Soviet Union, however, Moldova has seen a decline in its agricultural sector accompanied by a decline in its living standards. This economic situation has raised new challenges related to the production, processing, and transportation of high-value agriculture products, as well as access to export markets. Despite recent improvements in its overall economy, Moldova remains one of the poorest countries in Europe (United Nations Development Programme 2013).

Moldova's location, fertile soil, and favorable climate put it in an excellent position to expand the production and sales of high-value agriculture products, as a means both to redress poverty and make Moldova more competitive in the global marketplace. But the country's ability to grow its agricultural sector also depends on stimulating investment, learning about modern agricultural techniques, raising the quality of its exports, and improving key aspects of its infrastructure, such as irrigation and transportation.

To address some of these challenges, the Millennium Challenge Corporation, through its compact with Moldova, is sponsoring two projects: the Transition to High-Value Agriculture Project and the Road Rehabilitation Project. The Millennium Challenge Corporation contracted with Mathematica Policy Research to evaluate the effectiveness of the Transition to High-Value Agriculture Project, which comprises several activities (and subactivities) intended to increase rural incomes and catalyze future investments in high-value agriculture. The ultimate purpose of the overall evaluation of the Transition to High-Value Agriculture Project is to determine the effectiveness of the compact activities at increasing investment in high-value agriculture, and the extent to which those activities are reducing poverty and generating economic growth.

This report focuses on the evaluation of one specific project subactivity, the value chain training subactivity, which provides targeted training to existing producers of specific high-value crops, such as apples, plums, and tomatoes. These producer trainings are part of a broader effort to grow sales of high-value agriculture by addressing constraints in specific value chains (the steps required to bring a product to market), known as the Growing High-Value Agricultural Sales Activity. In terms of funding share, the Growing High-Value Agricultural Sales Activity—and the value chain training subactivity within that activity—represent a small part of the Transition to High-Value Agriculture Project. Therefore, the evaluation described in this report is focused on a relatively small component of the overall project.

In this report, we analyze baseline data collected for the evaluation of the value chain training. The evaluation will ultimately measure the impact of the value chain trainings on producers; it will use a random assignment design that compares changes in outcomes for targeted farmers in communities randomly selected for value chain training (treatment communities) with changes in outcomes for targeted farmers in communities that do not receive value chain training (control communities). Our analysis of the baseline data in this report seeks to provide context for the impact evaluation by (1) describing the farm operators in the evaluation, including their characteristics, agricultural practices, and production, and (2) assessing the similarity of treatment and control communities at baseline, to determine the validity of the randomized design.

The baseline data were collected from the 2012–2013 Farm Operator Survey. Farm operators participating in the survey provided information on farm characteristics, agricultural practices, production, revenue, and costs, as well as other outcomes. The 2012–2013 survey focused on farm outcomes from the 2012 agricultural season (ending October 2012) and included two survey samples—one for the value chain training evaluation, and one for the irrigation evaluation (however, a small number of farmers were in both survey samples).[1] For the value chain training evaluation, 2,110 farm operators were interviewed in 83 communities between January and March 2013. Although the 2012–2013 survey was initially intended to provide a baseline for the value chain training evaluation, some value chain trainings had already been implemented by the time the survey was conducted. Although throughout the report we refer to this survey round as "baseline," some differences between treatment and control farmers could be driven by early impacts of training. In our analysis, we explore the degree to which one can consider data from this survey a true baseline.

In the remainder of this chapter, we describe in greater detail the value chain trainings, evaluation design, and survey. In the chapters that follow, we present separately for treatment and control communities descriptive statistics for key characteristics and outcomes measured in the survey. Specifically, Chapter II provides a brief description of household and farm characteristics; Chapter III discusses farm production, farm profits, and household income; Chapter IV discusses participation in agricultural training; Chapter V discusses farmers' information sources and use of agricultural practices; and Chapter VI discusses agricultural credit applications and loans received. Throughout, we test for differences between treatment and control communities along these dimensions to help assess the validity of our random assignment design. In Chapter VII, we estimate participation rates in value chain training and patterns of practice knowledge and use for communities in our sample, to assess whether the 2012–2013 survey can be treated as a baseline. In Chapter VIII, we present information on gender differences in farm participation, differences in outcomes between male- and female-operated farms, and differences in reports between farm operators and their spouses. We conclude in Chapter IX.

A. Value chain training

As mentioned earlier, value chain training is one component of a larger effort to increase sales of high-value crops, the Growing High-Value Agricultural Sales Activity. This activity is part of the Agricultural Competitiveness and Enterprise Development (ACED) Project, which is funded jointly by the Millennium Challenge Corporation and the United States Agency for International Development; it is divided into four subactivities: (1) high-value agriculture-market development and expansion (including end-market studies and linkages to potential investors), (2) training to upgrade production and meet buyer requirements, (3) demand-driven technical assistance to enterprises, associations, and cooperatives, and (4) the improvement of an enabling environment for high-value agriculture (including strengthening phytosanitary inspection and testing capacity).[2] These complementary subactivities are implemented using a value chain

[1] In a separate report, we analyzed the data collected to inform the evaluation of the irrigation sector reform and system rehabilitation effort (Borkum et al. 2015).

[2] Phytosanitary inspections provide assurance that plants or plant products are considered free of pests and conform with regulations.

approach, which means that they focus on particular crops and the challenges faced by different participants in each crop's value chain, including input suppliers, farmers, packers, consolidators, processors, transporters, and exporters. Using the different subactivities as levers, the Growing High-Value Agricultural Sales Activity aims to increase sales of high-value agriculture by addressing constraints specific to each selected value chain.

Value chain training—the focus of this evaluation—aims to help farmers of high-value agriculture products upgrade production and improve the efficiency of post-harvest activities, such as processing, transporting, and delivering products to consumers (Table I.1).[3] Trainings target farmers who are already cultivating specific high-value crops, and are delivered using classroom instruction, demonstration plots, farmer field days, and other methods. The project intends to benefit not only the farmers who attend training, but also other farmers and other value chain participants with whom trained farmers share information.

Table I.1. Selected value chain training topics

Value chain	Training topics (illustrative)
Apples	Apple tree pruning and training; use of weather stations for production risk management; apple tree pruning, training, and plant protection; fruit thinning and green operations in apple orchards
Plums	New varieties, harvesting, and post-harvest handling in plum production; plum tree pruning and training
Sweet cherries	Advanced technologies in cherry production; new technologies of production and cherry post-harvesting; peculiarities of sweet cherry tree pruning
Table grapes	Table grapes pruning and training; table grapes crop quality management; harvesting and post-harvesting techniques for table grapes
Tomatoes	Advanced technologies and new varieties in vegetable production; greenhouse cost analysis; tomato seedlings growing; indeterminate tomato growth and proper fertilization

Source: ACED Project.

Note: Table presents a selection of training topics for a selection of value chains.

Since June 2011, the ACED project has conducted trainings on the production of fruits and vegetables, including apples, plums, peaches, sweet cherries, table grapes, berries, tomatoes, and cucumbers. As of May 2013, ACED had conducted 184 value chain trainings in 46 communities across Moldova. Although there is variation across communities, in most cases, a given community hosts more than one training; often, ACED offers a series of related trainings over the course of months or even years.

[3] Additional training is being offered through the Growing High-Value Agriculture Sales Activity in the 11 centralized irrigation systems that have been selected for water management transfer and irrigation system rehabilitation. Although there may be some similarities between the value chain trainings and these other trainings, this report focuses on the value chain trainings.

B. Evaluation design

The main goal of the evaluation of value chain training is to determine the extent, if any, to which trainings increase practice use, production, sales, and farm income.[4] Although the trainings are part of a multipronged effort to increase high-value agriculture sales, the evaluation focuses on isolating the impacts of value chain training over and above the impacts of the other components of the Growing High-Value Agriculture Sales Activity. In fact, the evaluation provides a unique opportunity, because the project's approach—in which a targeted training is implemented at the same time that other value chain constraints are addressed—has the potential to enhance the impacts of training.

1. Research questions

The 2012–2013 Farm Operator Survey was designed to address several key research questions established at the outset of the evaluation (and compact). However, since the 2012–2013 survey was fielded, the Millennium Challenge Corporation and the Millennium Challenge Account–Moldova have developed a revised list of research questions for the evaluation. The following research questions are similar to the original research questions but have been revised to focus on outcomes for which impacts are likely to be measureable:

1. What is the impact of value chain training on adoption of new practices and production (yield) within the context of a value chain project? Do these impacts vary by value chain? Were some practices or combinations of practices adopted more than others, and why or why not?
2. Does distance from a value chain training site affect participation in training? What other factors affect participation?
3. To what degree are new practices adopted by value chain participants who do not themselves participate in value chain training activities? To what extent can adoption by nonparticipants be attributed to program ripple effects, rather than broader trends (or were they already using these practices)?
4. How does the impact of value chain training on adoption of new practices and production vary with the characteristics of farm operators and farm households?

The evaluation will address the research questions using both quantitative and qualitative methods. In the next subsection, we describe the random assignment design that we will use to estimate quantitative impacts. The quantitative design will be complemented with a qualitative approach that will use insights from farm operators, mayors, and other stakeholders to enrich our understanding of the impact of the activities.

[4] The revised evaluation questions do not include sales and farm income as key outcomes. In this report, we include analysis of sales and farm income, as these outcomes were included in the research questions that motivated the data collection effort.

2. Random assignment design

In the quantitative impact evaluation, we will estimate impacts using a random assignment design. At the outset of the evaluation, the ACED project identified 80 potential training communities for inclusion in the quantitative impact evaluation (Figure I.1).[5] For each community, ACED identified one or more value chains (tree fruits, table grapes, and/or vegetables), with the expectation that, if a community were selected for training, trainings in that community would focus on those value chains. (After random assignment, ACED provided more specific information about the tree fruits that it would target in each tree fruit community—in both treatment and control groups; this data enabled us to more precisely target farmers who would be likely to participate in training, if it were offered.[6])

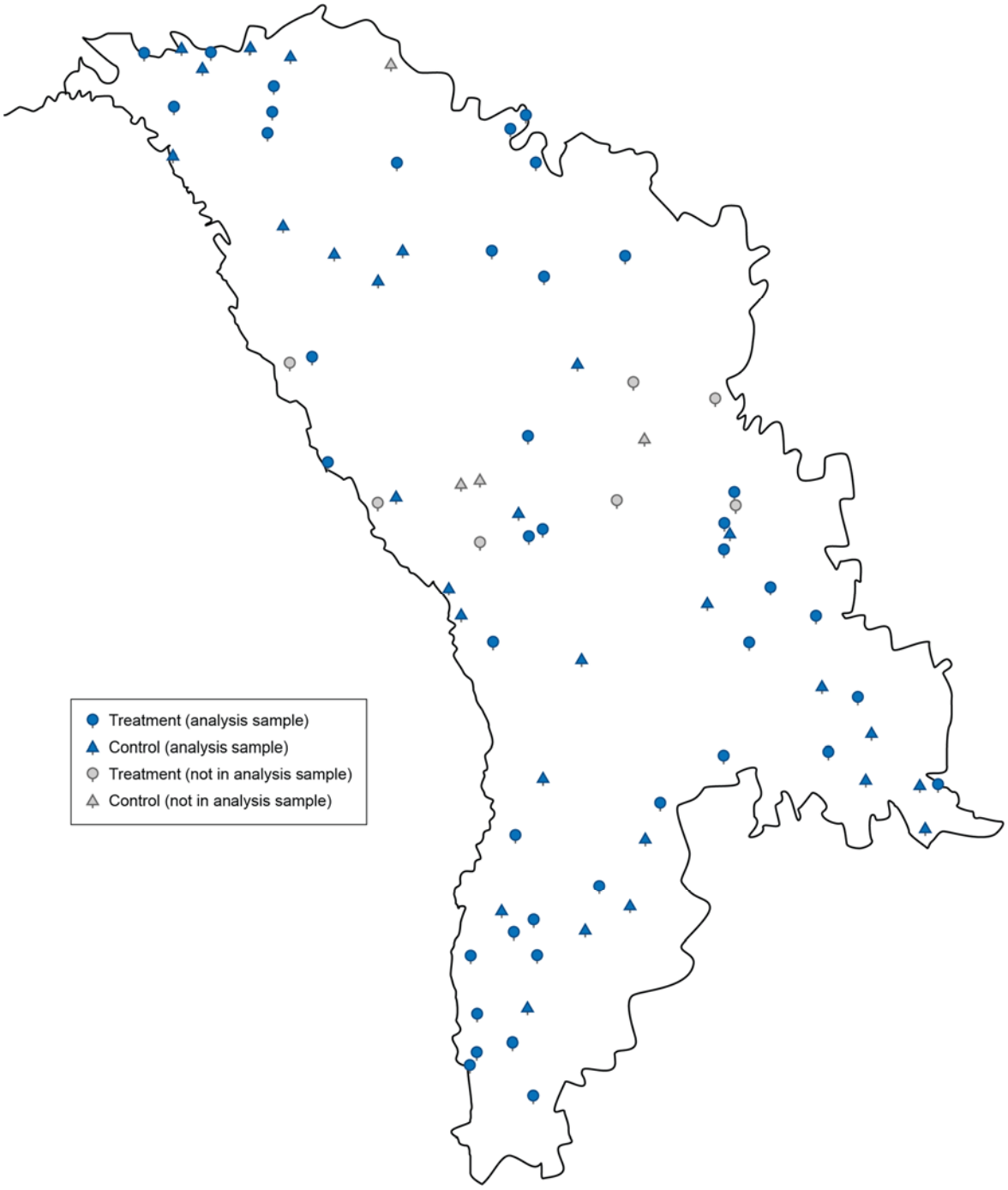
In September 2011, potential training sites were randomly assigned to treatment and control groups. Training activities could be conducted at sites assigned to the treatment group, and would not be conducted at sites assigned to the control group. We assigned 60 percent of sites (48 communities) to the treatment group, and 40 percent (32 communities) to the control group.

To ensure representation of all value chains and regions in both the treatment and control groups, we conducted random assignment within value chain and region (north, center, and south). In addition to ensuring balance across treatment and control groups, stratifying random assignment by value chain and region improves statistical power. In some sites, ACED expected to offer trainings serving more than one value chain. These multicrop sites, as well as the limited number of sites in some value chain region groups, made it necessary for some strata to include more than one targeted crop (Table I.2). After establishing strata, random assignment was conducted within the stratum (that is, within region and value chain group), with the assignment ratio as close as possible to 60:40 (with some differences due to rounding).

[5] Ten of the 80 communities are part of the 11 centralized irrigation systems that have been selected for water management transfer and irrigation system rehabilitation.

[6] After random assignment, there was an additional change to the list of targeted crops. For one community previously identified as a community in which tree fruits (along with vegetables) would be targeted, we learned that table grapes (along with vegetables) would instead be targeted.

Figure I.1. Treatment and control communities, value chain training evaluation



Note: Map of Moldova. Locations are approximate. Analysis sample excludes communities in which there were no interviews with farmers in targeted value chains. Analysis sample also excludes communities from one stratum in which there were virtually no control farmers.

Table I.2. Strata for random assignment, value chain training evaluation

Region	Value chains identified for training	Communities		
		Treatment	Control	Total
North	Tree fruits	7	5	12
North	Vegetables	2	2	4
North	Tree fruits and vegetables	6	3	9
Center	Table grapes; table grapes and tree fruits; table grapes and vegetables; table grapes, tree fruits, and vegetables	5	4	9
Center	Vegetables	7	4	11
Center	Tree fruits; tree fruits and vegetables	5	3	8
South	Table grapes; table grapes and tree fruits; table grapes and vegetables; table grapes, tree fruits, and vegetables	10	6	16
South	Vegetables	3	2	5
South	Tree fruits; tree fruits and vegetables	4	2	6
Total		**48**	**32**	**80**

If all farmers in targeted value chains who live in (or near) a treatment community participate in training, and those who live in control communities are less likely to participate, then impacts can be estimated by comparing targeted farmers who live in treatment communities with farmers in targeted value chains who live in control communities. However, some farmers who live in control communities could still choose to travel long distances to attend training, and such farmers would not be barred from participating. At the same time, some farmers who live in treatment communities may choose not to participate. Hence, random assignment does not necessarily separate farmers who attend training from those who do not. Instead, randomly assigning the location of training activities (among potential sites) changes the *probability* that farmers attend training, assuming that those who live closer are more likely to attend. If many control group farmers choose to attend training, we will account for this feature in estimating the impacts of attending training using an instrumental variables framework. In particular, we will use distance from training site as an instrument for training participation. If distance is predictive of training participation, this approach will allow us to estimate the impacts of participation on farmers' outcomes.

Though the evaluation will focus on the 80 communities that were included in random assignment, ACED is also conducting value chain training in other locations. At the time of random assignment, ACED also identified eight "A-list" communities—the highest-priority sites for training implementation. A-list communities were excluded from the random assignment procedure and have received training. In addition to the A-list communities, ACED is conducting value chain training in other selected communities.[7]

[7] Training outside the treatment communities and A-list communities can occur in communities that are sufficiently far (> 15 km) from control communities, or for which there is a strong justification for inclusion.

3. Qualitative data collection

The impact evaluation will be supplemented by a qualitative study contracted by the Millennium Challenge Account–Moldova. The qualitative study aims (1) to help inform the interpretation of the quantitative data analysis; (2) to help understand the interaction between the value chain training and other components of the Transition to High-Value Agriculture Project; and (3) to identify key challenges and barriers to successful implementation that might provide input for program monitoring, course corrections, and future program design.

In 2013, the qualitative data collection effort included the following activities:

1. Focus groups with small-farm operators in three treatment communities in which value chain trainings had been held (one in each value chain: table grapes, apples, and tomatoes)
2. Interviews with operators of medium and large farms in the same three treatment communities
3. Interviews with mayors in the same three treatment communities

The focus groups and interviews gathered in-depth information on cultivation of targeted crops, marketing of targeted crops, post-harvest practices, awareness and attitudes toward new agricultural practices, and experiences with value chain trainings. The Millennium Challenge Account–Moldova's contractor prepared a report summarizing the findings (ACT Research 2013). In 2014, the Millennium Challenge Account–Moldova collected additional qualitative data from regional training service providers, value chain buyers, ACED staff, and extension service providers to gain insight into how implementation was progressing (ACT Research 2014). Qualitative data collection in future years will be used in the final evaluation report.

C. Moldova Farm Operator Survey

The quantitative evaluation will be based on data gathered from farm households or farms through the Moldova Farm Operator Survey. The 2012–2013 survey relied on two questionnaires: one for small and medium farms, and another for large farms, which are typically operated as businesses. The questionnaire was designed to address the key research questions, as well as other interests of the Millennium Challenge Corporation and the Millennium Challenge Account–Moldova. Some questions were drawn from the 2008 Farm Operator Survey, which was administered during compact development.

The questionnaire contains several modules (Table I.3; Appendix D shows the small and medium farm questionnaire; Appendix E shows the large farm questionnaire). The survey collected data on basic household/farm characteristics, together with a range of outcome measures, including the main final program outcomes (production, sales, and farm income) and intermediate outcomes (such as use of agricultural practices). For the most part, the small/medium and large questionnaires were the same, with differences reflecting the fact that large farms are not typically household farms. Most questions were asked only of a single respondent, but (for small/medium farms only) a handful of questions were asked of both the farm operator and his or her spouse, to obtain different perspectives on gender dynamics within the household.

Table I.3. Farm Operator Survey modules (2012–2013)

Module	Key topics covered
Household Roster (small/medium only)	Demographic and socioeconomic information on all members of the household, such as age, gender, relationship to head of household, education level, migration, and marital status
Farm Information (large only)	Respondent characteristics; legal status; characteristics of owners, including gender, age, education, experience, and employment on farm; hired labor and wages paid to laborers
Household, Farm, and Community Characteristics	Land holdings (owned, rented); land cultivated inside and outside the centralized irrigation system command area; land irrigated; farm decision making by household members (small/medium only, *); asset ownership (*); asset control/use by household members (small/medium only, *); cold storage access and use; irrigation water use; participation in producer/agricultural organizations, cooperatives, and savings and credit associations (*)
Farm Production, Revenue, and Costs	Crops cultivated and harvested; characteristics of sales, including value, timing, destination, point of sale, and buyer; expenditures on agricultural inputs, including wages paid to laborers
Crop and Post-Harvesting Practices/Equipment	Knowledge and use of practices/equipment for apples, table grapes, vegetables, or stone fruits; reasons for not using practices; source of information on practices/equipment
Agricultural Training	Participation in agricultural training; for as many as three trainings in the last year, details including month of training, topics covered, training provider, and satisfaction with training
Other Farming Experience	Sources of different types of information, including agricultural practices and markets; cooperation with other farmers in sales; weather or pests that affected production; perceived level of rainfall; time use during agricultural season (*)
Credit	Loan applications; for loans approved in the past two years, details including purpose of the loan, source of credit, loan size, collateral value, term, and interest rate; reasons for rejection; reasons for not applying for loans
Employment and Income (small/medium only)	Occupation of household members, nonagricultural income (for example, wages, remittances, government transfers, sales of nonagricultural products, rental payments received, and so on)
Consumption (small/medium only)	Household consumption/expenditure (excluding agricultural expenses), value of agricultural production consumed by the household

(*) = Asked separately of the farm operator and his/her spouse in small/medium farm households

No asterisk = Asked only of farm operator.

Source: 2012–2013 Moldova Farm Operator Survey.

Note: The questionnaire administered to the irrigation evaluation sample included additional modules on plot-specific cultivation and irrigation management, satisfaction, and usage.

The 2012–2013 survey was administered to farm households or farms cultivating targeted crops in treatment, control, and A-list communities. The survey sample was selected from lists of existing producers of the targeted crops in each community. Depending on the community, targeted crops included apples, plums, peaches, sweet cherries, almonds or walnuts, table grapes, and vegetables.[8] There were relatively few medium (10 to 100 hectares) and large (100 hectares or more) farms growing targeted crops in these communities. Therefore, all medium and large farms were asked to participate in the survey. For small farms (smaller than 10 hectares), we selected a sample of operators (Appendix A details the sampling approach). By applying appropriate weights, we were able to ensure that our sample was representative of all farmers growing targeted crops in these communities (Appendix A describes these weights).

The 2012–2013 survey was administered between January and March 2013. There were 2,110 respondents from the value chain training sample: 1,202 in 45 treatment communities, 708 in 30 control communities, and 200 in eight A-list communities.[9,10] The overall response rate to the survey was 83 percent in treatment and control communities.

Our analysis sample does not include all respondents to the survey. In particular, it includes 902 farmers in 41 treatment communities, 563 farmers in 28 control communities, and 200 farmers in the eight A-list communities (Table I.4). (Appendix B compares A-list communities with treatment communities along key dimensions.) The analysis sample excludes farmers from one stratum (center region, cultivating tree fruits, or tree fruits and vegetables) that had five treatment communities and three control communities.[11] We excluded communities from this stratum because it contained virtually no control farmers–one of the three control communities had no farmers in the targeted value chain, another received training, and the other had very few farmers. If we were to include these farms in the impact analysis, we would give disproportionate weight to a small number of farmers.

[8] In particular, vegetable-growers included producers of tomatoes, cucumbers, sweet peppers, salad greens, and culinary herbs who cultivated one or more of these vegetables in a greenhouse.

[9] Not all 80 treatment and control communities were included in the survey because, in some cases, there were no farmers identified in these communities who cultivated the targeted crops. As discussed in Appendix A, there were additional farmers interviewed in communities that neighbored treatment and control communities (supplemental communities), but those data are not included here.

[10] Overall, the data collection contractor identified 2,694 eligible farms in treatment communities, 2,875 eligible farms in control communities, and 1,412 eligible farms in A-list communities. The number of respondents was lower than the number of eligible farms because: (1) we drew a sample of small farms rather than attempting to survey all small farms, (2) some of the sampled farms did not respond to the survey and replacements were not always available, and (3) some of the sampled farms were subsequently determined to be ineligible—for example, because they did not cultivate the targeted crops.

[11] In this stratum, there were no completed interviews with targeted farmers in one of the treatment communities and one of the control communities.

Table I.4. Number of communities and farm operators in value chain training analysis sample

Value chain	Treatment	Control	A-List
Communities			
Vegetables	22	16	5
Table grapes	15	10	3
Tree Fruits	26	18	3
Total	41	28	8
Small farms, <10 ha			
Vegetables	358	85	100
Table grapes	191	178	75
Tree fruits	266	296	7
Total	794	508	182
Medium farms, 10–100 ha			
Vegetables	15	6	3
Table Grapes	22	9	6
Tree Fruits	53	22	4
Total	80	35	12
Large farms, ≥100 ha			
Vegetables	2	6	0
Table Grapes	7	4	4
Tree Fruits	24	16	4
Total	28	20	6
All farms			
Vegetables	375	97	103
Table grapes	220	191	85
Tree fruits	343	334	15
Total	902	563	200

Source: 2012–2013 Moldova Farm Operator Survey Sample Frame.

Note: Table presents the number of communities in the value chain training analysis sample by value chain and treatment assignment, as well as the total number of farm operators in the value chain training analysis sample by farm size, value chain, and treatment assignment. Tree fruits include apples, almonds or walnuts, peaches, plums, and sweet cherries. The same community can appear in multiple value chain cells (within a given treatment status) if more than one crop was targeted; therefore, the total number of communities is not equal to the column totals. The same farm operator can appear in multiple value chain cells (within a given size and treatment status) if the farmer cultivated multiple targeted crops in his or her community; therefore, the total number of farm operators is not equal to the column totals.

ha = hectares.

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II. HOUSEHOLD AND FARM CHARACTERISTICS

In this chapter, we examine the baseline characteristics of the households and farms in our sample, which includes farmers who cultivated targeted crops in the communities included in the evaluation. This information provides important context for the ultimate impact analysis and helps us understand the types of households and farms that may be affected by the value chain trainings. Because some of these characteristics might be related to the outcomes of interest, we would also like to determine the extent to which random assignment generated treatment and control samples that are similar in terms of these characteristics at baseline. Some of these characteristics will also serve as explanatory variables in the regression models we will ultimately use to estimate impacts.

The Farm Operator Survey captured information on household characteristics for small and medium farms through a roster of household members. The roster included household members who lived in the household for at least three months of the year and relied on the same budget. It also identified the farm operator (the primary respondent to the survey), defined as the member of the household who was most knowledgeable about farm operations, enabling us to examine farm operator characteristics. We did not include a household roster for large farms, which typically operate as businesses rather than household enterprises. The survey captured information on each large farm's characteristics from a knowledgeable respondent associated with the farm. Table II.1 summarizes the key household and farm characteristics included in the questionnaire.

Table II.1. Measures of household and farm characteristics

Measures	Time frame
Household Roster—Small and Medium Farms. List of all household members (including respondent); relation to the head of household; gender; age; education level; primary residence during the 2012 agricultural season.	As of survey date
Farm Characteristics—Large Farms. Role of respondent; years in operation; number of owners; number of paid employees.	As of survey date
Cultivated Area. Cultivated area.	2012 agricultural season

A. Household and respondent characteristics

The typical head of the small and medium farm households in our treatment sample was a male, in his 50s, who had completed a secondary education (Table II.2). The age of more than one-quarter of household heads in the treatment sample was 60 or older, the median age was 53, and only about one in 10 household heads were female. The vast majority of household heads in the treatment sample had completed a secondary education (47 percent) or at least some secondary education (33 percent). Although the head of household and the survey respondent were often the same person, 23 percent of respondents in the treatment sample identified another family member as the head of household (not shown).

Table II.2. Head of household and respondent characteristics for small and medium farms (percentage of farms unless otherwise indicated)

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Head of Household						
Age (years)	851	532				0.42[a]
Younger than 40			12.3	18.2	-5.8	0.20
40–49			23.4	23.8	-0.7	0.82
50–59			37.9	33.0	4.5	0.28
60 and older			26.5	25.0	2.0	0.52
Median			53	52	--	--
Female	860	540	10.2	10.8	-0.2	0.93
Education	859	537				0.04**[a]
Less than secondary			3.5	6.2	-2.5	0.17
Some secondary			32.6	47.7	-14.7	0.02**
Completed secondary			46.7	29.4	16.4	0.00***
Higher			17.1	16.6	0.8	0.82
Respondent						
Age (years)	865	534				0.67[a]
Younger than 40			14.2	18.0	-3.6	0.43
40–49			23.6	24.6	-1.2	0.68
50–59			37.4	33.6	3.4	0.33
60 and older			24.7	23.8	1.4	0.67
Median			53	52	--	--
Female	874	541	30.6	15.1	15.8	0.00***
Education	873	539				0.09*[a]
Less than secondary			3.5	5.2	-1.5	0.41
Some secondary			31.4	46.2	-14.4	0.02**
Completed secondary			46.8	32.3	13.7	0.01**
Higher			18.3	16.3	2.2	0.55

Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table presents characteristics of household heads (first panel) and survey respondents (second panel) for small (<10 ha) and medium (≥10 to <100 ha) farms. Large farms (≥100 ha) are not included because the large-farm survey does not identify a single operator. Percentages and medians are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control communities are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Because of the regression adjustment, these treatment-control differences may not be equal to the raw differences. Reported *p*-values are adjusted for clustering at the community level.

[a] *p*-Value from a Pearson chi-squared test for equivalence of the treatment and control distributions, adjusting for clustering at the community level.

*/**/***Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

The characteristics of respondents were generally similar to those of the household head, except that a larger percentage of respondents were female (31 percent in the treatment sample). As we show in Chapter VIII, many households reported that a male household head and his female spouse were jointly responsible for farming decisions. Because both may therefore have been eligible respondents (as farm operators), the female spouse might have elected to answer the survey—leading to a larger percentage of female respondents.

There are some large and statistically significant differences between the treatment and control samples in terms of education and gender. Specifically, households in the treatment sample are more likely to have household heads and respondents who completed a secondary education (so that the overall distribution of educational level is significantly different), and are much more likely to have a female farm operator (respondent) compared with those in the control sample.

Households in the sample are relatively small, on average, with a median of three members in both the treatment and control samples (Table II.3). Only about one-third of households in the treatment sample included any children under age 18. About 7 percent of households in the treatment sample reported that a member of their household lived primarily abroad during the agricultural season—results of the qualitative study (ACT Research 2013) suggest this finding could reflect migration for work. These characteristics are all similar in the control sample.

Table II.3. Household characteristics for small and medium farms (percentage of farms unless otherwise indicated)

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Household members	874	543				0.20 [a]
1			5.7	6.3	-0.2	0.93
2			29.0	23.2	5.9	0.10*
3			22.3	24.5	-2.2	0.52
4			24.5	34.0	-9.8	0.00***
≥5			18.6	12.1	6.4	0.07*
Median			3	3	--	--
Children in household	874	543				0.51 [a]
0			62.3	63.4	-0.8	0.88
1			21.5	17.5	3.8	0.06*
≥2			16.2	19.1	-3.0	0.55
Median			0	0	--	--
Any adult household member abroad	870	536	7.0	5.1	1.6	0.29

Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table presents characteristics of households for small (<10 ha) and medium (≥10 to <100 ha) farms. Because the large-farm survey does not include a household roster, large farms (≥100 ha) are not included. Children are defined as younger than 18 years of age. Percentages and medians are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control communities are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Because of the regression adjustment, these treatment-control differences may not be equal to the raw differences. Reported *p*-values are adjusted for clustering at the community level.

[a] *p*-Value from a Pearson chi-squared test for equivalence of the treatment and control distributions, adjusting for clustering at the community level.

*/**/***Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

B. Large-farm characteristics

For large farms, the Farm Operator Survey asked a person knowledgeable about the farm's operations to respond to the questionnaire. About 52 percent of respondents to the large-farm survey in the treatment sample were farm employees; the other respondents were owners or shareholders (Table II.4). In the control sample, respondents were less likely to report being employees and more likely to report "other" roles. "Other" respondents might include, for example, managers or accountants, if they did select "employee." In the 2013-2014 FOS, we include separate categories for manager and accountant/economist. Large farms typically had multiple owners (only about one in five in the treatment sample had a single owner) and were well established, with 74 percent of farms in the treatment sample having been in existence for more than 10 years, and only 3 percent for fewer than 5 years. Large farms also tended to have many employees, with a median of 14 in the treatment sample. Some of these characteristics, such as the percentage of large farm respondents who were employees and the percentage of large farms with many employees, were very different in magnitude between the treatment and control samples. However, because of the small sample size for large farms, we would expect some differences even with random assignment.

Table II.4. Large farm characteristics (percentage of farms unless otherwise indicated)

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Farm role of respondent	28	20				0.06[a]
Owner/shareholder			48.3	50.1	-0.2	0.99
Employee			51.7	20.4	29.8	0.02**
Other			0.0	29.5	-29.6	0.01**
Number of owners	26	19				0.78 [a]
1			18.9	22.5	-3.7	0.85
2			26.2	36.4	-11.0	0.59
3			14.2	4.3	10.2	0.15
≥4			40.7	36.9	4.6	0.77
Median			3	2	--	--
Years farm in existence	28	19				0.45[a]
<5			3.4	13.2	-10.0	0.20
5–10			22.7	14.0	7.7	0.47
>10			73.9	72.8	2.2	0.82
Median			13	13	--	--
Number of paid employees	23	18				0.33[a]
0			4.1	0.0	4.2	0.39
1–10			33.9	16.6	18.4	0.26
11–20			29.2	15.8	7.3	0.59
>20			32.8	67.6	-29.9	0.03**
Median			14	48	--	--

Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table presents characteristics of large farms (≥100 ha). Percentages and medians are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control communities are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Because of the regression adjustment, these treatment-control differences may not be equal to the raw differences. Reported *p*-values are adjusted for clustering at the community level.

[a]*p*-Value from a Pearson chi-squared test for equivalence of the treatment and control distributions, adjusting for clustering at the community level.

*/**/***Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

C. Cultivated area

Most of the farms in our sample cultivate a relatively small area of land. About 25 percent of all farms in the treatment sample cultivated less than a hectare, and 53 percent cultivated between one and five hectares; the median farmer in the treatment sample cultivated an area of less than two hectares (Table II.5) The mean area cultivated is substantially higher, and is driven by the relatively few larger-scale farms in the sample. The median, mean, and overall distribution of area cultivated are very similar in the control sample.

Table II.5. Cultivated area (percentage of farms unless otherwise indicated)

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Total area cultivated per farm	898	563				0.86[a]
<1 ha			25.2	28.2	-4.1	0.49
≥1–<5 ha			52.9	50.7	2.7	0.67
≥5–<10 ha			8.1	5.6	2.6	0.21
≥10–<100 ha			9.4	10.5	-0.8	0.77
≥100 ha			4.4	5.0	-0.5	0.85
Median (ha)			1.67	2.13	--	--
Mean (ha)	898	563	46.9	50.3	-2.2	0.93

Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table presents area of land cultivated for all farms in the sample. To account for outliers, area cultivated was trimmed at three standard deviations above and below the mean for each farm size category (small, medium, large). Percentages, means, and medians are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control communities are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Because of the regression adjustment, these treatment-control differences may not be equal to the raw differences. Reported *p*-values are adjusted for clustering at the community level.

[a]*p*-Value from a Pearson chi-squared test for equivalence of the treatment and control distributions, adjusting for clustering at the community level.

*/**/***Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

ha = hectares.

D. Implications of differences between treatment and control communities

The analysis in this chapter suggests that the treatment and control samples were similar at baseline in terms of most household and farm characteristics. However, there were statistically significant differences in the education level and gender of the farm operator. Given the large number of characteristics that we considered, these differences are likely due to chance. Nevertheless, because these characteristics could be related to the outcomes of interest, we will control for the education level and gender of the farm operator in the ultimate impact analysis.

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III. AGRICULTURAL PRODUCTION, FARM PROFITS, AND HOUSEHOLD INCOME

In this chapter, we describe measures of agricultural production, farm profits, and household income in the 2012 agricultural season. These measures are among the key outcomes that value chain training is expected to affect in future agricultural seasons. It is therefore important both to document the baseline levels of these measures and to assess the extent to which random assignment resulted in similar baseline levels in the treatment and control groups. If the treatment and control groups are similar in these measures at baseline, any differences that are subsequently observed between the two groups can be attributed to the impact of value chain training and benchmarked against the baseline levels to determine the relative magnitude of the impact.

The value chain training is expected to most directly increase the production and quality of targeted crops by beneficiaries, resulting in increased sales volumes of these crops and higher prices (due to higher quality). The Farm Operator Survey therefore captured detailed information regarding the cultivation, harvest, and sales of specific crops—including the targeted crops in each community. It also collected information on other aspects of crop production and post-harvest practices of particular interest to the Millennium Challenge Account–Moldova and the Millennium Challenge Corporation. This information included the use of cold storage, which is expected to increase as a result of the finance activity. Increased use of cold storage would complement quality improvements by enabling farmers to receive higher prices for their (higher quality) produce due to off-season sales.

Increased revenues from targeted crops as a result of value chain training are ultimately intended to increase farm profits and overall household income for beneficiaries. To enable us to measure these outcomes, the Farm Operator Survey captured information on farm expenditures and nonfarm household income, in addition to the information on crop sales mentioned above. The survey also collected an alternative measure of well-being, household consumption. We expect our eventual impact analysis to focus on this measure, because the statistical power to detect changes in household income, which is more variable, is limited.[12] In addition, household income is more susceptible to year-to-year variation due to weather or economic conditions, whereas households are better able to smooth their consumption patterns over time; consumption might therefore be a better long-term measure of well-being (Deaton 1997). Table III.1 summarizes the key measures we analyzed related to production, farm profits, and household income. We will use similar measures in future rounds of the survey to assess the impacts of value chain training.

[12] We noted in our design report our concerns about limited statistical power to detect impacts on household income (Fortson et al. 2012). In Chapter IX, we reassess statistical power for the evaluation based on updated parameter estimates from the 2012–2013 Farm Operator Survey.

Table III.1. Measures of agricultural production, farm profits, and household income

Measures	Time frame
Agricultural production. Crops cultivated; area cultivated of targeted crops; percentage of cultivated area devoted to targeted crop; cultivated targeted crops intensively; irrigated targeted crops; amount harvested of targeted crops; value of targeted crops harvested; weather and pests affecting production.	2012 agricultural season
Agricultural sales. Amount of targeted crops sold; price per ton; characteristics of crop sales (including purchaser, where sold, product destination, and cooperation with other farmers in sales).	2012 agricultural season
Membership in farmer organizations. Membership in producer organizations, agricultural cooperatives, and savings and credit associations.	2012 agricultural season
Cold storage. Use of cold storage facilities; distance from cold storage facilities.	2012 agricultural season
Revenue from agricultural production. Value of targeted crops sold; value of crops sold.	2012 agricultural season
Farm expenditures. Amount spent on specific farm expenditures.	2012 agricultural season
Farm profits. Revenues minus farm expenditures.	2012 agricultural season
Nonfarm income. Income from the household head, spouse, and any grown children, from all sources other than work on the family farm (small/medium farms only).	Previous year
Total household income. Farm profits plus nonfarm income (small/medium farms only).	Previous year
Household consumption. Total household nonfarm expenditures plus value of harvested crops consumed by the household (small/medium farms only).	Previous year

A. Agricultural production and sales

1. Overall pattern of crop cultivation

We begin by describing the overall pattern of crop cultivation by farmers in the treatment and control samples. As we described in Chapter I, our sample consists of farmers who cultivated the specific crops that were targeted for value chain training in their community (targeted crops). However, some of these farmers may also have cultivated other crops—either nontargeted crops, or crops that were targeted by the trainings in other communities. Understanding the broader pattern of crop cultivation by farmers in the sample is therefore important to place into context our subsequent analysis of targeted crops.

Farmers in the treatment sample cultivated a variety of crop types, including both targeted and nontargeted crops (Table III.2).[13] Corn, a nontargeted crop, was the most commonly cultivated (47 percent of treatment sample farmers), followed by several targeted crops: tomatoes (33 percent), apples (29 percent), table grapes (28 percent), cucumbers (21 percent) and sweet peppers (18 percent). Of the remaining targeted crops, peaches (10 percent) and plums (6

[13] Because Table III.2 is intended to describe overall cultivation patterns of farmers in the sample, it records the cultivation of nontargeted crops and targeted crops, even in communities in which those crops were not targeted. For example, cultivation of plums in a community in which table grapes were targeted is recorded in Table III.2 under plum cultivation.

percent) were the most common; sweet cherries (3 percent), as well as walnuts, almonds, salad greens, and culinary herbs (all 1 percent or under) were the least common. Other common nontargeted crops in the treatment sample included sunflowers (18 percent), wine grapes (14 percent), and wheat (14 percent).

Table III.2. Crops cultivated (percentage of farms, targeted crops in bold)

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Crops most commonly cultivated						
Corn	902	563	46.9	42.0	4.0	0.51
Tomatoes	902	563	32.8	33.0	-2.0	0.74
Apples	902	563	29.2	25.8	3.3	0.57
Table grapes	902	563	27.8	21.8	7.5	0.25
Cucumbers	902	563	20.6	25.2	-6.6	0.14
Sweet peppers	902	563	18.2	19.2	-1.9	0.85
Sunflowers	902	563	17.6	12.8	5.0	0.28
Wine grapes	902	563	14.2	11.7	3.3	0.42
Wheat	902	563	13.9	19.5	-5.4	0.15
Cabbages	902	563	10.7	8.7	1.8	0.71
Peaches	902	563	10.3	17.3	-6.8	0.26
Soybeans	902	563	9.6	2.6	7.1	0.03**
Potatoes	902	563	7.5	7.7	-0.3	0.93
Other vegetables	902	563	6.9	4.0	2.5	0.43
Plums	902	563	6.0	12.4	-5.6	0.18
Barley	902	563	5.8	3.2	2.7	0.17
Watermelon	902	563	3.2	1.8	1.3	0.47
Sweet cherries	902	563	3.2	2.4	0.8	0.75
Other targeted crops cultivated						
Walnuts	902	563	1.4	2.8	-1.3	0.39
Salad greens	902	563	0.5	0.0	0.5	0.28
Almonds	902	563	0.2	0.0	0.3	0.19
Culinary herbs	902	563	0.2	0.0	0.2	0.12

Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table presents the percentage of all farms cultivating each crop. Nontargeted crops that were reported by a small percentage of treatment and control farms are omitted. All targeted crops are included, and are highlighted in bold. Cultivation of targeted crops includes cultivation in communities in which that crop was not targeted. Field cultivation of targeted vegetable crop types (tomatoes, cucumbers, sweet peppers, salad greens, and culinary herbs) is included, even though these crops were only targeted if cultivated in a greenhouse. Percentages are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control communities are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Because of the regression adjustment, these treatment-control differences may not be equal to the raw differences. Reported *p*-values are adjusted for clustering at the community level.

*/**/***Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

Crop patterns are generally similar in the treatment and control samples, especially in terms of the most commonly cultivated crops. The largest differences are in the prevalence of cultivation of some of the targeted crops, such as table grapes (more common in the treatment sample), cucumbers, peaches, and plums (all more common in the control sample). However, all of these differences are less than 8 percentage points in magnitude, and none is statistically significant.

2. Cultivation and sales of targeted crops

Having described overall cultivation patterns in our sample, we now focus specifically on the cultivation and sales of targeted crops, which were the focus of value chain training. For ease of exposition, we group targeted stone fruits (plums, peaches, and sweet cherries) and nuts (almonds and walnuts) together in the subsequent analysis.[14] We also group together all of the targeted vegetables (tomatoes, cucumbers, sweet peppers, salad greens, and culinary herbs).[15]

We begin by examining the distribution of the sample across various targeted crops (Table III.3). The key difference from the analysis in Table III.2 is that we include cultivation of targeted crop types only in communities in which they were targeted; these farmers are the most likely direct recipients (or potential recipients) of the value chain trainings. About 16 percent of the treatment sample cultivated targeted stone fruits or nuts (that is, cultivated plums, peaches, sweet cherries, or nuts in communities in which the relevant crop was targeted), 22 percent cultivated targeted apples, 26 percent cultivated targeted table grapes, and 39 percent cultivated targeted vegetables.

The differences between the treatment and control samples reflect some of the differences in overall cultivation described above, but some are larger in magnitude. For example, farmers in the treatment sample are 9 percentage points more likely to cultivate targeted table grapes and 11 percentage points less likely to cultivate targeted vegetables relative to the control sample, although none of the differences is statistically significant. The primary cause of these differences was substantial variation in the number of farmers per community cultivating specific targeted crops. Random assignment sometimes led—by chance—to an imbalance in the number of eligible farmers in the treatment and control groups; as a result, there are sometimes large differences in cultivation of targeted crops.

[14] As Table III.2 shows, there were relatively few farmers in the sample cultivating sweet cherries and nuts. Therefore, this group consists predominantly of farmers cultivating targeted peaches and plums.

[15] Although the value chain trainings target producers who cultivate vegetables in a greenhouse, our analysis generally includes field cultivation for any targeted vegetable crop that was *partially* grown in a greenhouse. For example, if a farmer in a targeted vegetable community cultivated cucumbers in a greenhouse and in the field, but tomatoes in a field only, we included all cucumber cultivation in the analysis but not the tomato cultivation. The inclusion of partial field cultivation was both because some of the variables we analyzed (such as sales) were not separated by greenhouse or field cultivation, and because some training practices relevant to greenhouse cultivation could also be applied to field cultivation of a given targeted crop.

Table III.3. Cultivation and sales of targeted crops (percentage of farms)

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Cultivated targeted crops, all farms						
Stone fruits or nuts	902	563	16.0	22.8	-5.8	0.44
Apples	902	563	22.3	18.1	4.8	0.30
Table grapes	902	563	26.0	18.0	9.5	0.14
Vegetables	902	562	38.8	47.0	-10.9	0.13
Sold targeted crops, all farms						
Stone fruits or nuts	901	562	9.8	13.6	-3.3	0.54
Apples	902	563	15.1	16.9	-1.4	0.83
Table grapes	900	563	24.5	9.4	16.4	0.03**
Vegetables	895	561	38.2	47.0	-11.0	0.13
Sold targeted crops, among those cultivating						
Stone fruits or nuts	140	176	61.7	60.3	-7.6	0.48
Apples	200	178	67.6	93.5	-29.1	0.12
Table grapes	226	166	94.8	52.0	41.7	0.02**
Vegetables	346	89	99.8	100.0	-0.2	0.38

Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table presents the percentage of farms cultivating and selling each targeted crop. Stone fruits or nuts include peaches, plums, sweet cherries, almonds, and walnuts. Vegetables include tomatoes, cucumbers, sweet peppers, salad greens, and culinary herbs that were at least partially grown in a greenhouse. Cultivation and sales of targeted crops includes cultivation and sales only in communities in which a given crop was targeted. Farms that cultivated multiple targeted crops may appear in multiple rows in each panel. Percentages are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control communities are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Because of the regression adjustment, these treatment-control differences may not be equal to the raw differences. Reported *p*-values are adjusted for clustering at the community level.

*/**/***Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

Most farmers who cultivated targeted table grapes and vegetables also sold those crops; for targeted apples and targeted stone fruits and nuts, a smaller share of farmers sold the targeted crop. Specifically, about 38 percent of treatment sample farmers cultivating targeted stone fruits and nuts reported no sales of these crops, as did 32 percent of those cultivating targeted apples. This finding is largely driven by many farmers cultivating these crops reporting zero harvest, especially for targeted plums (not shown). Small harvests could reflect the fact that orchards do not produce every year, particularly if they are young orchards.

To further explore the cultivation of targeted crops, we examined more detailed measures of cultivation (Table III.4).[16] In the treatment sample, the mean area devoted to cultivation of targeted crops amongst those cultivating these crops is about 18 hectares for targeted stone fruits and nuts, 12 hectares for targeted apples, and 4 hectares for targeted table grapes. The mean area of targeted vegetable cultivation is much smaller, less than 0.1 hectares, simply because our definition of targeted vegetables requires them to be cultivated (at least partially) in greenhouses, which are relatively small. The mean areas cultivated are similar in the control sample, with the exception of targeted stone fruits and nuts, for which the mean cultivated area is substantially larger in the treatment sample (an adjusted difference of 18 hectares, albeit not statistically significant).

The median area cultivated, however, was substantially smaller than the mean. In the treatment sample, the median area cultivated was about 1.3 hectares for stone fruits and nuts, 1.0 hectares for apples, and 0.9 hectares for table grapes (not shown), reflecting the high prevalence of small-scale farmers in the sample. In contrast to the difference in mean area, the median area of stone fruits and nuts cultivated was very similar in the control sample (not shown).

Even among targeted farmers, nontargeted crops generally compose a substantial share of cultivated land area. In the treatment sample, targeted stone fruits and nuts, apples, or table grapes cover about half of the cultivated area for the average farmer of these crops, while targeted vegetables cover only one-fifth of the cultivated area, on average. This finding suggests that cultivation of crops that are not directly targeted by the value chain training in a given community is an important component of cultivation (and potentially income) in the sample. These percentages are similar in the treatment and control sample with the exception of targeted apples, which cover 73 percent of cultivated area in farms in the control sample, on average, compared with 48 percent in the treatment sample.

We also captured information on other relevant dimensions of production, including "intensive" cultivation of targeted orchard crops and irrigation of targeted crops (Table III.4). Only a small percentage of farmers in the treatment or control samples cultivated targeted crops intensively (defined as orchards with a tree density of more than 1,000 trees per hectare) at baseline.

[16] In Table III.4 and the subsequent analysis presented by targeted crop group, we focus primarily on measures that are conditional on cultivating (or, where relevant, selling) a certain targeted crop. We believe that these conditional measures will be more programmatically informative than the unconditional measures for the full sample. However, the differences between the treatment and control samples in the percentage of farmers cultivating and selling specific targeted crops suggest some caution in interpreting these conditional results. Specifically, some of the observed differences between the treatment and control samples in these conditional measures might be due to different characteristics of farmers cultivating or selling these crops in the two samples. In addition, the conditional measures have smaller sample sizes than the unconditional measures, which limits the statistical power to detect differences between the treatment and control samples.

Table III.4. Area cultivated, intensive cultivation, and irrigation of targeted crops

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Area cultivated of targeted crops (mean among those cultivating targeted crop, hectares)						
Stone fruits or nuts	141	175	17.7	5.4	17.7	0.17
Apples	198	178	12.3	12.1	1.4	0.87
Table grapes	228	163	4.2	4.9	0.0	0.99
Vegetables	351	90	0.1	0.4	-0.1	0.32
Percentage of cultivated area devoted to targeted crop (mean among those cultivating targeted crop, percentage)						
Stone fruits or nuts	140	171	48.4	36.0	5.8	0.45
Apples	196	178	47.9	72.6	-32.8	0.05*
Table grapes	228	161	56.2	66.8	-12.1	0.36
Vegetables	349	88	17.0	20.5	5.3	0.35
Cultivated targeted crops intensively (percentage of farms cultivating targeted crop)						
Stone fruits or nuts	134	142	0.0	3.1	-2.8	0.14
Apples	189	174	8.8	4.3	4.4	0.41
Irrigated targeted crops (percentage of farms cultivating targeted crop)						
Stone fruits or nuts	141	176	7.3	0.0	7.4	0.34
Apples	198	178	1.2	1.5	-0.3	0.89
Table grapes	228	164	0.6	7.1	-6.4	0.20
Vegetables	353	90	92.3	76.1	1.4	0.66

Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table describes area cultivated, intensive cultivation, and irrigation of targeted crops, among those farms cultivating a given crop in a community in which that crop was targeted. Stone fruits or nuts include peaches, plums, sweet cherries, almonds, and walnuts. Vegetables include tomatoes, cucumbers, sweet peppers, salad greens, and culinary herbs that were at least partially grown in a greenhouse. Intensive cultivation is defined as an orchard with a tree density of 1,000 trees per hectare or greater, and is not applicable to table grape or vegetable cultivation. Farms that cultivated multiple targeted crops may appear in multiple rows in each panel. To account for outliers, area cultivated was trimmed at three standard deviations above and below the mean for each farm size category (small, medium, large). Percentages and means are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control communities are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Because of the regression adjustment, these treatment-control differences may not be equal to the raw differences. Reported *p*-values are adjusted for clustering at the community level.

*/**/***Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

In addition, few farmers irrigated their targeted crops—with the exception of targeted vegetable crops, which were irrigated by more than 90 percent of targeted vegetable farmers in the treatment sample. In the treatment communities that are part of centralized irrigation systems that have been selected for water management transfer and irrigation system rehabilitation, improvements in irrigation for other targeted crops could be observed once the systems are rehabilitated, perhaps complementing improvements in production and sales through the value chain trainings. However, because of the limited overlap between the farmers served by value chain training and irrigation, we might not observe large increases in irrigation in the full sample even after rehabilitation.

3. Crop sales, harvests, and revenues

To complement our analysis of cultivation and sales, we examined the volume of targeted crops harvested and sold, and the values of these harvests and sales (that is, revenues), among those cultivating them (Table III.5). For completeness, we present the amounts harvested and sold in metric tons; however, our focus is on harvest value (amount harvested in tons multiplied by the value per ton) and revenue in dollars, because these monetary measures are more directly comparable across different crops than weight measures.[17,18] Because a key goal of the value chain training is to increase prices received for targeted crops (through improved quality), we also explicitly document prices per metric ton—although, again, these measures may not be comparable across different crops.

Among targeted crops, apples had the highest average revenues in the treatment sample ($39,478). Although prices were lower for targeted apples (about $236 per ton) compared with other targeted crops (between $425 and $634 per ton), the amounts harvested and sold were substantially higher. Median revenues for all targeted crops in the treatment sample were substantially lower than mean revenues—$505 for stone fruits and nuts, $505 for apples, $1,684 for table grapes, and $1,263 for vegetables (not shown). These lower median revenues are driven primarily by the high prevalence of small-scale farmers in the sample and, for targeted stone fruits and nuts and targeted apples, by the prevalence of farms with zero harvests.[19]

Some of the regression-adjusted differences in harvest values and revenues between the treatment and control groups were relatively large, especially for targeted stone fruits and nuts and targeted apples. However, these differences were not statistically significant because of high variability in these amounts. The regression-adjusted differences in prices were relatively small and statistically insignificant, with the exception of targeted apples, for which the price was $92 per ton (about 60 percent) higher in the treatment sample.

[17] Most monetary amounts in the Farm Operator Survey were reported in Moldovan lei but were converted into U.S. dollars using the average exchange rate in 2012 (the year for which these values were reported), which was 0.08418 dollars per lei (www.oanda.com).

[18] We encountered some challenges in measuring harvest values and agricultural revenues. First, farmers were asked to report both the amount sold (in tons) and revenue (in Moldovan lei) for each crop, but in practice they sometimes reported only one or the other. This variability made it difficult to determine revenues (in cases in which only tons were reported) and harvest values (because we required both amount sold and revenue to compute a per-ton price to calculate harvest value). Second, some farmers reported a harvest but no sales of a given crop, so that again we could not compute a per-ton price to compute their harvest value. To address these issues, we imputed missing farmer-level per-ton prices for each harvested crop using the raion-level median price for that crop. Where fewer than five farmers in the raion sold a particular crop and the imputed prices would thus have been imprecise, we imputed prices using the median in the entire region—north, center, or south (provided there were at least five farmers selling that crop); failing that, we imputed prices using the median in the entire sample.

[19] Median harvest values in the treatment sample were similarly lower than their respective means—the medians were $505 for targeted stone fruits and nuts, $758 for targeted apples, $1,818 for targeted table grapes, and $1,347 for targeted vegetables (not shown).

Table III.5. Agricultural harvest, sales volume, prices, revenue, and production value

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Average amount harvested (mean, metric tons)						
Stone fruits or nuts	141	176	37.82	15.11	44.49	0.27
Apples	200	178	137.16	105.78	60.59	0.50
Table grapes	228	166	19.05	21.20	1.63	0.92
Vegetables	342	88	4.58	9.15	-2.06	0.56
Average amount sold (mean, metric tons)						
Stone fruits or nuts	140	176	21.75	14.72	18.37	0.47
Apples	200	178	123.51	92.59	59.77	0.49
Table grapes	226	166	18.58	20.89	1.44	0.93
Vegetables	342	89	4.50	9.16	-2.10	0.55
Average price per ton (mean, dollars)						
Stone fruits or nuts	88	69	634	542	-2	0.97
Apples	136	161	236	159	92	0.00***
Table grapes	213	110	425	431	17	0.74
Vegetables	339	88	550	503	60	0.45
Average agricultural revenue (mean, dollars)						
Stone fruits or nuts	140	171	11,857	6,486	10,551	0.45
Apples	199	177	39,478	16,202	34,520	0.23
Table grapes	226	166	8,538	8,594	1,673	0.81
Vegetables	341	88	2,161	3,318	-330	0.78
Average harvest value (mean, dollars)						
Stone fruits or nuts	141	176	17,458	6,596	19,177	0.30
Apples	200	178	45,127	18,280	39,589	0.17
Table grapes	228	166	8,584	8,714	1,572	0.82
Vegetables	342	88	2,193	3,316	-318	0.78

Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table presents measures of average harvest, sales volume, prices, revenue, and production value of targeted crops, among those farms cultivating a given crop in a community in which that crop was targeted. Stone fruits or nuts include peaches, plums, sweet cherries, almonds, and walnuts. Vegetables include tomatoes, cucumbers, sweet peppers, salad greens, and culinary herbs that were at least partially grown in a greenhouse. Farms that cultivated multiple targeted crops may appear in multiple rows in each panel. Revenues were converted from Moldovan lei to U.S. dollars using the average exchange rate in 2012, which was 0.08418 dollars per lei (www.oanda.com). To account for outliers, all variables were trimmed at three standard deviations above and below the mean for each farm size category (small, medium, large). Means are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control communities are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Because of the regression adjustment, these treatment-control differences may not be equal to the raw differences. Reported *p*-values are adjusted for clustering at the community level.

*/**/***Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

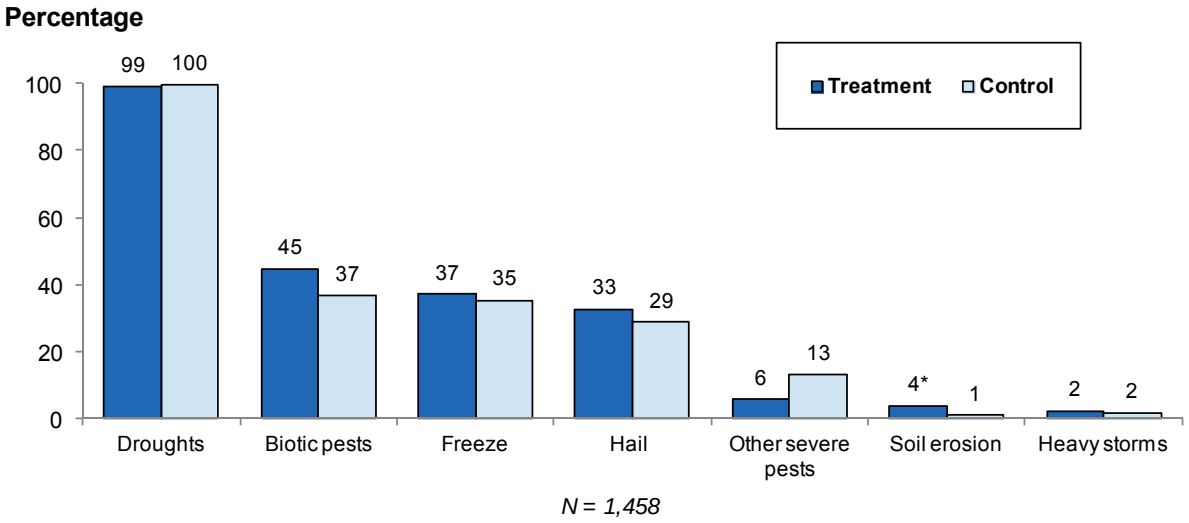
B. Other dimensions of agricultural production and sales

In addition to describing the overall pattern of crop production and sales, we also examined specific dimensions of the production and sales process that might be related to the outcomes of interest or are of particular interest to the Millennium Challenge Account–Moldova and the Millennium Challenge Corporation.

1. Weather and pests

To understand other factors that might have affected agricultural production, we asked farmers about pests and weather conditions that they experienced in the 2012 agricultural season (Figure III.1). The key finding—consistent with the qualitative report findings—is that a severe drought affected almost all farmers in the sample. This finding suggests that farm production and sales in this year may have been lower than in a typical year. As a result, some caution is warranted in interpreting the results in this report: the mean levels reported may be atypical, and the similarity between the treatment and control samples could differ from that of a typical year. Farmers also experienced several other adverse conditions, including biotic pests (45 percent in the treatment sample), freezes (37 percent), and hail (33 percent). These conditions were similar in the treatment and control samples, with small differences that were not statistically significant.

Figure III.1. Weather and pests (percentage of farms)



Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Figure presents percentage of farmers experiencing specific weather and pests in the 2012 agricultural season. Percentages may not sum to 100, because respondents could select more than one category. Percentages are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control communities are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Statistical significance of differences is based on *p*-values that are adjusted for clustering at the community level.

*/**/***Adjusted treatment-control difference significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

2. Characteristics of sales

To further explore sales, we analyzed where and to whom farmers sold targeted crops (Table III.6).[20] Among farmers who sold targeted crops, most sold some of their produce directly to traders/intermediaries (65 percent in the treatment sample) or directly to the end consumer (41 percent); relatively few sold produce to retailers (10 percent) or processors (9 percent). Most farmers in the treatment sample sold some of their produce of targeted crops directly from the farm or roadside (54 percent), but a substantial percentage also sold in regional markets (26 percent) and in local markets (19 percent in formal and 16 percent in informal local markets). Relatively few treatment farmers (9 percent) had any of their production of targeted crops exported (the broader Growing High-Value Agriculture Sales Activity intends to increase product quality and competitiveness, which could be reflected in increased exports if export markets are more profitable than local markets).[21] The pattern of sales is generally similar in the treatment and control groups. However, sales to traders/intermediaries are significantly more common in the treatment sample, as are exports (though still less than 10 percent of farms), while sales in local informal markets are significantly less common. About 58 percent of farmers who sold targeted crops reported cooperating with others to market and sell any of these crops; this percentage is similar in the control sample.

Table III.6. Characteristics of agricultural sales (percentage of farms selling targeted crops)

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Buyer						
Trader/intermediary	724	338	64.9	47.0	18.9	0.01**
End consumer (direct)	724	337	40.6	44.3	-4.7	0.50
Retailer	723	337	9.6	12.6	-3.4	0.63
Processor	722	337	9.0	3.9	3.6	0.33
Cooperative (marketing)	722	337	0.5	0.9	-0.5	0.63
Other	721	337	0.7	2.4	-1.3	0.45
Point of sale						
Farm gate/roadside	739	388	53.8	37.8	15.4	0.13
Regional market	740	388	25.7	22.3	4.6	0.69
Local market (formal)	739	388	18.9	14.6	4.0	0.52
Local market (informal)	739	388	16.1	41.7	-26.1	0.00***
Other market	740	388	6.5	1.6	4.9	0.22
Product destination						
Local market	718	356	91.9	99.2	-9.4	0.05**
Export	717	354	9.3	1.9	9.5	0.04**
Cooperated with other farmers to market and sell crops	891	557	58.1	47.8	10.5	0.34

Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table presents characteristics of sales for targeted crops, among farms selling targeted crops in communities in which those crops were targeted. Percentages may sum to more than 100, because some farmers gave multiple responses. Percentages are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control communities are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Because of the regression adjustment, these treatment-control differences may not be equal to the raw differences. Reported *p*-values are adjusted for clustering at the community level.

*/**/***Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

[20] The survey gathered information on sales for each crop sold, but for conciseness, we focus on sales of any targeted crop.

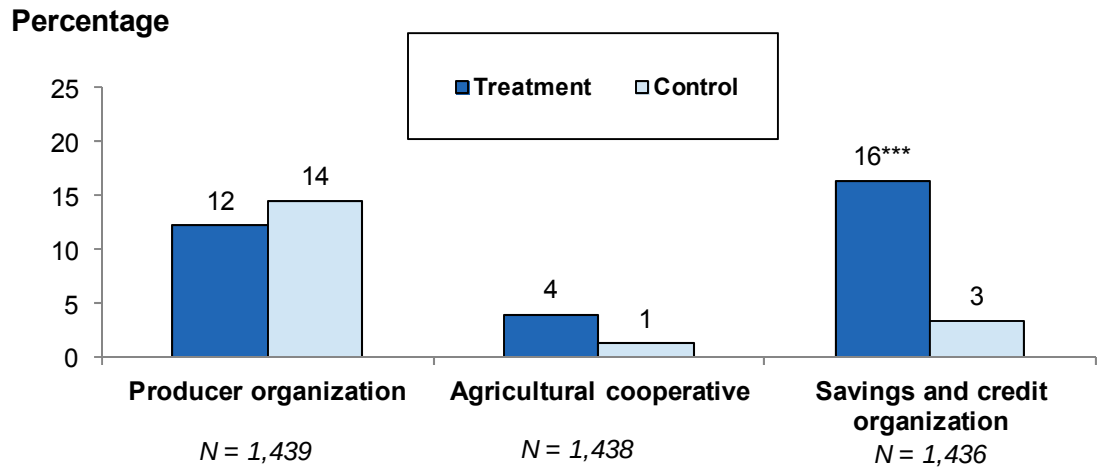
[21] These crops could be exported directly; for smaller farmers, they are more likely exported by the buyer. Because some farmers might not be certain of the destination of their products, this measure could be subject to reporting error.

3. Membership in farmer organizations

To provide some context about formal interaction and cooperation among farmers (in addition to the broader cooperation in marketing and sales described above), the Farm Operator Survey also asked farmers about their membership in various farmer organizations. This information could be important both in sharing data about new practices and in translating improvements in production and quality of targeted crops into increased revenues.

Membership in farmer organizations at baseline is very limited (Figure III.2). Only 12 percent of treatment farmers are members of producer organizations, 4 percent are members of agricultural cooperatives, and 16 percent are members of savings and credit associations. Membership in these organizations in the control sample is also low—for savings and credit associations, it is only 3 percent, significantly lower than in the treatment sample.

Figure III.2. Membership of farmer organizations (percentage of farms)



Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Figure presents membership in various farmer organizations. Percentages are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control communities are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Statistical significance of differences is based on *p*-values that are adjusted for clustering at the community level.

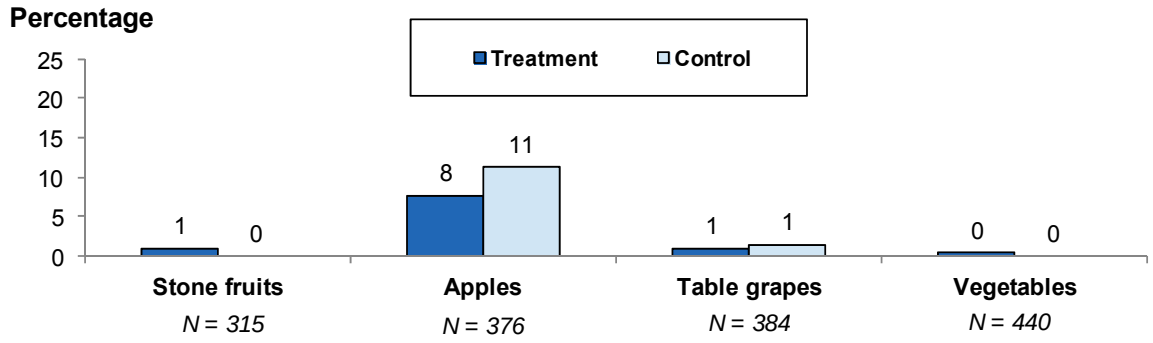
*/**/***Adjusted treatment-control difference significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

4. Cold storage

Cold storage is an important post-harvest practice through which farmers can increase the revenues from sales of certain targeted crops by selling them off-season, when prices are typically higher. The finance activity has a particular emphasis on funding investments in post-harvest infrastructure, including cold storage, and could complement the improvements in quality through the value chain training. We therefore describe the pattern of cold storage access and use to help inform the design of this program and to better understand the scope for improved interactions between cold storage and value chain training.

The use of cold storage for targeted crops harvested in the 2012 season was very limited. Only 1 percent or less of farmers in the treatment and control samples reported storing any of their targeted stone fruit, table grapes, or vegetables in cold storage in the 2012 agricultural season (Figure III.3).[22] Cold storage of targeted apples was more common (8 percent of targeted apple farmers in the treatment sample and 11 percent in the control sample used cold storage). These usage rates are low despite the fact that about 60 percent of treatment farmers reported that they knew of a cold storage facility within 5 kilometers of their farm (Figure III.4). A similar percentage of farmers in the control sample knew of a nearby cold storage facility (within 5 kilometers). However, for farmers that did not know of a nearby facility, control farmers were more likely to report that the nearest cold storage facility is very far away (more than 15 kilometers) relative to the treatment sample. Although we cannot explore the reasons for the limited use of cold storage using the survey data, results from the qualitative study suggest that it could be driven by factors such as small harvests of targeted crops; high transport and storage costs; and uncertainty regarding the price that will be received in the future for stored crops (ACT Research 2013).

Figure III.3. Use of cold storage (percentage of farms)



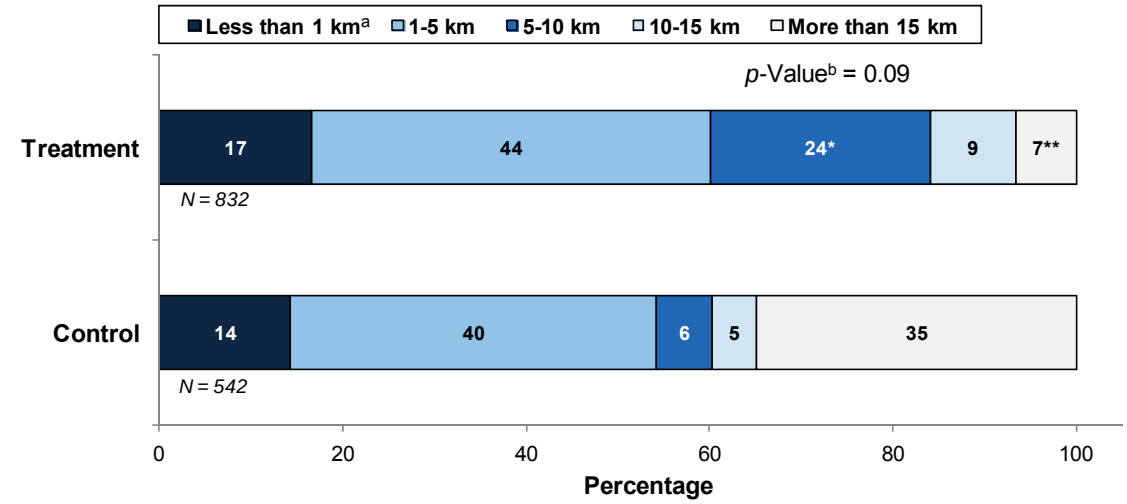
Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Figure presents percentage of farms that used cold storage in the 2012 agricultural season, among those farms harvesting targeted crops in communities in which those crops were targeted. Stone fruits include peaches, plums, and sweet cherries. Vegetables include tomatoes, cucumbers, sweet peppers, salad greens, and culinary herbs that were at least partially grown in a greenhouse. Percentages are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control communities are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Statistical significance of differences is based on *p*-values that are adjusted for clustering at the community level.

*/**/***Adjusted treatment-control difference significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

[22] We excluded targeted nuts from this analysis, because cold storage is not relevant for nuts. We included all other targeted crops for completeness, though the length of time each crop can be kept in cold storage (and hence the potential advantages of off-season sales) varies substantially. Of all the targeted crops, only apples are can be stored for several months; others can typically be stored for several weeks at most.

Figure III.4. Distance to cold storage (percentage of farms)



Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Figure presents distance from the nearest cold storage facility, which was reported in the categories indicated. Percentages are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control communities are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Statistical significance of differences is based on *p*-values that are adjusted for clustering at the community level.

[a] Distance categories reflect the response categories available to respondents in the survey

[b] *p*-Value from a Pearson chi-squared test for equivalence of the treatment and control distributions, adjusting for clustering at the community level

*/**/***Adjusted treatment-control difference significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

km = kilometer.

C. Farm profits and household income

To measure farm profits, we computed revenues from crop sales (including revenues from targeted crops reported in Table III.5 and all other crops) and subtracted reported expenditures on various farm inputs. Mean revenues in the treatment sample across all crops were $36,704 with a median of $2,222, and were similar in the control sample (Table III.7).

In keeping with the earlier findings that crops that were not targeted in a given community composed a substantial fraction of cultivated area, nontargeted crops also composed a substantial fraction of revenues. Specifically, targeted crops composed only about 64 percent of the farm revenues of the average farmer in the treatment sample (not shown). Targeted grapes made the largest contribution to revenues (79 percent of revenues, on average, among targeted table grape farmers), and targeted stone fruits and nuts and targeted apples the lowest (about 50 percent of revenues, on average, among targeted stone fruit and nut and targeted apple farmers).

Table III.7. Farm revenues (percentage of farms unless otherwise indicated)

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Farm revenues	866	547				0.67 [a]
≤$0			6.3	12.1	-5.3	0.30
>$0–<$500			9.4	6.9	3.0	0.45
≥$500–<$1,000			10.8	11.0	-0.3	0.94
≥$1,000–<$2,500			26.2	19.9	5.9	0.18
≥$2,500–<$5,000			20.7	16.9	3.6	0.51
≥$5,000			26.7	33.3	-6.8	0.30
Median (dollars)			2,222	2,525	--	--
Mean (dollars)			36,704	30,528	6,260	0.73

Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table presents annual farm revenues by farm. Revenues were converted from Moldovan lei to U.S. dollars using the average exchange rate in 2012, which was 0.08418 dollars per lei (www.oanda.com). To account for outliers, revenues were trimmed at three standard deviations above and below the mean for each farm size category (small, medium, large). Percentages, means, and medians are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control communities are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Because of the regression adjustment, these treatment-control differences may not be equal to the raw differences. Reported *p*-values are adjusted for clustering at the community level.

[a] *p*-Value from a Pearson chi-squared test for equivalence of the treatment and control distributions, adjusting for clustering at the community level.

*/**/***Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

We computed total farm expenditures by summing various categories of expenditures. The highest mean expenditures on farm inputs in the treatment sample (Table III.8) were chemicals (a mean of $5,840 per farm), hired labor ($5,021), agricultural equipment purchases ($3,593), seeds and seedlings ($3,563), and equipment rentals and tools ($3,438).[23] Total mean expenditure on farm inputs in 2012 was about $32,273 in the treatment sample, and was similar in the control sample. Median expenditures in both treatment and control samples were much lower, about $1,187 and $1,104 respectively, because the means were strongly affected by high expenditures for the few large and medium farms in the sample.

[23] Respondents were sometimes unable to distinguish between expenditures on hired labor and equipment rentals, because these goods and services often came bundled (for example, if a farm hired a tractor and a tractor operator). Therefore, the reported expenditures on equipment rentals versus hired labor should be interpreted with caution.

Table III.8. Farm expenditures (dollars)

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Individual farm expenditures (mean)						
Chemicals[a]	896	560	5,840	3,596	2,310	0.38
Hired labor	896	561	5,021	3,896	1,171	0.65
Equipment purchase	902	562	3,593	2,241	1,433	0.56
Seeds or seedlings	897	563	3,563	2,635	995	0.59
Equipment rentals/tools	900	562	3,438	3,270	251	0.90
Mineral fertilizers	899	561	2,662	1,679	1,030	0.44
Agricultural loan principal and interest repayments	902	563	2,365	3,266	-849	0.72
Rental payments for agricultural land	902	562	1,853	1,651	227	0.86
Taxes related to agricultural production and sales	902	563	478	828	-339	0.63
Agricultural land taxes	902	562	435	523	-79	0.74
Costs associated with bringing product to market[b]	897	562	416	213	203	0.18
Other storage for farm production	901	563	234	61	177	0.24
Irrigation costs	900	560	206	235	-31	0.83
Cold storage construction and maintenance	901	563	151	840	-679	0.18
Agricultural land purchases	902	563	151	61	92	0.42
Equipment for drip irrigation	902	562	108	155	-51	0.55
Other major farming expenditures	900	560	1,262	1,805	-518	0.63
All farm expenditures	891	558				
Mean			32,273	28,415	3,982	0.81
Median			1,187	1,104	--	--

Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table presents mean annual farm expenditures by expenditure category. "Other major farming expenditures" combines categories with small expenditures, including equipment for drip irrigation, equipment for sprinklers, other irrigation costs, greenhouses, cold storage rental payments, organic fertilizers, and other physical/infrastructure improvements for the farm. Expenditures were converted from Moldovan lei to U.S. dollars using the average exchange rate in 2012, which was 0.08418 dollars per lei (www.oanda.com). To account for outliers, individual expenditures and total expenditures were trimmed at three standard deviations above and below the mean for each farm size category (small, medium, large). Means and medians are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control communities are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Because of the regression adjustment, these treatment-control differences may not be equal to the raw differences. Reported *p*-values are adjusted for clustering at the community level.

[a] Chemicals include herbicides, fungicides, insecticides, and other chemicals.

[b] Costs associated with bringing product to market include sorting, packaging, transportation, marketing, etc.

*/**/***Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

Subtracting total expenditures from total revenues for each farm results in mean annual profits of approximately $3,216 in the treatment sample (Table III.9). The control sample had *negative* mean profits (that is, losses) of $716, but this was not statistically significantly different from profits in the treatment sample. The distribution of profits suggests that that more than one-quarter of treatment sample farmers (and an even larger fraction of control sample farmers) had zero or negative profits. The prevalence of negative profits is likely related to the 2012 drought conditions, which, as mentioned above, may have led to small harvests. As with revenues and expenditures, median profits were substantially smaller in magnitude than mean profits in the treatment sample ($835), reflecting the substantial influence of the few large farms in the sample.[24]

Table III.9. Farm profits (percentage of farms unless otherwise indicated)

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Farm profits	861	545				0.67 [a]
≤$0			28.0	36.2	-7.1	0.33
>$0–<$250			7.5	8.1	-0.6	0.88
≥$250–<$500			7.4	4.0	3.3	0.05*
≥$500–<$1,000			11.0	12.4	-1.7	0.51
≥$1,000–<$2,500			20.7	15.4	5.0	0.18
≥$2,500			25.4	23.8	1.2	0.87
Median (dollars)			835	566	--	--
Mean (dollars)			3,216	-716	3,749	0.71

Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table presents annual farm profits. Profits were computed as total farm revenues minus total farm expenditures. Profits were converted from Moldovan lei to U.S. dollars using the average exchange rate in 2012, which was 0.08418 dollars per lei (www.oanda.com). To account for outliers, profits were trimmed at three standard deviations above and below the mean for each farm size category (small, medium, large). Percentages, means, and medians are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control communities are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Because of the regression adjustment, these treatment-control differences may not be equal to the raw differences. Reported *p*-values are adjusted for clustering at the community level.

[a] *p*-Value from a Pearson chi-squared test for equivalence of the treatment and control distributions, adjusting for clustering at the community level.

*/**/***Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

Although farm profits are likely to be more directly affected than household income, the ultimate goal of the value chain training (in conjunction with the other components of the Transition to High-Value Agriculture Project) is to increase household income. Even if farm profits were to increase, it is important to determine whether the net income of the household is

[24] Our measure of farm profits includes both operating expenses (such as seeds and fertilizer) as well as longer-term investments (such as equipment purchases or cold storage construction). Although these investments should average out across farmers in steady state, they may provide a misleading view of profits if long-term investments are being affected by the GHS activity or other THVA project components. We therefore computed an alternative measure of farm profits that defined as revenues minus operating expenses (not shown). Mean profits were substantially higher using this alternative measure ($9,610 in treatment and $8,541 in control), although the adjusted treatment-control difference was still not statistically significant and was even smaller in magnitude than before ($820). Median profits were less affected by the alternative measure, increasing slightly to $1,035 in treatment and $901 in control.

increasing or households are just substituting agriculture for other income sources. Therefore, we combined farm profits with employment income and other sources of nonfarm income to compute overall household income. Because large farms were usually operated as businesses rather than household enterprises, these measures are applicable only to small and medium farms. Small and medium farms had substantially lower mean profits ($860 in the treatment sample) compared with the full sample (Table III.10). The sources of nonfarm income with the highest means in the treatment sample of small and medium farms were other work in the agricultural sector (a mean of $1,043 per farm in the treatment sample), public sector employment ($834), and pensions ($445) (Table III.10).[25] Mean total nonfarm income was $3,402 in the treatment sample; combined with farm profits, these sources resulted in a total mean household income of about $4,366 in the treatment sample of small and medium farms. Mean household income in the control sample was about half that of the treatment sample (a regression-adjusted difference of $1,937), but the difference was not statistically significant.

[25] Interviewers noted the respondents were sometimes reluctant to report income figures; therefore some of these figures may be underreported.

Table III.10. Household income (percentage of small and medium farms unless otherwise indicated)

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Farm profits	835	527				0.66 [a]
≤$0			27.4	36.1	-7.5	0.32
>$0–<$250			7.9	8.5	-0.6	0.88
≥$250–<$500			7.7	4.2	3.4	0.05**
≥$500–<$1,000			11.5	13.0	-1.8	0.52
≥$1,000–<$2,500			21.7	16.0	5.2	0.17
≥$2,500			23.9	22.2	1.2	0.87
Mean (dollars)			860	-503	1,283	0.28
Median (dollars)			817	566	--	--
Nonfarm income (mean, dollars)	874	543				
Work in agricultural sector			1,043	1,052	-4	0.99
Work in public nonagricultural sector			834	578	252	0.07*
Pensions			445	372	74	0.50
Work in private nonagricultural sector			128	257	-135	0.03**
Entrepreneurship, handicraft, freelance activity			108	83	24	0.44
Remittances			76	33	44	0.24
Other sources of income			557	394	171	0.18
Total nonfarm income	874	543				0.22 [a]
$0–<$1,000			19.3	29.2	-9.8	0.13
≥$1,000–<$2,500			27.6	27.1	0.6	0.88
≥$2,500–<$5,000			30.5	23.7	6.7	0.07*
≥$5,000			22.6	19.9	2.6	0.60
Mean (dollars)			3,402	2,970	432	0.27
Median (dollars)			2,525	2,065	--	--
Total household income	835	527				0.30 [a]
≤$0			7.2	13.0	-5.7	0.03**
>$0–<$1000			6.9	10.3	-2.9	0.26
≥$1,000–<$2,500			19.1	21.2	-1.7	0.71
≥$2,500–<$5,000			29.8	26.8	2.6	0.46
≥$5,000			37.0	28.7	7.8	0.30
Mean (dollars)			4,366	2,337	1,937	0.11
Median (dollars)			3,770	2,907	--	--

Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table presents annual farm profits, nonfarm income by category, and total household income for small and medium farms. Household income is computed as the sum of farm profits and nonfarm income. Categories with small nonfarm incomes were combined into "other sources of income." These sources include scholarships, social payments, support, and income from land rental. The table excludes large farms; because they operate as businesses, household income is not relevant. Incomes were converted from Moldovan lei to U.S. dollars using the average exchange rate in 2012, which was 0.08418 dollars per lei (www.oanda.com). To account for outliers, profits and income measures were trimmed at three standard deviations above and below the mean for each farm size category (small or medium). Percentages, means, and medians are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control communities are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Because of the regression adjustment, these treatment-control differences may not be equal to the raw differences. Reported *p*-values are adjusted for clustering at the community level.

[a]*p*-Value from a Pearson chi-squared test for equivalence of the treatment and control distributions, adjusting for clustering at the community level.

*/**/***Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

Finally, we examined reported household consumption as an alternate measure of household well-being, again restricted to small and medium farms for which these measures were relevant (Table III.11). Total consumption consists of the estimated value of consumption out of production (mean of about $705 in the treatment sample) and all other nonfarm expenditures (mean of about $2,601 in the treatment sample). Mean total consumption was around $3,384 in the treatment sample, comparable to total household income, and was slightly lower in the control sample.

Table III.11. Annual household consumption (percentage of small and medium farms unless otherwise indicated)

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Annual value of consumption out of agricultural production (dollars)						
Mean	676	459	705	696	1	1.00
Median			421	505	--	--
Annual consumption expenditure (dollars)						
Mean	720	476	2,601	2,136	452	0.13
Median			2,105	1,317	--	--
Total annual consumption	661	457				0.43 [a]
<$1,000			8.3	11.6	-3.0	0.59
≥$1,000–<$2,500			34.8	46.0	-10.3	0.24
≥$2,500–<$5,000			38.2	30.5	7.0	0.27
≥$5,000			18.6	11.9	6.3	0.12
Mean (dollars)			3,384	2,880	456	0.18
Median (dollars)			2,778	2,105	--	--

Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table presents the value of annual household consumption for small and medium farms. Total consumption is computed as the sum of consumption expenditure and the value of consumption out of production. The table excludes large farms; because they operate as businesses, household consumption is not relevant. Consumption values were converted from Moldovan lei to U.S. dollars using the average exchange rate in 2012, which was 0.08418 dollars per lei (www.oanda.com). To account for outliers, consumption measures were trimmed at three standard deviations above and below the mean for each farm size category (small or medium). Percentages, means, and medians are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control communities are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Because of the regression adjustment, these treatment-control differences may not be equal to the raw differences. Reported *p*-values are adjusted for clustering at the community level.

[a] *p*-Value from a Pearson chi-squared test for equivalence of the treatment and control distributions, adjusting for clustering at the community level.

*/**/***Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

D. Implications of differences between treatment and control communities

The statistical tests in this chapter suggest that the treatment and control samples were broadly similar at baseline in terms of most key characteristics and outcomes related to agricultural production. As in Chapter II, considering the many characteristics and outcomes that we tested, the number of significant differences is no greater than one would expect by chance if the treatment and control samples were truly similar.

However, there is one important difference that the evaluation will have to take into account: farmers in the treatment sample were substantially more likely to cultivate targeted table grapes and substantially less likely to cultivate targeted vegetables relative to the control sample. Although neither of these differences is statistically significant, the magnitudes are relatively large and could be a cause for concern if production or market shocks affect specific crops. For example, an external shock in the market for table grapes could lead to differences between the treatment and control samples that are unrelated to the value chain trainings. It will therefore be important to consider differences in cultivation of targeted crops when interpreting our results, and to explore the extent to which these compositional differences might be driving the results. For example, although we have limited statistical power to estimate impacts by value chain, we could still conduct analyses by value chain to explore whether a specific value-chain might be driving the results.

Further, there was a large difference between the treatment and control communities in mean farm profits, a key outcome for the evaluation, although this difference was not statistically significant because of high variability in profits. Given the importance of this outcome, we intend to control for baseline farm profits in the ultimate impact analysis.

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IV. TRAINING PARTICIPATION

In this chapter, we examine awareness of and participation in agricultural trainings in the treatment and control samples during the year prior to the administration of the 2012–2013 Farm Operator Survey. Because value chain training aims to help farmers upgrade production and post-harvest processes by training farmers in improved practices, examining the training landscape at the start of the evaluation provides valuable context. In addition, because participation in value chain trainings that were conducted prior to the 2012–2013 Farm Operator Survey could have affected the balance between the treatment and control samples at baseline (for example, in terms of practice knowledge and use), it is important to document the extent of training participation. This chapter focuses on self-reported participation in agricultural trainings, including value chain trainings, during the 12 months prior to the administration of the Farm Operator Survey. In Table IV.1, we summarize the key measures related to agricultural trainings that the survey captured.

Table IV.1. Measures of agricultural training awareness and participation

Measures	Time frame
Training awareness and participation. Awareness of trainings in the respondent's geographic area; participation of household or farm members in training.	Previous year
Training characteristics. Focus of trainings in which any household or farm member participated; provider of trainings; duration of trainings; time to reach trainings.	Previous year
Satisfaction with training. Perceived usefulness of trainings in which any household or farm member participated.	Previous year
Information sharing. Sharing of information obtained in trainings.	Previous year

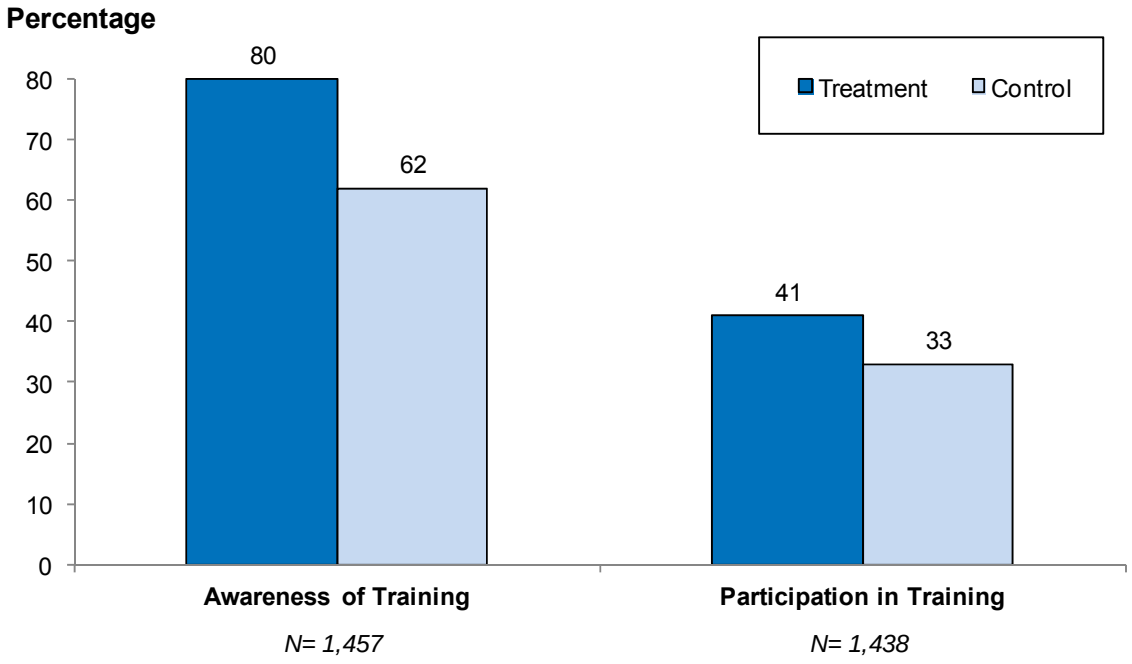
A. Training awareness and participation

The Farm Operator Survey captured information on awareness of and participation in agricultural training for all farms in our sample. Participation focuses on whether any member of the household (small and medium farms) or farm (large farms) participated in training. About 80 percent of respondents in the treatment sample were aware of agricultural trainings conducted in their geographic area in the previous 12 months, compared with 62 percent in the control sample—a relatively large but not statistically significant difference (Figure IV.1). The training participation rates for the treatment and control samples are each about half of the respective awareness rates.

If a household or farm did not participate in training, the survey asked the respondent to indicate the reasons for nonparticipation. The principal reasons for not attending training were conflicting work-related obligations or social obligations (each reason given by about 23 percent of the treatment sample respondents who did not attend a training). Distance, lack of interest in trainings offered, and no training offered on a crop of interest (each reason reported by 16 percent of the nonparticipating treatment sample) were also common reasons for not

participating. The reasons for not participating in training were statistically significantly different in the control sample; specifically, social obligations were much less likely to be cited as a reason for nonparticipation, while lack of interest was much more likely to be cited (Figure IV.2).

Figure IV.1. Awareness of and participation in agricultural trainings (percentage of farms)

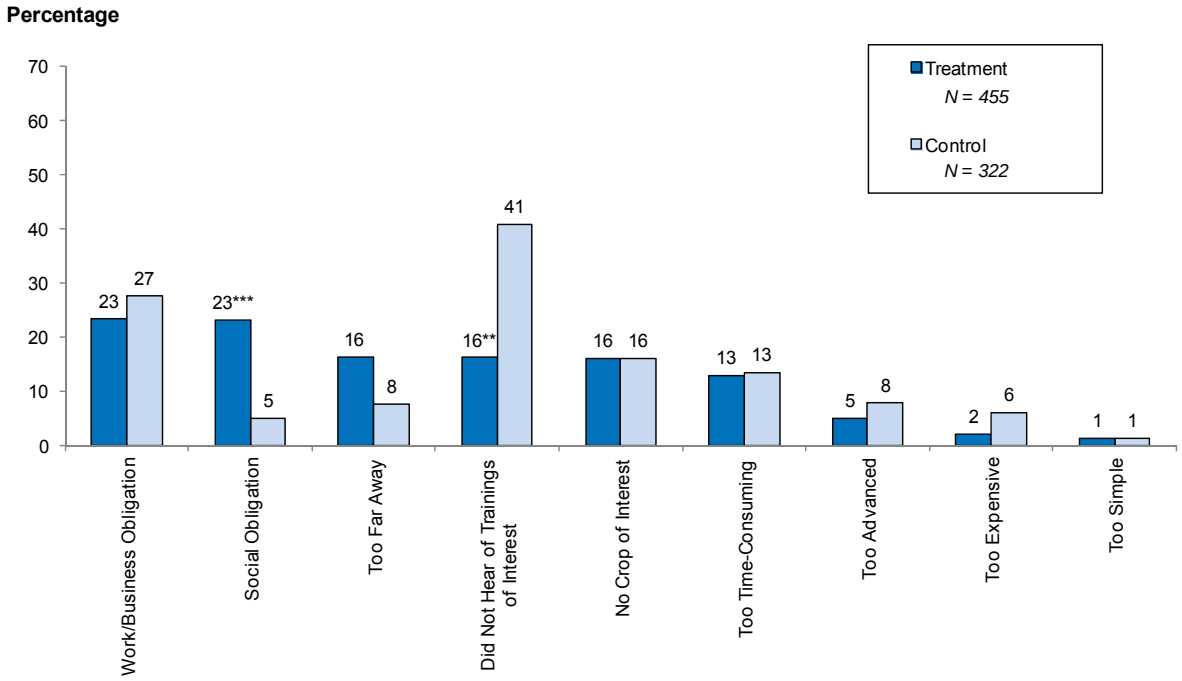


Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Figure presents respondent's awareness of agricultural trainings in his or her area. Figure also presents household (small and medium farms) or farm member (large farms) participation in agricultural trainings in the 12 months prior to the interview. Percentages are not regression-adjusted and are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control samples are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Statistical significance of differences is based on *p*-values that are adjusted for clustering at the community level.

*/**/***Adjusted treatment-control difference significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

Figure IV.2. Reasons for nonparticipation in agricultural trainings (percentage of farms that did not participate in training)



Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Figure presents reasons the farm did not participate in agricultural training in the 12 months prior to the interview. Respondents could cite more than one reason. Percentages are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control areas are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Statistical significance of differences is based on *p*-values that are adjusted for clustering at the community level.

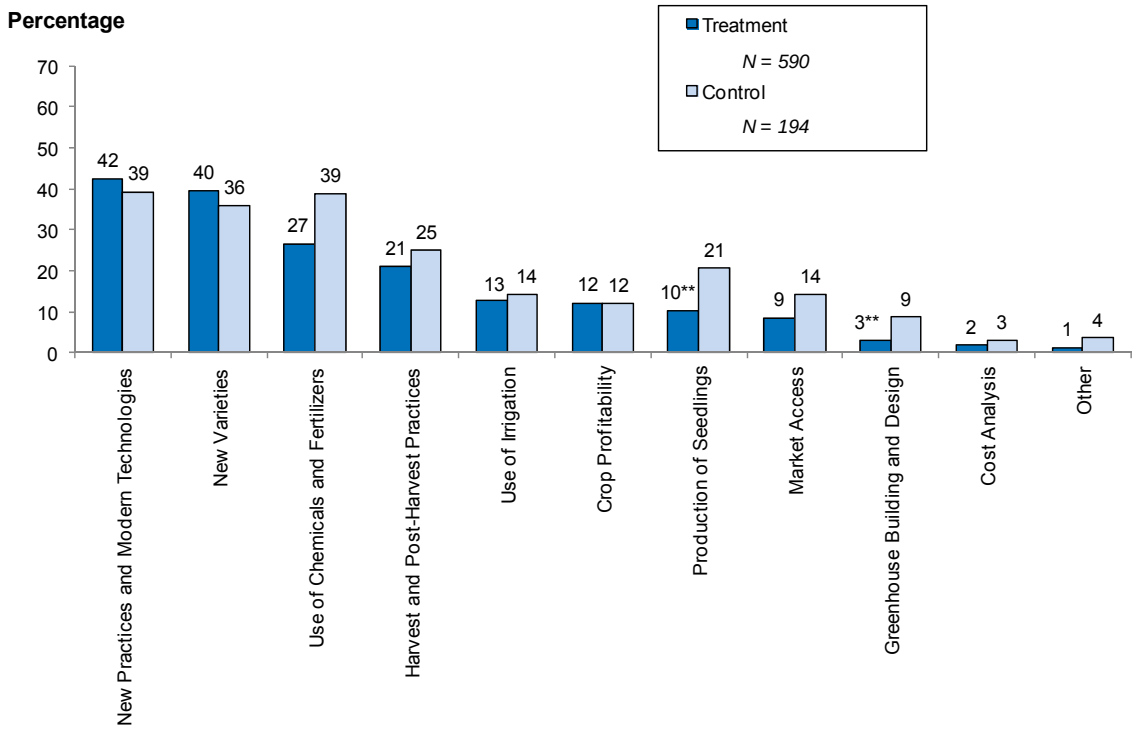
*/**/***Adjusted treatment-control difference significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

B. Training characteristics

For the farms that participated in trainings, the survey collected information from the respondent or another participant on as many as three of the most recent trainings in which he or she participated in the previous 12 months (in the treatment sample, the median training participant attended just one training).[26] Trainings covered a variety of topics (Figure IV.3), the most popular of which were new practices and technologies (42 percent of all trainings attended by the treatment sample), new crop varieties (40 percent), the use of chemicals and fertilizers (27 percent), and harvest and post-harvest practices (21 percent). These four topics were the most common in the control sample, as well.

[26] The survey collected information on trainings from respondents who participated in any agricultural training over the previous 12 months. If a respondent did not participate but identified another household or farm member who participated, the survey collected information from the most recent participant. If the most recent participant was not available, the survey collected no further training information for the farm.

Figure IV.3. Agricultural training topics (percentage of trainings attended)



Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Figure presents the percentage of agricultural trainings focusing on a given topic of trainings that were attended by the respondent or another household/farm member in the 12 months prior to the interview. Respondents could cite more than one training topic. Percentages are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control samples are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Statistical significance of differences is based on *p*-values that are adjusted for clustering at the community level.

*/**/***Adjusted treatment-control difference significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

Most trainings in the treatment sample were provided by extension service providers (71 percent; Figure IV.4).[27] Trainings provided by the ACED project (20 percent) and the ministry or district department of agriculture and food (12 percent) were also common in the treatment sample.[28] The control sample reported significantly more trainings provided by extension service providers (85 percent) and the ministry or district department of agriculture and food (47 percent), and significantly fewer ACED-provided trainings (2 percent of all trainings).

Because value chain trainings (sponsored by ACED) were often delivered by other entities, some farmers may have been uncertain whether a given training was provided by the ACED project. Therefore, it is possible that ACED funded some of the trainings for which participants

[27] Trainings could have been conducted by more than one provider: 12 percent of reported trainings in the treatment sample had multiple providers.

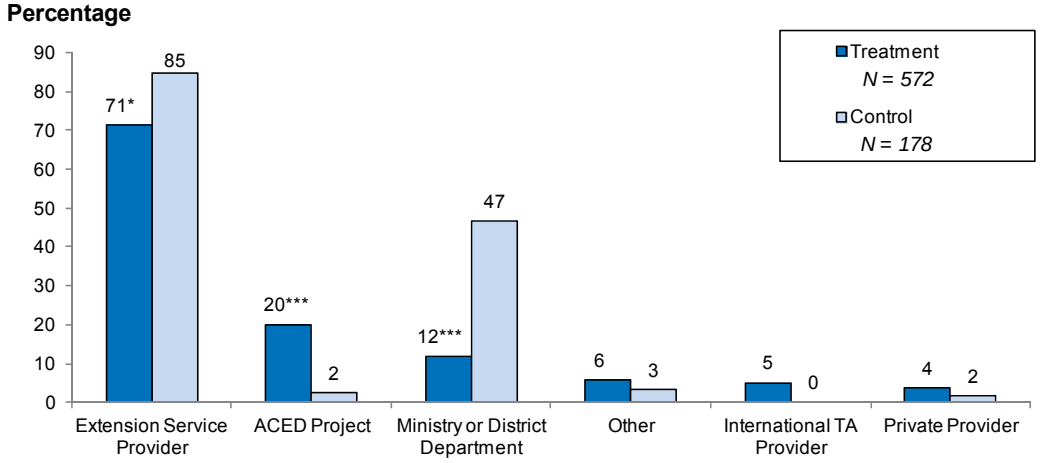
[28] Value chain trainings are sponsored by the ACED project. The survey referred to the "ACED project," because farmers were more likely to be familiar with the broader ACED project and know of these as "ACED trainings."

listed other providers. Consistent with this uncertainty about ACED funding, when asked directly, many training participants reported that they did not know whether ACED was the provider but in most cases still listed other training providers.[29] Specifically, treatment sample participants reported that they were uncertain whether the ACED project was the provider for 13 percent of all trainings attended; control sample participants did not know whether ACED was the provider for 21 percent of all trainings (not shown).

To capture the intensity of trainings, the survey also captured information on the duration of trainings. About 65 percent of all trainings in the treatment sample lasted from two to five hours, with trainings requiring slightly less than four and a half hours to complete, on average (Table IV.2). In the control sample, training duration was generally longer, with trainings taking almost two hours longer, on average (a statistically significant adjusted difference).

To determine whether farmers travel long distances to trainings, the survey gathered information on the time spent traveling to trainings. The mean travel time to treatment sample trainings was about 38 minutes, considerably less than in the control sample (52 minutes, for a statistically significant adjusted difference of 18 minutes; Table IV.2).

Figure IV.4. Providers of agricultural trainings (percentage of trainings attended)



Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Figure presents the percentage of agricultural trainings offered by a given provider of trainings that were attended by the respondent or another household/farm member in the 12 months prior to the interview. Respondents could cite more than one provider. Percentages are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control areas are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Statistical significance of differences is based on *p*-values that are adjusted for clustering at the community level.

*/**/***Adjusted treatment-control difference significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

[29] The survey asked two questions on the training provider for each training: (1) whether the training was provided by the ACED project, and (2) which non-ACED providers provided the training. The second question was asked only if the participant reported that ACED was not the provider or that he or she did not know whether ACED wasthe provider. In the analysis, trainings that respondents did not know were provided by ACED were recorded as being provided by the alternative provider identified in the second question.

Table IV.2. Duration of and travel time to trainings (percentage of trainings unless otherwise indicated)

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Duration of training	603	205				0.43[a]
≤1 hour			0.0	0.0	0.0	--
>1–≤2 hours			21.2	14.4	0.1	0.99
>2–≤5 hours			64.6	57.2	19.7	0.04**
>5–≤10 hours			10.2	21.6	-13.4	0.25
>10 hours			4.1	6.8	-6.5	0.07*
Median			3.0	4.0	--	--
Mean			4.3	5.5	-1.7	0.06*
Travel time to reach training	568	172				0.01[a]***
≤15 minutes			19.7	3.4	16.2	0.02**
>15–≤30 minutes			51.6	32.8	18.4	0.03**
>30–≤60 minutes			18.7	37.7	-13.1	0.14
>60 minutes			9.9	26.0	-21.5	0.00***
Median			30	40	--	--
Mean			38	52	-18	0.00***

Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table presents the duration of and time to reach trainings in which a household or farm member participated in the 12 months prior to the interview. To account for outliers, duration of and travel time to trainings were trimmed at three standard deviations above and below the mean for each farm size category (small, medium, large). Percentages, means, and medians are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control areas are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Statistical significance of differences is based on p-values that are adjusted for clustering at the community level.

[a]*p*-Value from a Pearson chi-squared test for equivalence of the treatment and control distributions, adjusting for clustering at the community level.

*/**/***Adjusted treatment-control difference significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

C. Satisfaction with training and information sharing

Although fewer than half of the farms in the treatment sample participated in agricultural trainings, those that did generally reported a high degree of satisfaction with trainings attended. Almost all (97 percent) of the trainings provided to farmers in the treatment sample were rated as useful or very useful (not shown).[30] Participant satisfaction with trainings was similarly high in the control sample.

Because the sharing of information about practices learned at trainings is an important component of the ACED program logic, the survey also asked participants whether they shared the information that they learned at trainings with nonparticipating farmers (outside of their household).[31] Participants in the treatment sample shared information with nonparticipating farmers in at least some detail from nearly 80 percent of the trainings attended; control participants shared information in at least some detail from about 90 percent of all trainings attended (not shown).

D. Implications of differences between treatment and control communities

The analysis in this chapter suggests that there were some important differences between treatment and control communities in training participation as reported in the 2012-2013 Farm Operator Survey. The overall rate of training participation was substantially higher in treatment communities compared to control communities (although the difference was not statistically significant); there were also significant differences in some characteristics of trainings, such as travel time to the trainings and average duration of trainings. Some of these differences are likely due to the provision of ACED value chain trainings in some treatment communities prior to the 2012-2013 Farm Operator Survey. Indeed, farmers in the treatment communities were significantly more likely to report that they had participated in an ACED-provided training than those in the control communities (notwithstanding the challenges in accurately identifying the provider of trainings). However, because the reported differences in training likely capture the effects of the ACED value chain trainings conducted prior to the survey, we do not intend to adjust for them in our impact analysis.

[30] In the survey, trainees reported on satisfaction using a five-point scale: (1) not at all useful; (2) a little useful; (3) somewhat useful; (4) useful; or (5) very useful. Our analysis of perceived usefulness of trainings focuses on the percentage reporting 4 or 5 on this scale.

[31] In the survey, trainees could select one of the following options to describe their sharing of information with nonparticipating farmers about practices learned at each training: no practices learned; shared information in great detail; shared information in some detail; shared information briefly or in passing; or never shared information.

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V. SOURCES OF INFORMATION AND PRACTICE USE

In this chapter, we examine sources of information about agricultural practices and other farm-related activities and describe knowledge and use of specific practices covered by value chain trainings. Increased use of improved practices covered by these trainings is the principal mechanism through which trainings are expected to upgrade farmer production and post-harvest processes. Examining farmers' existing sources of information and current knowledge and use of specific agricultural practices will thus provide important context and a benchmark against which the effects of future agricultural trainings can be assessed.

Because value chain trainings were conducted in several treatment communities before the 2012–2013 Farm Operator Survey data were collected, some baseline measures of practice knowledge and use might have been affected by prior trainings. We consider this possibility in interpreting the differences between the treatment and control samples in this chapter. In Chapter VII, we conduct a closer examination of how early value chain trainings could have affected baseline balance in our sample. Table V.1 summarizes the key measures that the survey captured related to information sources, as well as knowledge and use of practices that we will discuss in this section.

Table V.1. Measures of sources of information and practice use

Measures	Time frame
Sources of information. Sources of technical advice and information about agricultural practices; crops to cultivate; sales price; and business plans, subsidy or credit applications, or agricultural projects.	Previous year
Practice knowledge. Number of practices known for targeted crops; sources of information about known practices.	As of survey date
Practice use. Number of practices used for targeted crops; reasons for not using known practices.	2012 agricultural season 2011 agricultural season
Land under improved practices. Hectares and percentage of cultivated farm land under improved practices.	2012 agricultural season

A. Sources of information

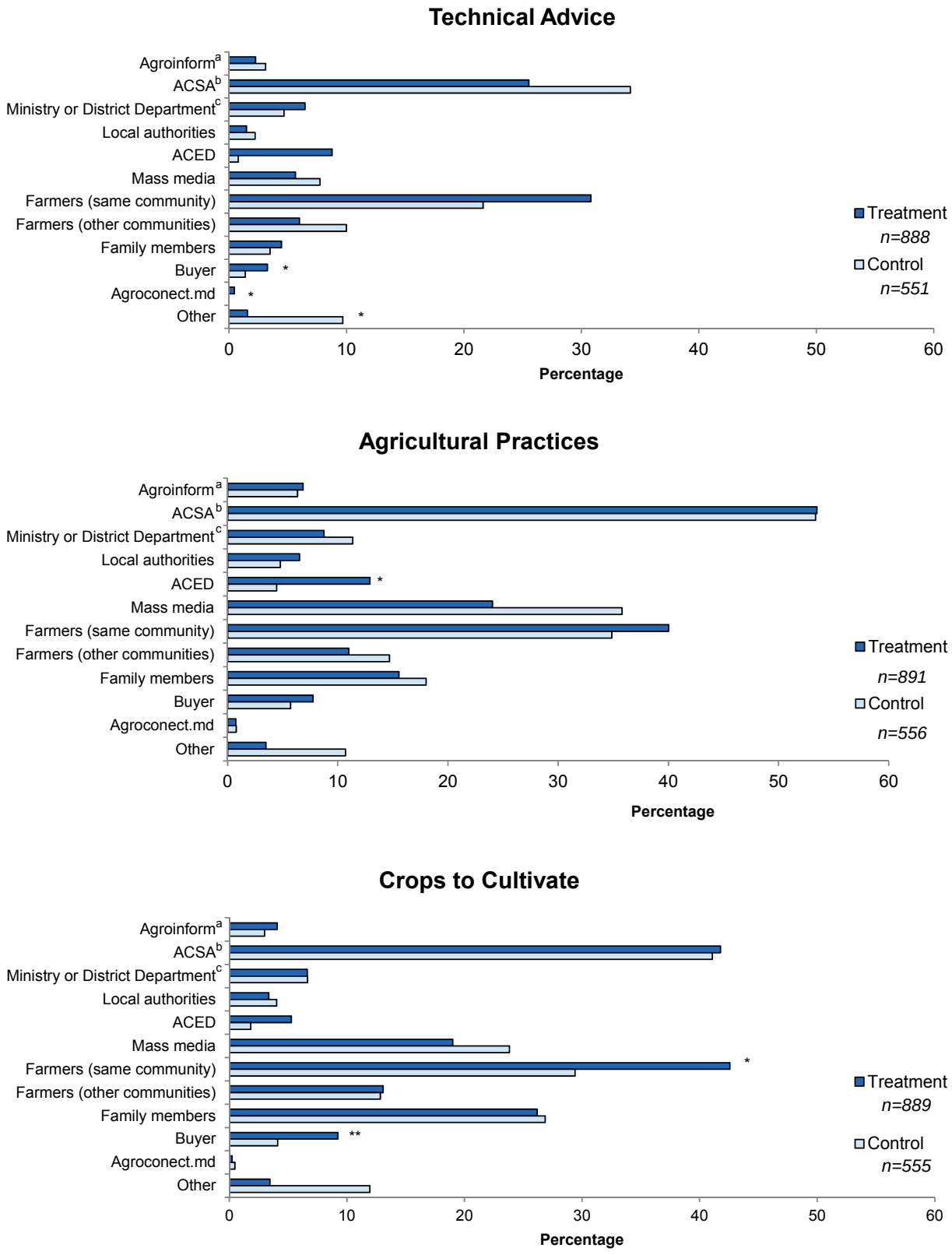
We begin by describing the main sources of information about various farm-related activities.[32] In the treatment sample, the most common sources of technical advice regarding farm operations and sources of information on agricultural practices and which crops to cultivate were marketing information systems supported by ACSA (the agricultural extension service provider contracted by the Ministry of Agriculture and Food Industry) and farmers in the same community (Figure V.1). Marketing information systems supported by ACSA were also the most cited source for information about business plans, subsidy or credit applications, or agricultural projects.[33] The most common sources of information on pricing were buyers, farmers in the same community, and marketing information systems supported by ACSA.[34] The sources of information on farm-related activities were largely similar in the control sample, although there were a handful of statistically significant differences.

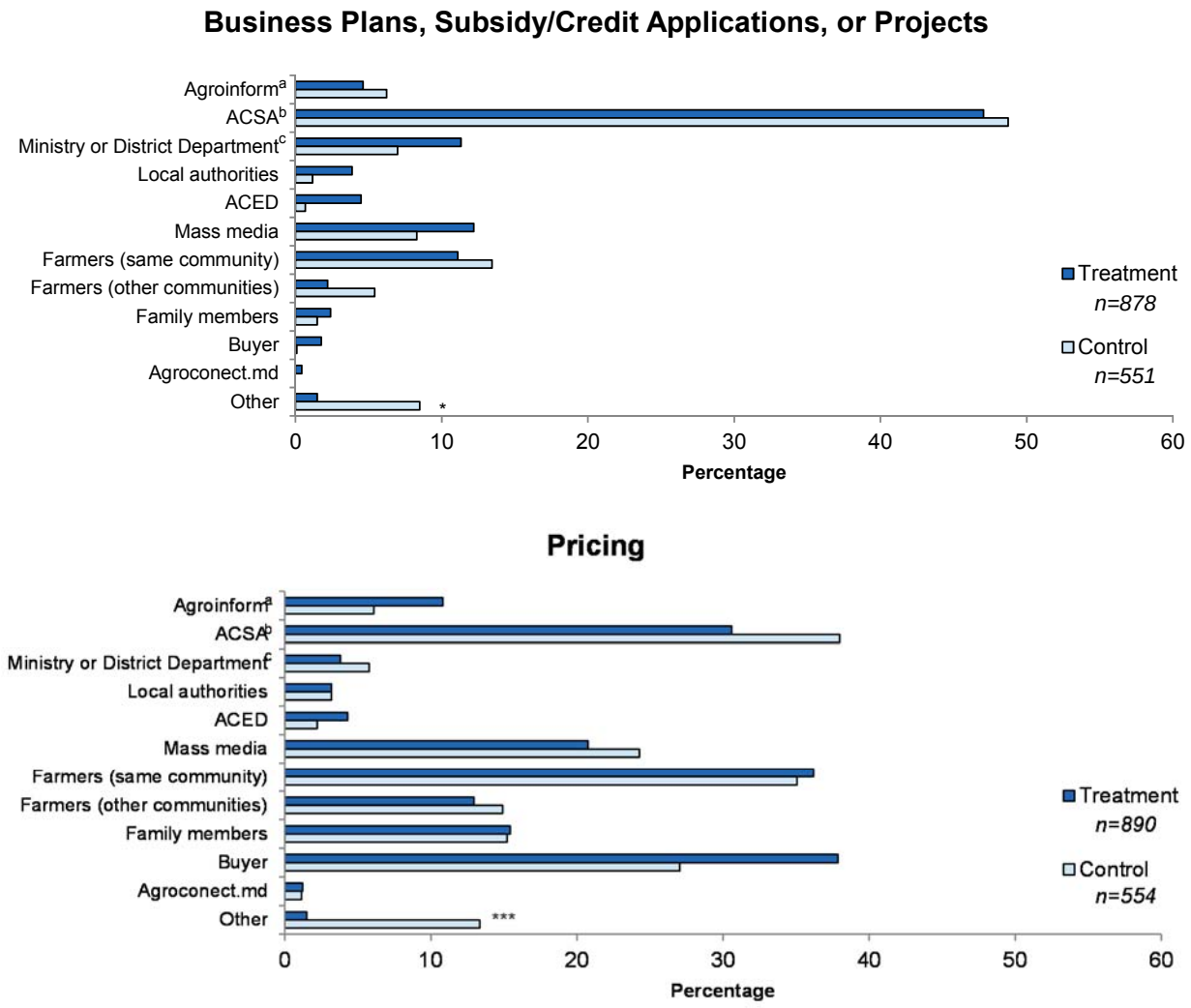
[32] In the survey, respondents could list multiple information sources for each farm-related activity.

[33] The survey asked about sources of information for farm-related activities related to business plans, subsidy or credit applications, and agricultural projects collectively in a single question.

[34] There may have been some confusion about the sources of information about farm-related activities, similar to the confusion about the identity of training providers in Chapter IV. Specifically, different entities could contract the same information provider (such a training organization), resulting in confusion over who was ultimately providing the information.

Figure V.1. Sources of information about farming (percentage of farms)





Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Figures present respondents' reports of information sources about various farm-related activities. Percentages for each category of activities can sum to more than 100, because some farmers gave multiple responses. Percentages are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control samples are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Statistical significance of differences is based on *p*-values that are adjusted for clustering at the community level.

[a] Marketing Information Systems supported by Agroinform.

[b] Marketing Information Systems supported by ACSA.

[c] Ministry or District Department of Agriculture and Food.

*/**/***Adjusted treatment-control difference significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

B. Practice knowledge

Value chain trainings are intended to improve knowledge (and use) of the specific agricultural practices covered by the trainings. To measure knowledge and use of practices in the Farm Operator Survey, the targeted crops were divided into four groups: apples, table grapes, vegetables, and stone fruits.[35] The survey collected data on knowledge and use of specific practices related to each of these groups. The practices that were included in the survey were not an exhaustive list of all practices covered by value chain trainings, both because of survey length limitations and because not all of the trainings had been developed when the survey was conducted. Therefore, through discussions with the ACED project, we identified a more limited set of practices (between 24 and 29 per value chain) that had already been identified for potential inclusion in trainings and were considered to potentially have the largest impacts on farm income.

The average number of practices known by farmers in the treatment sample was similar across value chains: 10 for stone fruits, 13 for apples, 9 for table grapes, and 12 for vegetables (Table V.2).[36] This finding indicates that farmers reported knowing between one-third and one-half of the number of practices covered in the survey. The average number of known practices in the control sample was lower (although not significantly) for targeted apples, table grapes, and vegetables, but significantly higher for targeted stone fruits.

Table V.2. Number of practices known

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Stone fruits	131	164	10.1	12.9	-3.8	0.04**
Apples	193	159	12.6	8.8	4.3	0.23
Table grapes	226	156	9.3	7.3	2.8	0.32
Vegetables	326	83	11.8	11.1	4.2	0.10
All targeted crops	834	514	11.3	11.0	0.5	0.80

Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table presents the average number of agricultural practices (for the specified crop group) that the respondent reports are known to himself, herself, or others who work on the farm. Stone fruits include peaches, plums, and sweet cherries. Vegetables include tomatoes, cucumbers, sweet peppers, salad greens, and culinary herbs that were at least partially grown in a greenhouse. The sample includes farmers who cultivated a given crop in the 2012 agricultural season in communities in which it was targeted. Knowledge of practices related to cold storage use and vegetable seedling production was not reported by respondents if cold storage was not used or seedlings were not produced, respectively, but was assumed to be zero. Means are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control communities are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Because of the regression adjustment, these treatment-control differences may not be equal to the raw differences. Reported *p*-values are adjusted for clustering at the community level.

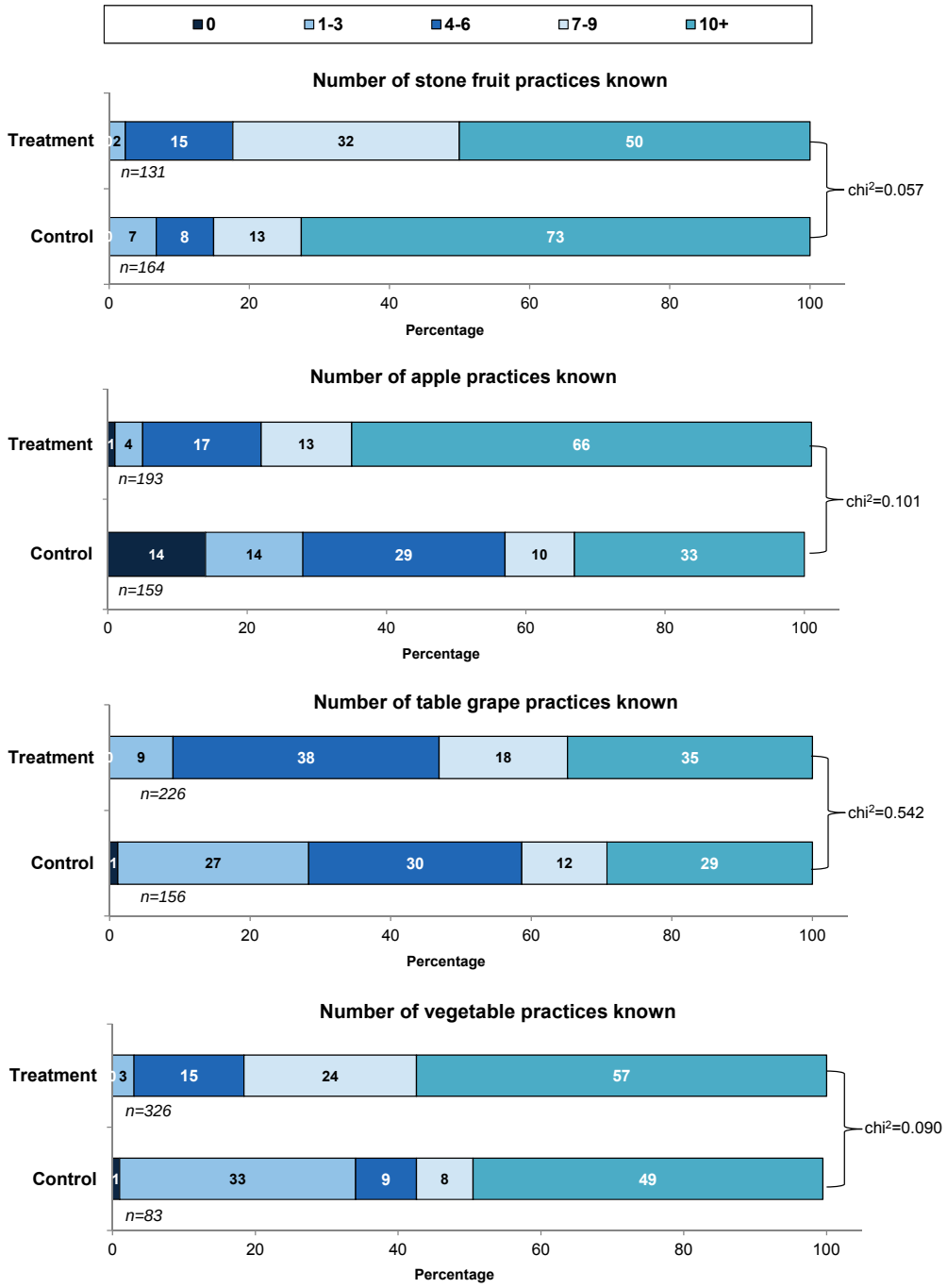
*/**/***Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

[35] Because trainings for nut producers had not been developed when the questionnaire was developed, the survey did not capture practices related to nut cultivation. In addition, for vegetables, only the trainings for tomato producers had been developed when the questionnaire was developed. Therefore, all targeted vegetable farmers were asked about their knowledge and use of practices that might be included in tomato trainings; however, many of these practices are relevant to vegetable cultivation more broadly.

[36] In this chapter, we report practice knowledge and use in aggregate. Appendix C presents knowledge and use of specific practices.

In addition to the average, we also present the distributions of the number of known practices by value chain (Figure V.2). The distributions show that, across all value chains, almost all farmers in the treatment sample know at least one practice, and most know several practices. Comparing the treatment and control distributions, there are notable differences in practice knowledge across value chains, though only some of the differences are statistically significantly different. In the stone fruit and apple value chains, the differences are driven by the percentage of farmers who knew 10 or more practices (larger in control for stone fruits, and larger in treatment for apples). For vegetables, the difference is driven by the larger percentage of control farmers who reported that they knew 1 to 3 practices and the larger percentage of treatment farmers who reported that they knew 7 or more practices. Even for table grapes, for which the treatment and control distributions were more similar than the other value chains, there are large treatment and control differences, particularly in the lower part of the distribution. Thus, although we find only in the stone fruit value chain a statistically significant difference in the mean number of practices known, there are differences in the distribution of practice knowledge in other value chains. The direction of these differences is not consistent across value chains.

Figure V.2. Distribution of number of practices known (percentage of farms)



Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Figure presents the distribution of the number of agricultural practices (for the specified crop group) that the respondent reports knowing. Stone fruits include peaches, plums, and sweet cherries. Vegetables include tomatoes, cucumbers, sweet peppers, salad greens, and culinary herbs that were at least partially grown in a greenhouse. The sample includes farmers who cultivated a given crop in the 2012 agricultural season in communities in which it was targeted. Knowledge of practices related to cold storage use and vegetable seedling production was not reported by respondents if cold storage was not used or seedlings were not produced, respectively, but was assumed to be zero. Percentages are weighted using weights that adjust for sampling probabilities and survey nonresponse. Figure reports *p*-values from Pearson chi-squared tests for equivalence of the treatment and control distributions, adjusting for clustering at the community level.

*/**/***Significantly different from zero at the 0.10/0.05/0.01 level, chi-squared test.

For each known practice, the survey collected data on the specific information sources from which the farmer learned about the practice.[37] Most frequently, the sources of practice information in the treatment sample were neighbors or other farmers (58 percent of farms that know at least one practice), family members (58 percent), media (53 percent), and expert consultants (51 percent; Table V.3). The sources of information in the control sample were broadly similar to the treatment sample.

Table V.3. Sources of information about known practices (percentage of farms that know at least one practice)

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Neighbor or other farmer	775	411	58.5	43.6	15.3	0.11
Family member	738	413	57.6	66.8	-8.9	0.46
Media	756	434	52.5	60.9	-6.3	0.62
Expert consultant	747	395	51.0	34.1	18.4	0.04**
Training session	706	372	44.8	34.2	10.8	0.36
Education	685	366	31.0	23.4	6.9	0.44
Technical bulletin by mail	654	371	12.2	17.1	-2.1	0.82
Other	671	411	24.9	35.1	-10.1	0.30

Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table presents information sources used to learn about any known practice at the farm level. Percentages sum to more than 100, because some farmers gave multiple responses and the table aggregates sources across practices. The sample includes farmers who cultivated a given crop in the 2012 agricultural season in communities in which it was targeted. Percentages are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control areas are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Because of the regression adjustment, these treatment-control differences may not be equal to the raw differences. Reported *p*-values are adjusted for clustering at the community level.

*/**/***Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

C. Practice use

For each known practice, the Farm Operator Survey also asked whether the practice was used on the farm in either of the 2011 and 2012 agricultural seasons. Practice use in the 2011 agricultural season was collected to provide an alternate baseline, in case practice use in 2012 was affected by value chain trainings that were conducted before the end of the 2012 agricultural season (Chapter VII discusses this issue in greater detail).

The mean number of practices used during the 2012 agricultural season varied by value chain. Vegetable farmers in the treatment sample used eight practices in 2012, on average, while stone fruit farmers used four practices and apple and table grape farmers used only three practices, on average (Table V.4). The mean number of practices used in the 2012 season was similar in the treatment and control samples, although the treatment-control differences were marginally statistically significant in the stone fruit and vegetable value chains.

[37] Farmers could identify multiple information sources for each known practice.

The mean number of practices used during the 2011 agricultural season was similar to the 2012 average across all value chains. As in 2012, there were statistically significant differences between the 2011 treatment and control means in the stone fruit and vegetable value chains. There was also a marginally significant difference between the treatment and control group means for apple practices. The similarities between practice use in 2011 and 2012—especially in the treatment communities—suggest that the value chain trainings conducted before the collection of the 2012–2013 survey are unlikely to have affected practice use during the 2012 agricultural season (for more discussion, see Chapter VII).

Table V.4. Number of practices used

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
2012						
Stone fruits	138	171	4.1	5.0	-1.0	0.06*
Apples	195	172	2.9	1.8	1.5	0.28
Table grapes	228	164	3.2	2.7	0.8	0.19
Vegetables	352	90	8.0	6.6	2.9	0.09*
All targeted crops	880	549	5.3	5.1	0.2	0.84
2011						
Stone fruits	135	167	4.2	5.3	-1.0	0.05*
Apples	186	157	3.0	1.3	2.1	0.09*
Table grapes	228	163	3.2	3.4	-0.1	0.81
Vegetables	345	89	7.7	5.8	3.2	0.06*
All targeted crops	861	526	5.2	4.8	0.4	0.71

Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

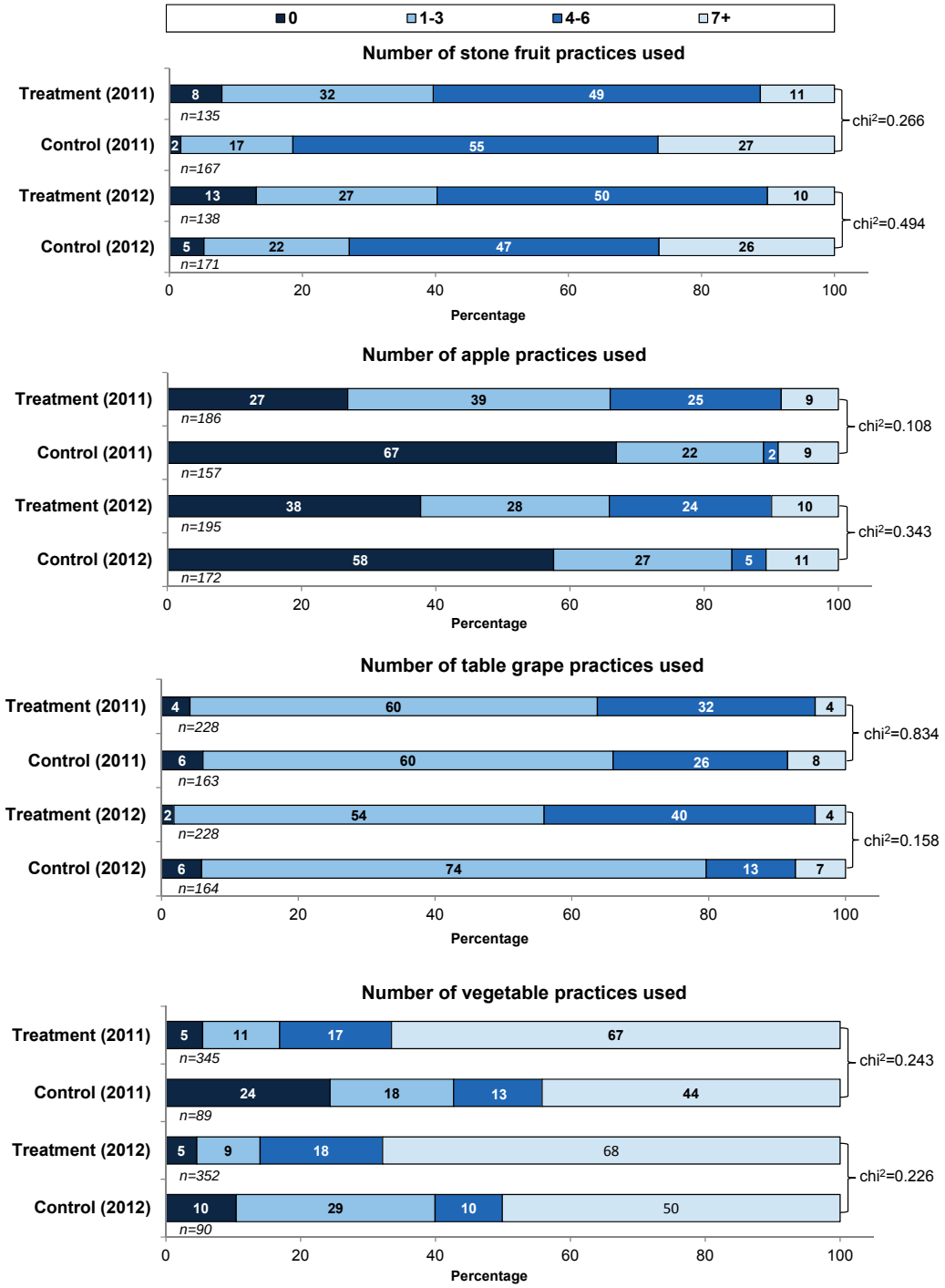
Note: Table presents the percentage of farms that report using each agricultural practice for the specified crop. Stone fruits include peaches, plums, and sweet cherries. Vegetables include tomatoes, cucumbers, sweet peppers, salad greens, and culinary herbs that were at least partially grown in a greenhouse. The sample includes farmers who cultivated a given crop in the 2012 agricultural season in communities in which it was targeted. Use of practices related to cold storage use and vegetable seedling production was not reported by respondents if cold storage was not used or seedlings were not produced, respectively, but was assumed to be zero. Means are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control areas are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Because of the regression adjustment, these treatment-control differences may not be equal to the raw differences. Reported *p*-values are adjusted for clustering at the community level.

*/**/***Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

To complement our analysis of the mean number of practices used, we also looked at the distributions of the number of practices used during the 2011 and 2012 agricultural seasons (Figure V.3). Using these distributions, we were able to conduct two types of comparisons for each value chain: (1) a comparison of practice use for farmers of the same treatment status across years, and (2) a comparison of practice use of the treatment and control samples within a given year. The first comparison enables us to check whether practice use within the treatment and control samples changed from 2011 to 2012, and the second enables us to check for equivalence between the treatment or control samples with respect to practice use in a given year. Our main findings from analyzing these distributions were as follows:

- The distribution of the number of stone fruit practices used was similar across years within the treatment sample. The control sample showed a decline in the number of practices used from 2011 to 2012. Comparing the treatment and control distributions, however, control farmers used more practices than treatment famers in both 2011 and 2012. For example, in both years, about 25 percent of the control sample used seven or more practices, compared with about 10 percent of the treatment sample.
- In the apple value chain, the 2011 and 2012 practice use distributions were also broadly similar within group, although there were some differences. For example, between 2011 and 2012, there was an 11 percentage point increase in the proportion of treatment farmers and a 9 percentage point decrease in the proportion of control farmers not using any practices. In addition, in each year, the treatment and control practice use distributions are notably different, driven mainly by the large percentage of control farmers not using any practices.
- For table grapes, the 2012 practice use distribution looks less similar to the 2011 distribution, particularly for the control group. In 2011, the distribution of the number of practices used is nearly identical in the treatment and control groups. However, although the treatment sample distribution did not change dramatically between 2011 and 2012, farmers in the control sample used fewer practices in 2012 compared with 2011.
- The distribution of the number of vegetable practices used was similar within the treatment sample across years. However, in the control sample there was a decrease from 2011 to 2012 in the percentage of farmers who reported not using any practices. The differences between the treatment and control samples were statistically insignificant in both years.

Figure V.3. Distribution of number of used practices (percentage of farms)



Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Figure presents the distribution of the number of agricultural practices (for the specified crop group) that the respondent reports using. Stone fruits include peaches, plums, and sweet cherries. Vegetables include tomatoes, cucumbers, sweet peppers, salad greens, and culinary herbs that were at least partially grown in a greenhouse. The sample includes farmers who cultivated a given crop in the 2012 agricultural season in communities in which it was targeted. Use of practices related to cold storage use and vegetable seedling production was not reported by respondents if cold storage was not used or seedlings were not produced, respectively, but was assumed to be zero. Percentages are weighted using weights that adjust for sampling probabilities and survey nonresponse. Figure reports *p*-values from Pearson chi-squared tests for equivalence of the treatment and control distributions, adjusting for clustering at the community level. Tests for equivalence across years (within treatment status) show no significant differences, except for the control group stone fruit and vegetable distributions, for which the chi-squared statistics have *p*-values of 0.03 and 0.00, respectively.

*/**/***Significantly different from zero at the 0.10/0.05/0.01 level, chi-squared test.

To determine the extent to which practices were applied on the farm, we used information about the land area on which each practice was applied. Because many farmers used multiple practices—which could have been applied on overlapping or nonoverlapping land areas—we do not have an exact measure of the number of hectares on which *any* practice was applied. Instead, we estimated the land area under improved practices as the largest land area subject to any one practice used on the farm.[38] This measure is conservative and can be viewed as a lower bound for the area on which practices were applied. If there is not full overlap of land use across practices, the area subject to practices will be larger. Because farm sizes vary greatly, we also calculated, for each farm, the percentage of cultivated land subject to any one practice.[39]

The average land area subject to improved practices varies by value chain. In the treatment sample, the average area under improved practices is 13 hectares for stone fruits, 11 hectares for apples, 4 hectares for table grapes, and 0.1 hectare for vegetables (Table V.5).[40,41] For stone fruits and apples, the control sample means are quite different in magnitude (compared with the treatment sample means), but the differences are not statistically significant. The average share of cultivated hectares subject to improved practices on treatment farms was 38 percent for stone fruits, 23 percent for apples, 46 percent for table grapes, and 13 percent for vegetables; although there were large differences between the treatment and control groups, only the difference for the vegetable value chain was statistically significant.

[38] For example, if the farmer used two practices, one practice on 1 hectare and one practice on 10 hectares, we estimate the land area under improved practices as the larger, 10 hectares.

[39] If the farm in the previous example had 20 hectares of cultivated land, this figure would be the larger of 50 percent (10/20) and 5 percent (1/20).

[40] Targeted vegetable crops are mainly cultivated within the greenhouse, explaining the small average value relative to the other value chains.

[41] In all four value chains, the median is considerably smaller; in the treatment sample, the median hectares under improved practices are 1.2 hectares (stone fruit), 0.6 hectare (apples), 1.0 hectare (table grapes), and 0.1 hectare (vegetables).

Table V.5. Land under improved practices

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Hectares per farm						
Stone fruits	135	169	13.0	8.6	8.4	0.47
Apples	183	158	11.2	14.5	-2.2	0.85
Table grapes	227	163	4.1	4.0	0.9	0.77
Vegetables	347	90	0.1	0.1	0.0	0.44
Percentage of cultivated hectares						
Stone fruits	135	169	38.1	39.1	-6.4	0.42
Apples	183	158	22.9	24.3	-7.0	0.49
Table grapes	225	163	45.8	38.2	7.5	0.35
Vegetables	346	90	13.3	6.6	6.9	0.01***

Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table presents the maximum hectares of cultivated land and the maximum percentage of cultivated subject to any single practice at the farm level. Stone fruits include peaches, plums, and sweet cherries. Vegetables include tomatoes, cucumbers, sweet peppers, salad greens, and culinary herbs that were at least partially grown in a greenhouse. The sample includes farmers who cultivated a given crop in the 2012 agricultural season in communities in which it was targeted. To account for outliers, hectares per farm values were trimmed at three standard deviations above and below the mean for each farm size category (small, medium, large). Means are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control areas are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Because of the regression adjustment, these treatment-control differences may not be equal to the raw differences. Reported *p*-values are adjusted for clustering at the community level.

*/**/***Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

Finally, for each practice known but not used during the 2012 agricultural season, the survey collected data on the reasons why the practice was not used (Table V.6).[42] The most frequently reported reason cited by farmers in the treatment sample for not using a known practice was the practice being too costly to implement (86 percent). Farmers in the treatment sample also reported that some practices were not useful (44 percent), took too much time (22 percent), and were too complicated (16 percent), while very few farmers reported not using a known practice because it was used in the previous season (about 3 percent in the treatment sample). More than half (56 percent) of these farmers reported an unspecified reason for not using a known practice. The reasons for non-use in the control sample are mostly similar, although control group respondents were less likely to report that a practice takes too much time (a marginally significant difference).

[42] Respondents were able to provide multiple reasons why a known practice was not used.

Table V.6. Reasons for not using known practices (percentage of farms not using at least one known practice)

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Costly	674	449	85.9	77.2	11.9	0.27
Not useful	607	414	44.3	42.6	6.8	0.60
Takes too much time	528	355	22.3	10.7	12.7	0.07*
Too complicated	535	372	16.2	21.2	-4.3	0.56
Used in previous season	518	345	3.2	3.9	1.2	0.62
Other	591	399	56.0	61.5	-3.8	0.77

Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table presents the reasons for not using known practices at the farm level. Percentages sum to more than 100, because some farmers gave multiple responses and this table aggregates reasons across practices. The sample includes farmers who cultivated a given crop in the 2012 agricultural season in communities in which it was targeted and did not use at least one known practice. Percentages are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control areas are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Because of the regression adjustment, these treatment-control differences may not be equal to the raw differences. Reported *p*-values are adjusted for clustering at the community level.

*/**/***Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

D. Implications of differences between treatment and control communities

In this chapter we identified some significant differences between the treatment and control samples in reported practice knowledge and use, although the direction of the differences was not consistent across value chains. However, when pooling all value chains (as we will do in the impact analysis), the differences are small and not statistically significant. Therefore, these differences do not have major implications for the evaluation. Nevertheless, we will control for the number of practices used in 2011 (before any value chain trainings began) in the impact analysis.

VI. AGRICULTURAL CREDIT

In this chapter, we examine the use of agricultural credit by farmers in our sample and the characteristics of credit received. Agricultural credit is relevant to the evaluation for two main reasons. First, value chain trainings train farmers in improved practices designed to increase production and improve product quality in an effort to generate higher prices and increased sales revenues. Many practices, however, could require significant upfront investments that farmers may not be able to afford; access to credit could make such practices financially accessible to farmers. Second, access to credit is likely to be important for investments in post-harvest infrastructure, which could augment the value of adopting improved practices. In particular, the ability to finance cold storage facilities could extend the window during which perishable crops could be sold, including off-season. This could also further increase the prices received for the produce resulting from the implementation of improved practices, leading to larger increases in income. It will therefore be informative to understand the existing loan patterns of the farmers in our sample.

The Farm Operator Survey collected detailed information on the prevalence and characteristics of loans of all farmers in the sample, focusing on loan applications two years prior to the survey (since December 2010). Table VI.1 summarizes the key loan measures included in the questionnaire that we discuss in this chapter.

Table VI.1. Measures of loan applications and characteristics

Measures	Time frame
Loan applications. Loan application; reasons for application; loan approval.	Previous two years
Loan characteristics. Purpose; size; terms; collateral-to-loan ratio; interest rate.	Previous two years

A. Loan applications

In the two years prior to the Farm Operator Survey, about 19 percent of farmers in the treatment sample applied for a loan to finance their farm's operations, and about 18 percent of farmers in the treatment sample were approved for a loan (Table VI.2). These findings suggests that nearly all the farmers in our sample applying for loans were able to obtain at least one (more than 95 percent of those applying), but most farmers did not access agricultural credit markets in the first place. The principal reasons for not applying for a loan were not needing a loan (44 percent of treatment sample nonapplicants), not wanting to incur any debt (25 percent), and borrowing instead from friends and family (21 percent).[43] Very few farmers were discouraged from applying because the terms of the available loans were unfavorable; because they thought they would not qualify for a loan due to insufficient collateral, a poor credit history, or other reasons; or because they were unaware of the availability of loans. These outcomes were generally similar for the control sample.

[43] The survey asked farmers who did not apply for a loan to report one main reason that they did not apply, even if there were multiple reasons.

Table VI.2. Loan application decisions (percentage of farms)

	Treatment Sample Size	Control Sample Size	Treatment	Control	Difference	*p*-Value
Applied for a loan	902	563	19.1	17.7	1.4	0.66
Approved for a loan	902	563	18.1	16.9	1.2	0.73
Main reason for not applying	717	480				0.31[a]
Did not need loan			43.9	31.2	13.4	0.10
Did not want debt			24.9	38.2	-13.4	0.19
Borrowed from friends or family			21.5	23.3	-2.6	0.64
Unfavorable terms of loan			3.2	3.8	-0.4	0.83
Thought he/she would not qualify due to insufficient collateral			2.9	2.2	0.9	0.56
Thought he/she would not qualify due to other reasons			0.6	1.0	-0.4	0.53
Thought he/she would not qualify due to credit history			0.4	0.0	0.4	0.27
Unaware of loans/application process			0.3	0.1	0.1	0.45
Other			2.1	0.2	2.0	0.23

Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table describes loan applications in the previous two years. Percentages are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control areas are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Because of the regression adjustment, these treatment-control differences may not be equal to the raw differences. Reported *p*-values are adjusted for clustering at the community level.

[a]*p*-Value from a Pearson chi-squared test for equivalence of the treatment and control distributions, adjusting for clustering at the community level.

*/**/***Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

B. Loan characteristics

To understand the characteristics of loans received in the two years prior to the 2012–2013 Farm Operator Survey, the survey asked recipients about the purpose, size, and conditions of each of their loans.[44] The most common purposes for loans in the treatment sample were purchasing inputs (57 percent of loans) and general farm equipment (25 percent), followed by constructing greenhouses (21 percent) and introducing new crops (16 percent; Table VI.3). Most loans received by farmers in the treatment sample (about 63 percent) were less than $5,000, although about 29 percent of the loans were $10,000 or larger. Loans were generally short-term, with nearly three-quarters of loans in the treatment sample having a term of less than two years. Three-quarters of all loans in the treatment sample required collateral of at least the loan value, and one-quarter required at least twice the loan value. Just under half of all loans in the treatment sample had interest rates between 20 and 25 percent, and 8 percent of loans had a rate above 25 percent. The characteristics of loans in the control sample were largely similar.

Table VI.3. Loan characteristics (percentage of loans unless otherwise indicated)

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Purpose of loan[a]	192	81				
Purchasing inputs			57.5	51.5	10.2	0.40
Purchasing other farm equipment			24.9	27.9	4.0	0.59
Constructing greenhouse			21.2	26.3	-8.3	0.33
Introducing new crops			15.6	7.5	6.6	0.28
Purchasing irrigation equipment			13.9	22.8	-10.5	0.22
Purchasing land			8.1	6.3	1.4	0.75
Refinancing/covering other loans/debt			6.0	3.8	1.5	0.70
Paying for irrigation water			5.8	3.6	2.8	0.52
Constructing new buildings/infrastructure for post-harvest activities			4.9	5.5	-1.3	0.77
Improvements to buildings/infrastructure			3.2	4.6	-1.8	0.66
Purchasing livestock			3.0	2.3	1.2	0.69
Constructing new buildings/infrastructure for other purposes			1.9	2.0	-0.3	0.89
Other			6.3	10.9	-7.2	0.23
Size of loan (USD)	183	73				0.33 [b]
<$1000			21.1	14.8	5.5	0.34
≥$1,000<$5,000			42.3	27.0	12.5	0.07 *
≥$5,000<$10,000			7.7	16.4	-4.8	0.35
≥$10,000<$50,000			17.6	19.7	-1.1	0.91
≥$50,000			11.2	22.0	-12.2	0.22
Mean			47,546	43,937	-1,083	0.97
Median			2,525	8,418		

[44] The survey asked respondents for information on the three most recent loans received in the previous two years.

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Term of loan (months)	186	81				0.15 [b]
<6			5.4	2.4	3.2	0.44
≥6<12			9.0	0.4	8.7	0.00 ***
≥12<24			56.6	50.6	6.8	0.62
≥24<36			16.0	22.8	-7.7	0.48
≥36<60			9.8	12.3	-2.5	0.66
≥60			3.2	11.4	-8.4	0.12
Collateral-to-loan ratio	142	60				0.79 [b]
<0.5			17.2	17.9	-3.6	0.77
≥0.5<1			5.7	13.2	-1.3	0.84
≥1<1.5			26.4	12.5	19.1	0.02 **
≥1.5<2			23.0	25.9	-2.4	0.78
≥2<2.5			14.4	13.0	-3.7	0.68
≥2.5			11.7	17.3	-9.4	0.48
Mean			1.5	1.6	-0.2	0.52
Median			1.5	1.5		
Interest rate (percent)	168	73				0.03 **[b]
<5			1.2	12.4	-6.7	0.09 *
≥5<10			4.8	1.6	3.4	0.26
≥10<15			16.3	32.9	-15.6	0.12
≥15<20			23.1	28.9	-4.5	0.63
≥20<25			46.6	18.1	21.5	0.03 **
≥25			8.0	6.2	2.0	0.72

Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table describes characteristics of loans received in the previous two years. Each farm can report as many as three loans. In the treatment sample, 162 farms had at least one loan in the previous two years; in the control sample, 71 farms had at least one loan. Loan size and collateral were converted from Moldovan lei and Euros to U.S. dollars using the average exchange rates in 2012, which were 0.08418 dollars per lei and 1.2861 dollars per euro (www.oanda.com). To account for outliers, loan size and collateral-to-loan ratio were trimmed at three standard deviations above and below the mean for each farm size category (small, medium, large). Percentages, means, and medians are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control areas are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Because of the regression adjustment, these treatment-control differences may not be equal to the raw differences. Reported *p*-values are adjusted for clustering at the community level.

[a]Percentages for purpose of loan may sum to more than 100 percent, because each loan could be used to purchase multiple items.

[b]*p*-Value from a Pearson chi-squared test for equivalence of the treatment and control distributions, adjusting for clustering at the community level.

*/**/***Adjusted treatment-control difference significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

USD = U.S. dollars.

C. Implications of differences between treatment and control communities

The measures of agricultural credit that we examined in this chapter were largely statistically similar in the treatment and control communities. The few statistically significant differences that we did identify, which were likely due to chance, are unlikely to be large enough to substantively affect the outcomes of interest to the evaluation. Underlying differences in access to or receipt of agricultural credit are therefore unlikely to bias the results of the evaluation.

VII. ANALYSIS OF VALUE CHAIN TRAININGS PRIOR TO THE SURVEY

As we mentioned in Chapter I, value chain trainings were conducted in some of the analysis sample communities before the 2012–2013 Farm Operator Survey. Trainings prior to the survey might explain some of the significant differences between the treatment and control samples identified in previous chapters. If these differences are indeed due to pre-survey exposure to value chain trainings, we would have to be cautious about using information from the 2012–2013 survey as baseline data in the ultimate impact analysis. Specifically, impact estimates controlling for baseline differences would likely understate the true impacts of trainings. In contrast, if these baseline differences arose from random assignment, it would suggest that random assignment was not fully successful in creating equivalent treatment and control groups; we would therefore have to control for these differences to avoid spuriously attributing them to the trainings.

In this chapter, we explore the extent to which pre-survey value chain trainings are likely to have affected outcomes at the time of the survey. We focus on the proximal outcomes that would primarily be affected by training, namely practice knowledge and use. In Chapter V, we examined these outcomes for the treatment and control samples as a whole; in this chapter, we examine them separately by treatment communities in which pre-survey trainings occurred (trained treatment communities) and those in which they did not occur (untrained treatment communities). If outcomes were affected by trainings prior to the survey, we might expect trained treatment communities to have higher levels of practice knowledge and use compared with untrained treatment communities. However, because trained treatment communities were not randomly selected, they could be different from the untrained communities in underlying characteristics. In our analysis, we therefore attempt to determine whether differences in practice knowledge and use across trained and untrained treatment communities reflect underlying differences or the possible effects of early training. Specifically, we compare patterns of practice use in 2012 with use in 2011, before many trainings were conducted.

A. Extent of pre-survey value chain trainings

Before examining practice knowledge and use separately for communities with and without pre-survey value chain trainings, we document the extent to which these trainings took place in the communities in our analysis sample. In this and subsequent analyses, we focus on trainings that occurred prior to the end of the 2012 agricultural season (September 1, 2012), and trainings that occurred prior to fielding of the 2012–2013 Farm Operator Survey (all interviews occurred before April 1, 2013). Trainings conducted before the end of the 2012 season could have affected practice use in that season, while trainings before the survey (but after the end of the agricultural season) would have primarily affected practice knowledge.[45]

[45] Trainings held after the 2012 agricultural season but prior to the survey could still affect *reports* of practice use even if practice use was not truly affected, if farmers who learn about a given practice tend to give desirable responses or if, through training, they become familiar with terminology describing practices they were already using. However, our analysis for these trainings focuses on practice knowledge, which should be the primary outcome affected over this period.

The majority of communities in the treatment analysis sample had at least one value chain training prior to the 2012–2013 survey (Table VII.1). Of the 41 treatment communities, 16 had a training before the end of the 2012 agricultural season, and 29 had a training before the end of the survey (one control community had a training before the end of the survey). Value chain trainings often consist of a sequence of related trainings, and we would expect outcomes to be more affected if communities had multiple trainings. Though many treatment communities in the sample had at least one training as of April 1, 2013, only about one-quarter had three or more trainings.[46] This finding suggests that most communities experienced a relatively low intensity of value chain training prior to the survey.

Table VII.1. Value chain trainings in analysis sample communities prior to the 2012–2013 Farm Operator Survey

	Treatment	Control
Number of communities with at least one training		
Prior to September 1, 2012	16	0
Prior to April 1, 2013	29	1
Number of communities with at least three trainings		
Prior to September 1, 2012	10	0
Prior to April 1, 2013	11	0
Communities in analysis sample	**41**	**28**

Source: 2012–2013 Moldova Farm Operator Survey and training lists provided by ACED.

Note: Table presents the number of trainings held before the end of the 2012 agricultural season (September 1, 2012) and before the administration of the 2012–2013 Farm Operator Survey (April 1, 2013). These numbers are for communities included in the analysis sample, which we describe in Chapter I.

Although these findings suggest that pre-survey value chain trainings were common in treatment communities, not all farmers in trained treatment communities participate in trainings, and farmers in untrained treatment communities (and control communities) can travel to attend trainings. Of course, if farmers in the analysis sample did not attend trainings, we would not expect large differences in outcomes, even if trainings were offered in their communities.[47] We therefore examined participation rates in value chain trainings in trained and untrained treatment communities, and compared these findings with participation rates in the control sample.

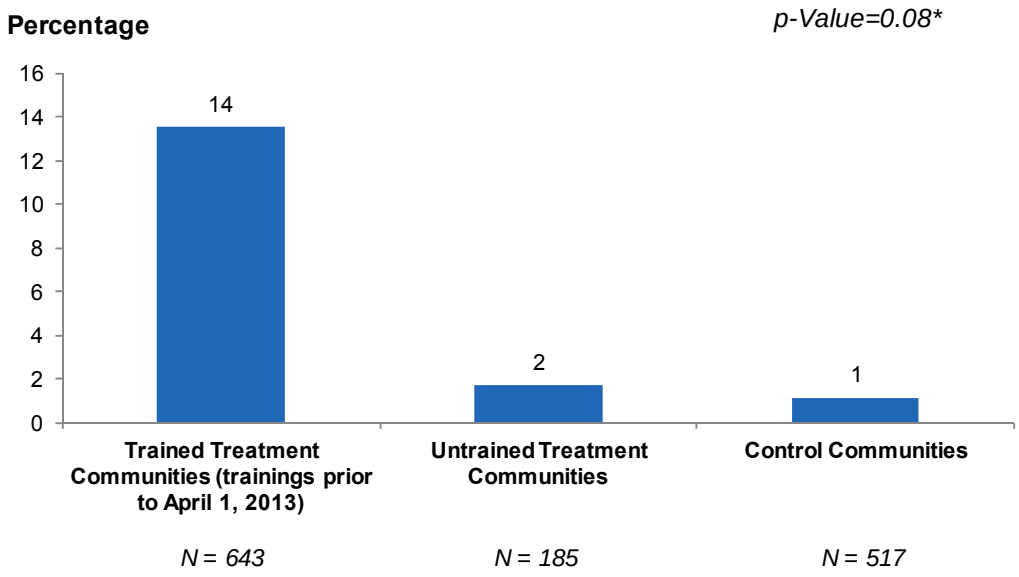
Our main measure of value chain training participation in the 2012–2013 Farm Operator Survey is self-reported participation in ACED-sponsored training in the previous year. About 14 percent of farmers in the trained treatment communities reported participating in an ACED training, compared with a very small percentage in the untrained treatment and control

[46] Some of the communities with only one training received additional trainings after April 1, 2013.

[47] Although farmers attending trainings could share information with farmers in the analysis sample, we would expect information sharing to typically take more time.

communities (Figure VII.1).[48] For the full set of treatment communities, the participation rate was only 11 percent (not shown). Based on these relatively low self-reported participation rates, we would not expect pre-survey trainings to have substantively affected outcomes in the treatment group. Nevertheless, because respondents might have had difficulty accurately identifying ACED-provided trainings (so that participation rates might be understated), we examine differences in practice knowledge and use by community training status.

Figure VII.1. Self-reported participation in ACED-sponsored trainings in the previous year (percentage of farms)



Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample and training lists provided by ACED.

Notes: Figure presents percentage of farms self-reporting participation in an ACED-sponsored training in the year prior to the Farm Operator Survey. Percentages are weighted using weights that adjust for sampling probabilities and survey nonresponse. Statistical significance of difference between trained and untrained treatment communities is based on *p*-values that are adjusted for clustering at the community level.

[a] *p*-Value from a test of difference between the trained and untrained treatment percentages.

*/**/***Trained-untrained difference significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

B. Practice knowledge

Practice knowledge could have been affected by any value chain trainings held before the survey (which was fielded between January and March 2013). Mean practice knowledge was significantly higher for trained versus untrained apple treatment communities by this date, but similar across trained and untrained treatment communities for table grapes and vegetables (Table VII.2). (Almost all stone fruit farmers were in treatment communities that were trained by this date, so we could not conduct these comparisons for stone fruits.) Therefore, trained

[48] This analysis is slightly different from that in Chapter IV, in which we reported participation at the training level rather than the farm level.

communities do not appear to have systematically higher practice knowledge than untrained communities across value chains.

Table VII.2. Number of practices known in trained treatment, untrained treatment, and control sample communities

	Sample sizes			Number of practices known			Trained–untrained difference	
	Control	Trained treatment	Untrained treatment	Control	Trained treatment	Untrained treatment	Difference	*p*-Value
Stone fruits	164	130	1	12.9	10.0	--	--	--
Apples	159	167	26	8.8	13.2	8.4	4.8	0.07*
Table grapes	156	204	22	7.3	9.3	8.7	0.6	0.83
Vegetables	83	201	125	11.1	11.8	11.6	0.2	0.93

Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample and training lists provided by ACED.

Notes: Table presents mean number of practices known by each farm, by value chain. Trained treatment communities are treatment sample communities that hosted at least one training prior to April 1, 2013. Means are weighted using weights that adjust for sampling probabilities and survey nonresponse. The mean and difference involving untrained stone fruit communities are not reported because of the small sample size. Statistical significance of difference between trained and untrained treatment communities is based on *p*-values that are adjusted for clustering at the community level.

*/**/***Trained-untrained difference significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

C. Practice use

Practice use, a key intermediate outcome for the evaluation, could have been affected by value chain trainings taking place before the end of the 2012 agricultural season. We therefore examine the extent to which some of the differences between the treatment and control samples in practice use, discussed in Chapter V, were driven by trained treatment communities. To examine whether the differences involving trained communities are likely to be due to training and not underlying differences, we also conducted the same comparisons for practice use in 2011, which would generally not have been affected by trainings.

Within each value chain, the mean number of practices used in 2012 was similar in the trained and untrained treatment samples—the differences in practice use were small and statistically insignificant (Table VII.3). The only statistically significant difference was for the trained treatment vegetable sample (this finding suggests that *fewer* practices were used in trained communities compared with untrained communities). The differences are therefore not consistent with the trained treatment sample having systematically higher levels of practice use.

The pattern of practice use was generally very similar in the 2011 season. Mean practice use was similar to 2012, and the same difference that was statistically significant in 2012 was also statistically significant in 2011. Overall, the evidence suggests that practice use in trained treatment communities was not affected by value chain trainings held prior to the survey, and that any treatment-control differences in practice use at baseline were pre-existing differences.

Table VII.3. Number of practices used in trained treatment, untrained treatment, and control sample communities

	Sample sizes			Number of practices used			Trained–untrained difference	
	Control	Trained treatment	Untrained treatment	Control	Trained treatment	Untrained treatment	Difference	*p*-Value
2012								
Stone fruits	171	46	92	5.0	3.6	4.4	-0.8	0.41
Apples	172	98	97	1.8	3.5	2.3	1.1	0.53
Table grapes	164	189	39	2.7	3.3	2.6	0.7	0.34
Vegetables	90	86	266	6.6	6.9	8.5	-1.7	0.07*
2011								
Stone fruits	167	43	92	5.3	4.3	4.1	0.2	0.85
Apples	157	91	95	1.3	3.9	2.0	1.9	0.17
Table grapes	163	189	39	3.4	3.2	2.8	0.4	0.55
Vegetables	89	86	259	5.8	6.6	8.2	-1.6	0.07*

Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample and training lists provided by ACED.

Notes: Table presents mean number of practices used by each farm, by value chain. Trained treatment communities are treatment sample communities that hosted at least one training prior to September 1, 2012. Means are weighted using weights that adjust for sampling probabilities and survey nonresponse. Statistical significance of difference between trained and untrained treatment communities is based on *p*-values that are adjusted for clustering at the community level.

*/**/***Trained-untrained difference significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

D. Implications

The results in this chapter suggest that it is unlikely that value chain trainings that were conducted before the 2012–2013 Farm Operator Survey affected outcomes by the time of the survey. Although these trainings were widespread, the participation rate in the treatment group was relatively low, limiting the scope for outcomes to have been affected before the survey was conducted. In addition, patterns of practice knowledge and use suggest that these outcomes were not systematically higher in communities that received training prior to the survey, and the few significant differences in practice use appear to largely pre-date the trainings. Therefore, the 2012–2013 Farm Operator Survey appears to provide valid baseline measures of key outcomes; the differences identified in the previous chapters seem to be chance differences that arose through random assignment. In Chapter IX, we discuss in further detail the implications of these differences for the analysis.

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VIII. GENDER ANALYSIS

In this chapter, we investigate gender roles in farm operations, compare key characteristics and outcomes by the gender of the farm operator, and examine intrahousehold differences in how farm operators and their spouses respond to survey questions about gender roles. These gender analyses are relevant to the value chain training evaluation because they indicate how training affects different types of beneficiaries, including those defined by gender.

Our analysis of differences in key outcomes at baseline by the gender of the farm operator will inform future subgroup analyses of impacts by gender. The analysis of spouses' responses will indicate whether measures of gender roles are significantly affected by the gender of the respondent. If spouses' reports are similar, it will enhance our confidence in measures that are collected from only the primary respondent.

Table VIII.1 summarizes the key measures included in the Farm Operator Survey instrument that we discuss in this chapter. Most of the data for these measures were collected from only small and medium farms; because households do not typically operate large farms, the large-farm questionnaire did not collect information about gender roles, nor did it include an interview with the respondent's spouse.

Table VIII.1. Measures of gender roles, farmer and farm characteristics by gender, and gender roles by gender of the respondent

Measures	Time frame
Gender roles. Involvement in farming decisions and control of farm assets (small and medium farms); gender composition of ownership (large farms).	As of survey date
Farmer and farm characteristics by gender of operator—small and medium farms.	
Farm operator characteristics. Age; education level; household members abroad; marital status.	As of survey date
Cultivated area. Total cultivated area.	2012 agricultural season
Farm profits. Revenues minus farm expenditures.	2012 agricultural season
Total annual consumption. Household consumption plus value of consumption of agricultural production.	Previous year
Agricultural training. Participation in any training; self-reported participation in ACED training.	Previous year
Improved practices. Knowledge and use of improved practices.	2012 agricultural season
Loan characteristics. Loan approval.	Previous two years
Gender roles by gender of respondent—small and medium farms. Involvement in farming decisions and control of farm assets.	As of survey date

A. Gender roles

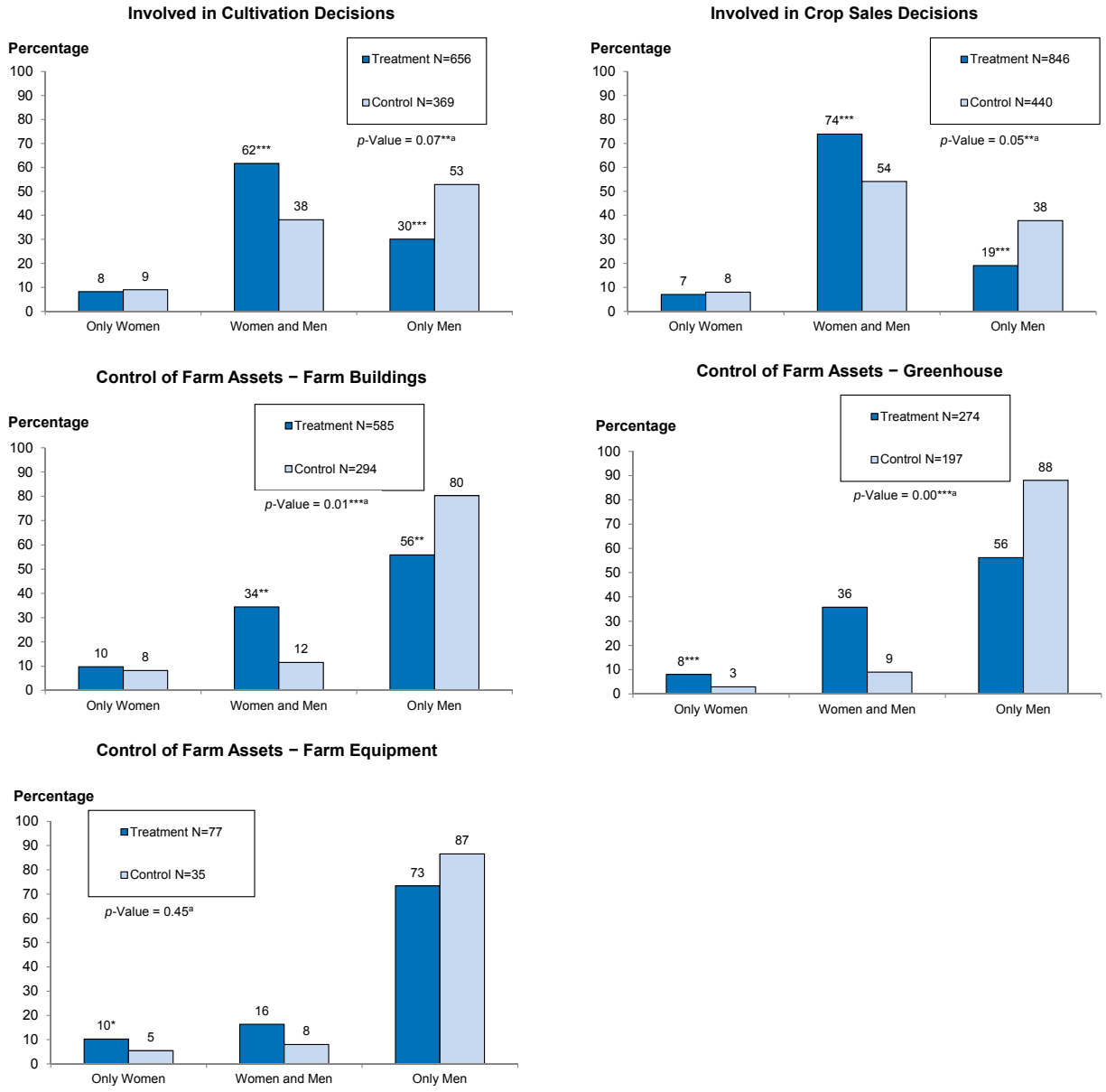
To investigate gender roles in farm operations on small and medium farms, we estimated the percentage of female operators and the involvement of men and women in farm decisions and control of farm assets. As we show in Chapter II, about 31 percent of the small and medium farm operators (who were also selected as respondents) in our treatment sample were female, compared with 15 percent of the control sample.[49] We asked these respondents to identify who in the household was primarily responsible for making cultivation and crop sales decisions; based on those responses, we can characterize decisions as being made by women, men, or both women and men (Figure VIII.1). In the majority of treatment sample farms, men and women make cultivation decisions and crop sales decisions together (62 and 74 percent, respectively). In the remainder of treatment sample farms, these decisions are more often made exclusively by men than by women.

Similarly, farms in the treatment sample are more likely to have men rather than women exclusively in charge of farm assets such as buildings (56 versus 10 percent), greenhouses (56 versus 8 percent) and farm equipment (73 versus 10 percent). However, unlike cultivation and crop decisions, exclusive male control of farm assets is more common than both exclusive female control and joint control. Exclusive decision making and control of assets by men is more commonly reported in the control sample than in the treatment sample, most likely due to chance.

To examine gender roles on large farms, we analyzed the gender composition of farm ownership. As we show in Chapter II, large farms typically have multiple owners. In the treatment sample, large farms jointly owned by men and women and those owned solely by men each account for about 40 percent of large farm ownership, while about 20 percent are owned solely by women (not shown). The gender composition of large farm ownership is similar in the control sample.

[49] As we mention in Chapter II, the respondent to the Farm Operator Survey was the household member "most knowledgeable about farm operations," and is presumed to be the principal farm operator for small and medium farms. However, in some cases, the respondent and his or her spouse may have operated the farm jointly, and the survey respondent may have been determined by availability or willingness to participate. Therefore, some of the farms categorized as male- or female-operated may in fact be jointly operated.

Figure VIII.1. Roles of men and women in farming, small and medium farms (percentage of farms)



Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Figure presents gender of household members involved in various roles on the farm. Table excludes large farms (≥100 hectares), because they operate as businesses. Respondents to the small/medium farm questionnaire were asked to identify the decision maker for their farm's cultivation and crop sales decisions, separately for each land use. For cultivation decisions, areas included arable land, greenhouse, and others; for crop sales decisions, areas included arable land, orchards, vineyards, greenhouse, and others. Orchards and vineyards were excluded from the question about cultivation decisions because cultivation decisions are not made as frequently for these types of land. Percentages are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and control communities are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Statistical significance of differences is based on *p*-values that are adjusted for clustering at the community level.

[a] *p*-Value from a Pearson chi-squared test for equivalence of the treatment and control distributions, adjusting for clustering at the community level.

*/**/*** Adjusted treatment-control difference significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

B. Farmer and farm characteristics by gender of operator

To compare farmer and farm characteristics by the gender of the farm operator, we focused on differences for small and medium farms in the treatment sample (Table VIII.2). The median age is nearly identical for male (53) and female (52) farm operators in our treatment sample. The vast majority of male and female operators have at least some secondary education; men are significantly less likely to have less than a secondary education. Male operators are also significantly more likely than their female counterparts to have a spouse (94 versus 72 percent) and a spouse responding to the spouse module of the survey (77 versus 48 percent), which we analyze in the next subsection.

To compare farm operations by the gender of the operator, we analyzed differences in key outcomes in the treatment sample related to (1) cultivation; (2) income and consumption; (3) agricultural training; (4) knowledge and use of improved practices; and (5) the credit market. Our main findings are as follows:

- Male operators on average cultivate significantly more land than female operators (5.48 hectares versus 3.28 hectares, an adjusted difference of 1.77 hectares). This result is driven mainly by the fact that male operators are more likely to cultivate farms that are larger than 10 hectares.
- Female-operated farms on average generated higher profits ($1,012 versus $794 for males, an adjusted difference of $779). However, the difference in means is not statistically significant.
- Male- and female-operated farm households in the treatment sample have similar mean levels of household consumption.
- There is no statistically significant difference between male- and female-operated farms in the likelihood of having a household member participate in agricultural training (any or ACED-sponsored).
- With the exception of vegetable farmers, male operators report knowing and using more targeted crop practices than female operators, but the differences are generally small and insignificant. However, male operators who cultivate stone fruits report knowing significantly more practices than female operators who cultivate stone fruits, and male operators who cultivate table grapes report using more grape practices than female operators who cultivate table grapes.
- There is no statistically significant difference between the percentage of male and female operators approved for agricultural loans.

Table VIII.2. Differences in farmer and farm characteristics by gender of farm operator (percentage of small and medium farms in the treatment sample unless otherwise indicated)

	Male Farm Operator Sample Size	Female Farm Operator Sample Size	Male Farm Operator	Female Farm Operator	Adjusted Difference	*p*-Value
Age	597	268				0.98 [a]
Younger than 40			13.9	15.0	1.3	0.67
40–49			23.7	23.4	1.1	0.77
50–59			37.7	36.8	-2.5	0.55
60 and older			24.7	24.8	0.1	0.99
Median			53	52		
Education	604	269				0.00***[a]
Less than secondary			1.9	7.3	-4.7	0.02**
Some secondary			33.5	26.7	4.0	0.26
Completed secondary			45.3	50.2	-0.3	0.94
More than secondary			19.3	15.8	1.0	0.74
Any adult household member abroad	601	269	6.7	7.7	-2.1	0.37
Has spouse	605	268	94.4	71.7	25.0	0.00***
Has spouse respondent	605	269	76.8	48.1	31.3	0.00***
Total area cultivated per farm	603	267				0.01***[a]
<1 ha			25.9	27.3	-6.9	0.04**
1–5 ha			52.6	61.4	0.7	0.85
5–10 ha			9.7	5.8	2.5	0.24
10–100 ha			11.8	5.5	3.7	0.04**
Mean (ha)			5.45	3.28	1.77	0.01**
Median (ha)			1.72	1.48		
Farm profits (USD)	579	256				0.27 [a]
$0 or less			29.8	22.0	1.0	0.74
$0–250			7.2	9.5	-3.0	0.22
$250–500			7.6	8.1	-1.7	0.49
$500–1,000			10.7	13.2	-2.1	0.43
$1,000–2,500			20.7	23.8	-0.8	0.83
More than $2,500			24.1	23.4	6.5	0.04**
Mean[b]			794	1,012	-779	0.25
Median			790	929		
Total annual household consumption (USD)	440	221				0.35 [a]
Less than $1,000			7.2	10.6	-5.9	0.01***
$1,000–2,500			36.4	31.7	-1.0	0.81
$2,500–5,000			38.6	37.3	6.6	0.16
more than $5,000			17.7	20.4	0.4	0.91
Mean			3,318	3,518	274	0.10*
Median			2,778	2,862		
Participated in any training in past 12 Months	605	268	40.0	36.6	2.8	0.34
Participated in any ACED training in past 12 months, self-reported	560	252	10.2	12.9	2.8	0.25
Number of practices known						
Apples	116	61	12.2	11.6	0.7	0.54
Table grapes	149	70	9.3	8.9	0.5	0.21
Vegetables[c]	221	103	11.5	12.3	0.8	0.31
Stone fruits[d]	87	33	10.1	7.4	2.6	0.00***

	Male Farm Operator Sample Size	Female Farm Operator Sample Size	Male Farm Operator	Female Farm Operator	Adjusted Difference	*p*-Value
Number of practices used						
Apples	119	60	2.8	1.7	0.2	0.65
Table grapes	151	70	3.2	2.8	0.3	0.08*
Vegetables[c]	242	108	8.0	8.2	-0.2	0.79
Stone fruits[d]	91	35	3.7	3.1	0.2	0.40
Approved for a loan	605	269	16.0	17.9	0.5	0.86

Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table presents farm and farmer characteristics by the gender of the farm operator for small and medium farms in the treatment areas. Table does not include large farms (≥100 ha), because the large farm survey does not identify a single operator. Farm profits and household consumption were converted from Moldovan lei to U.S. dollars using the average exchange rate in 2012, which was 0.08418 dollars per lei (www.oanda.com). To account for outliers, area cultivated, profits, and household consumption were trimmed at three standard deviations above and below the mean for each farm size category (small and medium). Percentages, means, and medians are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between genders are estimated using an ordinary-least-squares regression that controls for community fixed effects. Because of the regression adjustment, these male-female differences may not be equal to the raw differences.

[a] *p*-Value from a Pearson chi-squared test.

[b] Calculation of mean of farm profits includes farms with negative or zero profits.

[c] Vegetable practices focus on tomatoes, cucumbers, sweet peppers, salad greens, and culinary herbs.

[d] Stone fruit practices focus on peaches, plums, and sweet cherries.

*/**/***Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

ha = hectares, USD = U.S. dollars

C. Gender roles by gender of the respondent

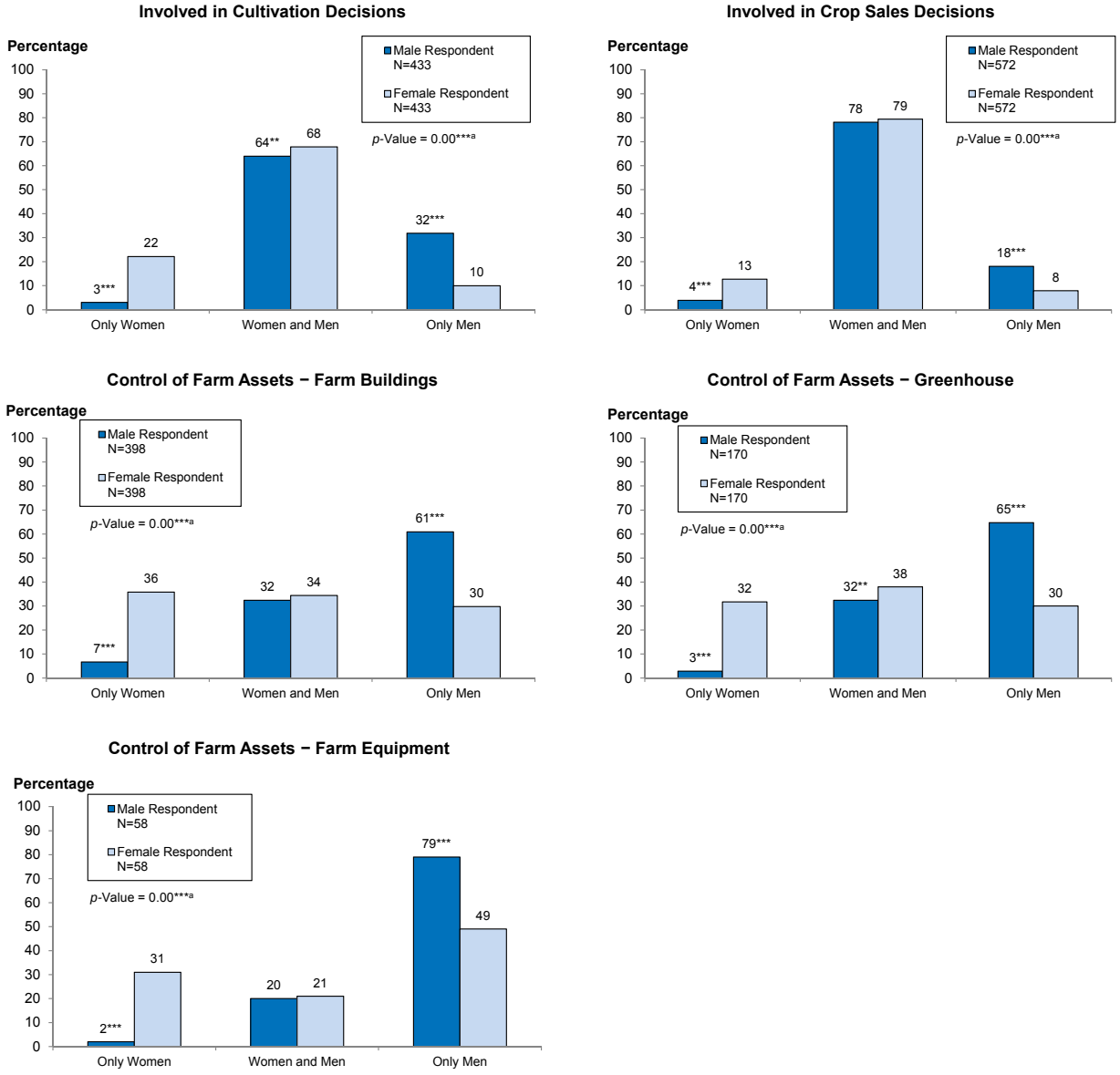
To examine whether the perception of gender roles depends on the gender of the respondent, we compared how farm operators and their spouses responded to the same survey questions regarding these topics.[50] Our analysis is restricted to small and medium farms in the treatment sample and households in which both the respondent and his or her spouse responded.

Overall, we find that reported gender roles are consistent with the trends exhibited in the gender role analysis above, which was based on the perceptions of the primary respondent (the farm operator). Specifically, most cultivation and crop sales decisions in the treatment sample are made collectively by men and women, according to both male and female respondents (Figure VIII.2). Also as above, the percentage reporting joint control of farm assets is lower compared with joint decision making, but similar across respondents of both genders.

Despite the similarities with the gender analysis above, the overall distributions of joint versus male or female exclusive control are significantly different for male and female respondents. This finding is driven mainly by the significant differences in intrahousehold perceptions of exclusive control. For example, in households in which farming decisions are not made jointly, respondents are more likely to report that they have exclusive control. Also, although exclusive male asset control was a common response for both genders, female respondents stated much more frequently that assets were controlled exclusively by or shared with women. In fact, women report exclusive female control of farm buildings and greenhouses just as often as they report exclusive male control.

[50] Due to practical considerations during the administration of the survey, both husband and wife were sometimes present for each others' interviews. As such, some responses are likely to be similar. Any differences between the responses are therefore likely to be a lower bound for the true differences.

Figure VIII.2. Differences between same-farm male and female respondents in reported roles of men and women in farming (percentage of small and medium farms in the treatment sample)



Source: 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Figure presents gender of household members involved in various roles on the farm, as reported by the respondent and his or her spouse. The analysis is restricted to small and medium farms in treatment areas in which the primary respondent and spouse responded to the survey. Respondents to the small/medium farm questionnaire were asked to identify the decision maker for their farm's cultivation and crop sales decisions, separately for each land use. For cultivation decisions, areas included arable land, greenhouse, and others; for crop sales decisions, areas included arable land, orchards, vineyards, greenhouse, and others. Orchards and vineyards were excluded from the question about cultivation decisions, because decisions about cultivation are not made as frequently for these types of land. Percentages are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between genders are estimated using an ordinary-least-squares regression that controls for household fixed effects.

[a] *p*-Value from a Pearson chi-squared test.

*/**/***Same-farm male-female responses significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

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IX. CONCLUSION

In this chapter, we summarize the key findings from our analysis of the 2012–2013 Farm Operator Survey data for the value chain training evaluation. We begin by briefly summarizing characteristics of farms in our sample that are most relevant to the evaluation (particularly those related to agricultural production and practice use), as well as the training landscape into which value chain trainings are being introduced. We then assess the overall degree of similarity between the treatment and control samples at baseline, and the extent to which value chain trainings prior to the survey are likely to be driving some of the differences observed. We also recalculate the minimum detectable impacts (MDIs)—the smallest impacts on key outcomes that our design will be able to statistically distinguish from zero—based on updated parameters from the data. Finally, we outline our future plans for data collection for the evaluation.

A. Summary of findings

1. Characteristics and training experiences of farms in the treatment sample

The analysis presented in this report provides important context on the agricultural activities of farm operators targeted by value chain trainings. These farm operators were defined as those cultivating the specific crops targeted for trainings in their communities. These crops were most commonly vegetables but also included (in order of prevalence) table grapes, apples, and stone fruits and nuts. Key findings related to farm activities of farmers in the treatment sample included:

- Most of the targeted operators cultivated a relatively small area of land (more than three-quarters cultivated less than 5 hectares), though the sample included some large operators.
- Targeted operators' cultivation was not restricted to targeted crops; cultivation of nontargeted crops typically composed a substantial fraction of both cultivated area and farm revenues for these operators.
- Few farmers irrigated their targeted crops (except for vegetables, for which irrigation was widely used), and intensive orchard cultivation was rare.
- Use of cold storage—a key post-harvest practice intended to complement the improvements in quality generated by the value chain trainings—was very limited, even though many farmers knew of a cold storage facility within 5 kilometers of their farm.
- Most farmers who sold their targeted crops sold them to traders/intermediaries or to the final consumer rather than to retailers or processors, and few farmers had any of their production of targeted crops exported.
- More than one-quarter of farmers reported negative farm profits in the 2012 agricultural season, possibly because of a severe drought; nonfarm income was an important contributor to the total income of small and medium farm households.

An increase in practice knowledge and use is the key mechanism through which value training intends to increase the volume and quality of production. On average, at the time of the survey, farmers in the treatment sample reported that (depending on the value chain) they knew between one-third and one-half of the practices discussed in the questionnaire. Average practice use was substantially lower than practice knowledge across all value chains, suggesting that barriers other than lack of knowledge are important constraints to practice use (farmers in our sample cited high costs and perceptions that practices were not useful or too time-consuming as their main reasons for nonuse).

Agricultural trainings, which were typically provided by extension service providers, were common at baseline. Most farmers (about 80 percent of the treatment sample) were aware of at least one training held in their geographical area in the previous year. This finding is consistent with evidence from the qualitative study (ACT Research 2013), which suggested that a variety of agricultural trainings are offered regularly in these communities. However, only about half of farmers who were aware of trainings reported that a farm or household member participated in one in the previous year.

We also examined the features of typical trainings attended by sampled farms in the previous year. The most common topic of trainings attended by treatment sample farmers were new practices and technologies; however, other topics such as new crop varieties and use of chemicals and fertilizers were also common. Most farmers did not travel far to attend trainings (less than one-third of treatment sample participants traveled more than 30 minutes), suggesting that distance is likely to be related to training participation. Participants generally reported high levels of satisfaction with trainings attended, and sharing information learned with training nonparticipants—an important component of the ACED program logic—was very common.

2. Differences between treatment and control communities

We now turn to the implications of our analysis for the validity of the impact evaluation design. Our design relies on the treatment and control samples being similar at baseline in characteristics that might be related to key outcomes, as well as baseline levels of those outcomes. Any differences that subsequently arise between the two samples can then be attributed to the impact of the value chain trainings.

Random assignment should, on average, result in treatment and control samples that are similar at baseline, ensuring a valid design. However, a given random assignment draw could still yield large baseline differences, by chance. In addition, some of the value chain trainings that were held prior to the 2012–2013 survey could have led to treatment-control differences, even if random assignment were successful. Below, we summarize our findings on the extent to which the treatment and control groups were similar at the time of the survey, and the extent to which value chain trainings prior to the survey could be driving any differences.

The statistical tests in the previous chapters suggest that the treatment and control samples were broadly similar at baseline in most key characteristics and outcomes. Overall, the number of significant differences is no greater than one would expect by chance given the many characteristics and outcomes that we tested. However, given the importance of the specific outcomes for which differences were found, the evaluation will have to take these factors into account.

As we describe in Chapter III, one particularly important difference was in the specific targeted crops cultivated—farmers in the treatment sample were substantially more likely to cultivate targeted table grapes and substantially less likely to cultivate targeted vegetables relative to the control sample. We will take these relatively large (albeit not statistically significant) differences into account when interpreting our results. To the extent possible, we will also explore whether these differences might be driving the results by conducting additional exploratory analyses (for example, analyses by value chain).

More generally, we will control for targeted crops cultivated and other key characteristics when estimating final impacts. Regression controls will include farm operator characteristics that were significantly different at baseline (in particular, gender and education level of the farm operator), and key baseline outcomes that had large differences even though they were not significant (in particular, baseline farm profits).

The evidence also suggests that value chain trainings that took place prior to the survey likely did not lead to changes in practice use by the 2012 agricultural season. In the treatment sample as a whole, the overall pattern of practice use was very similar in the 2011 and 2012 seasons, making it unlikely that value chain trainings prior to the survey (but after the 2011 agricultural season) increased practice use in these communities. Even focusing on specific communities in which pre-survey value chain trainings were conducted, differences in practice use and knowledge were not consistently higher relative to control communities across value chains, and were similar to the patterns in 2011.

There are several possible reasons why value chain trainings prior to the survey, although relatively common, did not appear to have affected practice use during the 2012 agricultural season. First, trainings may have occurred too late in the agricultural season to influence practice adoption during the current season. Second, *intensive* trainings (a full sequence of three or more sessions in a community) were less common than one or two trainings by the time of the survey. Third, the fraction of sampled farmers attending value chain trainings in communities in which they were held was relatively low according to self-reports of attendance at ACED-sponsored trainings. Finally, there may be other barriers to using practices, so that increases in use might take longer to manifest. Regardless, value chain trainings that occurred prior to the survey do not seem to argue against the use of the 2012–2013 Farm Operator Survey to adjust for baseline differences between treatment and control communities in the impact analysis.

B. Updated minimum detectable impacts

In our design report (Fortson et al. 2012), we computed MDIs for the randomized design based in part on parameters from the 2008 Farm Operator Survey (administered during compact development) and previous studies. Using the 2012–2013 Farm Operator Survey, we can revise our MDI calculations based on more up-to-date parameter estimates. These revisions also take into account the reduction in sample size from eliminating one stratum that had virtually no control farmers, as described in Chapter I. The revised calculations (Table IX.1) focus on outcomes of greatest interest to the Millennium Challenge Corporation.

Table IX.1. Updated minimum detectable impacts for the value chain training evaluation

	Specific Practice Used (percentage points)[a]	Number of Practices Used (number)	Area Under Improved Practices (hectares)[b]	Gross Margin per Hectare (dollars)[c]	Annual Agricultural Profits (dollars)[d]	Annual Household Consumption (dollars)[e]
Estimated baseline mean	17.6	5.3	5.7	1,359	860	3,384
Standard deviation	38.1	4.7	40.6	4,201	11,069	2,615
Minimum detectable impact (MDI)	**13.7**	**3.2**	**13.1**	**1,225**	**2,571**	**871**
MDI as percentage of baseline mean	78%	60%	229%	90%	299%	26%

Source: Authors' calculations using data from the 2012–2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: MDIs are for a two-tailed test with 80 percent power and a 95 percent level of significance. We assume an 85 percent follow-up response rate for the baseline sample, yielding sample sizes of 767 for the 41 treatment communities and 479 for the 28 control communities in the analysis sample. The calculations use intraclass correlations (ICCs) estimated from the 2012–2013 Farm Operator Survey: 0.115 for use of a specific practice, 0.550 for number of practices used, 0.080 for area on which practices were applied, 0.055 for gross margin per hectare, 0.013 for agricultural profits, and 0.090 for consumption. The calculations assume a regression R-squared of 0.4. Monetary amounts were converted from Moldovan lei to U.S. dollars using the average exchange rate in 2012, which was 0.08418 dollars per lei (www.oanda.com). We assume that 70 percent of sampled farmers in treatment communities and 10 percent of sampled farmers in control communities attend value chain trainings.

[a]Parameters are based on mean percentage use and mean ICC across all practices included in the 2012–2013 Farm Operator Survey.

[b]Based on the maximum area on which each farmer applied any practice for a given targeted value chain. If multiple targeted value chains were cultivated by a farmer, the maximum areas for the different value chain were summed.

[c]Defined as revenues from all crops minus total expenditures, divided by area cultivated.

[d]Restricted to small and medium farms only.

[e]Defined for small and medium farms only.

The intermediate outcomes of greatest relevance to the evaluation involve the use of the improved agricultural practices covered by the value chain trainings. Our MDI calculations focus on three measures of practice use: (1) the percentage of farmers using a specific practice, (2) the mean number of practices used, and (3) the mean land area on which improved practices are applied. The MDI for the use of a specific practice depends on the percentage of farmers using that practice at baseline. However, for ease of presentation, we used the mean practice use across all practices included in the Farm Operator Survey (18 percent) as illustrative of the typical practice. The calculations suggest that we will be able to detect an impact of about 14 percentage points or above for use of this typical practice (78 percent of the baseline treatment mean). For the total number of practices captured in the Farm Operator Survey that were used, we estimate that we will be able to detect an increase in the mean of about 3.0 practices (60 percent of the baseline treatment mean) or above. The area on which practices are applied is more variable than the measures of practice use, and we will therefore likely be able to detect an impact of only 13.1 hectares (229 percent of the baseline treatment mean) or above.

The remaining outcomes for which we calculated MDIs are related to farm or household well-being. The MDI for gross margin per hectare is $1,225, or 90 percent of the estimated baseline mean in the treatment sample. For farm profits and consumption, we restricted our calculations to small and medium farms.[51] The MDI for farm profits is $2,571, or 299 percent of the baseline treatment mean. These MDIs suggest that we will be able to detect only very large impacts on gross margin per hectare and farm profits. Because consumption had much lower variance than those measures of well-being, the MDI is much smaller at $871 (26 percent of the baseline treatment mean).

In the MDI calculations, we assume that 70 percent of treatment group farmers and 10 percent of control group farmers will attend value chain trainings. However, our analysis of value chain training participation rates in communities in which these trainings have already been conducted (described in Chapter VII) suggests that training rates may be substantially lower. If training rates in treatment communities are lower than expected, the MDIs could increase substantially (for example, if only 40 percent of treatment farmers and 10 percent of control farmers are trained, the MDIs would double). Therefore, the ability of the evaluation to detect meaningful impacts hinges on the training rates of farmers in our sample.

C. Plans for future data collection

To allow sufficient time for impacts on key outcomes to materialize, the impact evaluation will draw on follow-up Farm Operator Survey data collected in late 2018 or early 2019, covering the 2018 agricultural season. These data will be collected from the same farm operators included in the 2012–2013 sample. The evaluation will also draw on additional qualitative data collection, which we expect to include stakeholder interviews (in 2015) as well as interviews and focus groups with farm operators (in 2018–2019). The follow-up data will enable the evaluation to rigorously estimate the impact of the value chain trainings on key outcomes, while the qualitative data will provide important insight into to how and why these estimated impacts did or did not occur.

[51] For farm profits, including large farms led to a standard deviation that was an order of magnitude larger, and to an MDI of more than 1,500 percent of the baseline mean. Household consumption did not apply for large farms, because those farms are not operated by households. Estimating impacts on these measures of well-being for small and medium farms could lead to underestimating the impact of value chain trainings if large farms experience large impacts.

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APPENDIX A

TECHNICAL APPENDIX

A. Sampling approach

As described in Chapter I, the Farm Operator Survey sample includes farm operators who cultivated crops that were expected to be targeted for value chain trainings (or, in communities not receiving training, that would likely have been targeted if the community had been selected for training). Below, we describe the construction of the sampling frame, the steps we used to draw the sample for farms of different sizes, and how replacements were selected when sampled farmers were not available for interviews.

1. Sample frame

For the sample frame, the survey contractor developed a list of all farm operators cultivating crops in targeted value chains in the 80 study communities (treatment and control) and 8 A-list communities (high priority sites that were purposefully selected to receive training).[1] This list included information about farm size and which of the targeted crops the farm operator cultivated.[2,3] In three communities, the survey contractor did not identify any farmers cultivating targeted crops, so the final sample frame included 77 study communities and 8 A-list communities.[4] Information on total farm size was used to draw separate samples for farms of different sizes.

2. Drawing the sample

For **small farms** (less than 10 hectares), we drew a random sample of farm operators in targeted value chains in each community. To determine the number of farmers to select in each community and to select farmers, we implemented the following steps:

[1] Operators that farm only "garden/*intravilan*" plots were excluded from the listing.

[2] For the vegetable value chain, the survey contractor only listed farmers who cultivated targeted vegetables in a greenhouse, because greenhouse cultivation was expected to be the main focus of the trainings in this value chain. To avoid including farmers with very small-scale vegetable cultivation (who would be unlikely to attend value chain trainings), the survey contractor only listed farmers who cultivated targeted vegetable crops in a greenhouse larger than 100 square meters.

[3] After the survey contractor developed this list, we discovered that, in several communities, there were few or no farmers in targeted value chains. In these cases, the survey contractor listed farmers in targeted value chains in neighboring communities that we refer to as "supplemental communities," and we collected data from these farmers. However, we subsequently decided to drop the supplemental communities from our analysis because our preliminary analysis of training participants in communities in which training had already been conducted suggested that few training participants came from outside the community. Therefore, including supplemental communities would likely dilute the training rate in the treatment group on which our design relies, adversely affecting our ability to detect impacts. Because the supplemental communities were not used in the analysis and the sampling in these communities did not affect the sampling in the original communities, we omit them from our sampling discussion.

[4] The three communities with no eligible farmers at listing included two control communities (one each in strata 1 and 8) and one treatment community (in stratum 7). In an additional two treatment communities (one each in strata 1 and 8), there were no valid completed interviews.

- **We allocated the total small-farm sample across communities in proportion to their size (the number of small-farm operators in targeted value chains).** For example, if one community had twice as many treatment small-farm operators as another, we allocated twice as many small-farm operators to that community. To ensure that very small communities were adequately represented and that very large communities do not drive the impact estimates, no community's sample could be below a minimum of 20 or above a maximum of 150 small farmers.[5] Allocating the sample in this way ensured that the sample was balanced across communities but still close to self-weighting.
- **We drew the sample in each community using implicit stratification by value chain.** We used implicit stratification by value chain (sorting farmers in each community by value chain and selecting the sample so that it was evenly spread across this ordered list) to ensure that the randomly-selected sample provided proportional representation of the different value chains in each community.

For **medium** (between 10 and 100 hectares**)** and **large** (100 hectares or larger) farms, we determined that there were relatively few farms in the value chain training sample frame (174 medium farms and 77 large farms). We therefore attempted to interview all operators of these farms so that we would have precise estimates for these groups.

3. Use of replacements

In some cases, the survey contractor was unable to conduct an interview with a selected farm operator. This occurred for various reasons, such as refusal to participate or ineligibility for the survey (if it was determined that the operator did not cultivate the targeted value chains). To account for this, we developed a list of replacement farmers in each community at the same time that we selected our initial sample. Because all medium and large farmers were selected for the sample, the replacement list included only small farmers.[6] These procedures were designed to help ensure that we reached our target sample sizes for the analysis while maintaining the representativeness of the sample to the extent possible and keeping the replacement procedure reasonably straightforward.

B. Analysis weights

Our sampling strategy attempted to create a survey sample that was as close to self-weighting as possible. However, we still need to apply weights to ensure that our analysis sample is representative of farm operators in the targeted value chains in the treatment and control communities. We constructed weights to account for:

- **Differences in sampling probabilities across farmers.** We drew the sample of eligible small farmers using implicit stratification in each community. The sampling probability for small farmers in a given community was therefore determined by the fraction of small farmers sampled in that community. Because the community allocations were roughly

[5] In total, there were 52 communities that had fewer than 20 eligible small farmers; the maximum of 150 was enforced in 5 communities.

[6] Many communities did not have any additional eligible small farmers beyond those included in the primary sample. Therefore, only some communities had a replacement list.

proportional to the number of eligible farmers in each community (except for small deviations due to the minima and maxima we imposed), this sampling probability was similar for most small farmers. Nevertheless, we need to adjust for the small deviations in this probability. We surveyed all medium and large farmers; therefore, their sampling probability was one. The inverse of the sampling probability was used to obtain a farm-level sampling weight for each farmer.

- **Possible differential nonresponse across different types of farmers.** To adjust for possible systematic nonresponse among certain types of farmers, we computed response rates within cells that we defined by random assignment stratum, treatment status, and farm size (small, medium, or large). We used the inverse of the response rate to obtain a nonresponse weight for all farmers in a given cell.[7]

We then multiplied these weights to yield preliminary farm-level weights. In addition, to ensure that treatment status was not correlated with random assignment stratum, we reweighted the control farms in each stratum so that their (weighted) sum was equal to the (weighted) sum of treatment observations in that stratum.[8] Finally, we normalized these adjusted weights so that their sum was equal to the number of observations for each farm size group (small, medium, and large).

C. Analysis approach

In our analysis of the Farm Operator Survey, we examine key characteristics and outcomes in the treatment sample and compare them to the control sample. To estimate levels in the treatment sample, we simply applied the weights described above. To compare levels between treatment and control samples, we estimated the differences between the two samples using the following ordinary-least-squares regression model, applying the weights described above:

$$(1) \quad Y_{ij} = \alpha + \beta T_j + \delta_k + \nu_j + \varepsilon_{ij}$$

where Y_{ij} is the outcome for farm operator i in community j; T_j is an binary indicator that is one for treatment communities and zero for control communities; δ_k is a set of binary indicators, one for each random assignment stratum, k; and ν_j and ε_{ij} are random error terms at the community and individual levels respectively.[9] The coefficient β gives the difference in the outcome between the treatment and control group.

[7] Response rates ranged from 44 percent to 100 percent across cells, with a mean of 88 percent and a median of 92 percent. These rates varied across all the dimensions considered, namely farm size, random assignment stratum, and treatment status.

[8] Our analysis controlled for stratum, so this was not strictly necessary. However, this makes it simpler for us—and future data users—to compute descriptive statistics.

[9] In the case of a binary outcome (for example, whether a farmer has access to irrigation), equation (1) is termed a linear probability model. Although probit or logit models are often used for binary outcomes, we prefer the linear probability model because it is easier to interpret and relies on weaker parametric assumptions. In practice, the probit or logit and linear probability models generally yield similar results for the types of marginal effects that we are estimating here (Angrist and Pischke 2008; Wooldridge 2010).

This regression model enabled us to account for the features of the evaluation design, specifically the stratified random assignment, through the inclusion of δ_k. In addition, because the unit of random assignment is the community, to obtain the correct standard error for the differences β we had to account for the fact that outcomes in the same communities are likely correlated. (This correlation is reflected in the community-level error term, v_j.) The regression model enabled us to account for this using the "cluster" correction in Stata, with the community as the level of clustering.

Although most of the analyses in this report were estimated using the approach described above, there were some exceptions:

- **Analyses by community training status in Chapter VII.** These analyses involve comparing training participation, agricultural practice use, and knowledge in treatment communities that received training before a given date and treatment communities that did not receive training by this date. To estimate the statistical significance of these differences, we estimated a version of equation (1) that restricted the sample to treatment communities and replaced the treatment indicator T_j with a binary indicator for being in a trained treatment community (T_{TRAINj}). Because several random assignment strata only included treatment communities of one type (trained or untrained), we omitted the stratum fixed effects from the analysis.
- **Gender analyses in Chapter VIII**. Some of these analyses did not involve testing differences between treatment and control communities. Rather, they involved testing for differences between male- and female-operated farms, or between spouse responses for the same farm, restricted to treatment communities. To test for differences between male- and female-operated farms, we estimated versions of equation (1) where T_j is an indicator for a female-operated farm and δ_k is a set of binary indicators, one for each community. To test for differences between spouse responses, we restricted the analysis for each variable to farms in which both spouses responded to the relevant question, and estimated versions of equation (1) where T_j was an indicator for the respondent (as opposed to the spouse). We included farm fixed effects as δ_k in these spouse analyses, to make the comparison explicitly between spouses in the same farm.[10]
- **Analyses of A-list communities in Appendix B.** In Appendix B we estimate the differences in characteristics between farmers in treatment communities and those in A-list communities. These differences are estimated using equation (1), but the sample is restricted to treatment and A-list communities. (T_j is therefore a binary indicator for a treatment community as opposed to an A-list community.) However, because the A-list communities were in their own separate stratum, we omitted the stratum fixed effects δ_k in these analyses (if they were included, they would be perfectly collinear with T_j and we could not estimate the model).

[10] Because these analyses were restricted to the universe of treatment communities, there was no sampling variation at the community level; therefore, it was not necessary to adjust for correlations within communities through a clustering correction.

Finally, we were concerned that the reported means of some continuous variables could be misleading if they included "outlier" values. These outliers could reflect errors in data collection, or just specific atypical cases. To a large extent, we have addressed this concern by also reporting other features of the distribution of these continuous variables (for example, the median, and/or specific categories of continuous values). However, since the Millennium Challenge Corporation is still interested in the means of these variables, we also sought to address the problem of outliers directly. Specifically, when reporting means of continuous variables, we top- or bottom-coded all values that were more than three standard deviations above or below the mean, respectively.[11] We implemented this correction separately by farm size—small, medium, and large—to avoid erroneously identifying values for larger farms as outliers.

[11] We considered other approaches to accounting for outliers, such as using a multiple of the inter-quartile range or the upper or lower percentiles as cutoff points. However, using standard deviations appeared to work best in providing a consistent approach that successfully identified outliers that were apparent by visual inspection, while leaving the rest of the distribution intact.

APPENDIX B

COMPARISON OF TREATMENT AND A-LIST COMMUNITIES

As discussed in Chapter I, the Farm Operator Survey sample included farmers in 8 A-list communities (high-priority sites that were purposefully selected for training), in addition to the randomly assigned treatment and control communities. This report focuses primarily on comparisons of the treatment and control communities because those comparisons are the basis of our impact evaluation design. In this appendix, we focus on comparisons between treatment communities and A-list communities.

These comparisons enable us to assess the extent to which the eventual impact evaluation results (which apply to treatment and control communities) are likely to generalize to the A-list communities. If the two types of communities are similar in key characteristics at baseline, the impact estimates are more likely to generalize. Some communities that will receive value chain trainings are outside of our sample (that is, they are not treatment, control, or A-list communities); therefore, this analysis does not assess the extent to which the results from the evaluation are likely to generalize to *all* communities that receive trainings.

Because the impact estimates will be based on the analysis sample, we focus on comparing the 8 A-list sample communities to the 41 treatment communities in our analysis sample (as described in Chapter I, the analysis sample excludes communities from one random assignment stratum that had very few controls). In the sections that follow, we compare crop cultivation, crop sales, training participation, practice knowledge and use, and measures of income of farms in the treatment and A-list communities.

A. Crop cultivation

Farms in the treatment sample are significantly larger, on average, than those in the A-list sample (Table B.1). The mean area cultivated in the treatment sample was 47 hectares, compared to only 8 hectares in the A-list sample. This is driven by a significantly higher proportion of medium (between 10 and 100 hectares) and large (100 hectares or more) farms in the treatment sample compared to the A-list sample.

Cultivation of targeted crops also differed substantially between the treatment and A-list samples. In particular, farmers in the A-list sample almost exclusively cultivated targeted table grapes and vegetables (in equal proportions), with very few farmers cultivating targeted stone fruits or nuts or targeted apples.[12] In contrast, cultivation in the treatment sample is more evenly divided across all targeted crops, although targeted table grapes and targeted vegetables were still the most common. Because very few farmers in the A-list sample cultivated targeted stone fruits or nuts or targeted apples, our subsequent analyses of outcomes by value chain are restricted to targeted table grapes and targeted vegetables.

[12] Three of the eight A-list communities included targeted table grape farmers, but the vast majority were located in just one community.

Table B.1. Cultivated area and cultivation of targeted crops (percentage of farms unless otherwise indicated)

	Treatment sample size	A-list sample size	Treatment	A-list	Difference	*p*-Value
Area cultivated, all cultivation						
Total area cultivated per farm	898	200				0.00***[a]
<1 ha			25.2	41.2	-16.0	0.29
≥1-<5 ha			52.9	53.1	-0.3	0.98
≥5-<10 ha			8.1	2.5	5.6	0.01**
≥10-<100 ha			9.4	2.2	7.3	0.00***
≥100 ha			4.4	1.0	3.4	0.04**
Median (ha)			1.7	1.1	--	--
Mean (ha)			46.9	7.8	39.2	0.02**
Cultivated targeted crops						
Stone fruits or nuts	902	200	16.0	1.4	14.6	0.03**
Apples	902	200	22.3	1.0	21.3	0.01**
Table grapes	902	200	26.0	45.2	-19.2	0.51
Vegetables	902	199	38.8	44.4	-5.6	0.84

Source: 2012-2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table presents the average farm area cultivated and the percentage of farms cultivating each targeted crop. Stone fruits or nuts include peaches, plums, sweet cherries, almonds, and walnuts. Vegetables include tomatoes, cucumbers, sweet peppers, salad greens, and culinary herbs that were at least partially grown in a greenhouse. Cultivation of targeted crops only includes cultivation in communities in which a given crop was targeted. Farms that cultivated multiple targeted crops may appear in multiple rows in each panel. To account for outliers, area cultivated was trimmed at three standard deviations above and below the mean for each farm size category (small, medium, large). Percentages, means, and medians are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and A-list communities are estimated using an ordinary-least-squares regression. Reported *p*-values are adjusted for clustering at the community level.

[a] *p*-Value from a Pearson chi-squared test for equivalence of the treatment and control distributions, adjusting for clustering at the community level.

*/**/***Significantly different from zero at the .10/.05/.01 level, two-tailed test.

ha = hectares.

We also compared the treatment and A-list samples in other aspects of production—irrigation, cold storage, and farmer interaction and cooperation (Table B.2). Irrigation was used very infrequently among table grape farmers in both samples; it was more common for vegetable farmers. There were no statistically significant differences in the percentage of farmers irrigating targeted table grapes or targeted vegetables. Use of cold storage for table grapes was substantially higher in the A-list sample—63 percent compared to 1 percent in the treatment sample—although use of cold storage for vegetables is similar across samples. The prevalence of cold storage use in the A-list sample is driven by high rates in the one A-list community that included the vast majority of targeted table grape farmers. Membership rates in various farmer organizations were low in both samples, and the differences were not statistically significant. However, cooperation with other farmers in marketing and sales was more common in the A-list sample (83 percent compared to 58 percent in the treatment sample).

Table B.2. Features of agricultural production (percentage of farms)

	Treatment sample size	A-list sample size	Treatment	A-list	Difference	*p*-Value
Irrigated targeted crops						
Table grapes	228	79	0.6	0.0	0.6	0.37
Vegetables	353	83	92.3	79.8	12.5	0.46
Used cold storage for targeted crops						
Table grapes	227	83	1.0	63.0	-62.0	0.00***
Vegetables	350	83	0.3	2.7	-2.4	0.22
Interaction and cooperation with other farmers						
Member of						
Producer organization	888	200	12.1	8.0	4.2	0.28
Agricultural cooperative	886	200	3.9	3.1	0.8	0.80
Savings and credit association	884	200	16.4	11.0	5.4	0.20
Cooperated with other farmers to market and sell crops	891	192	58.1	83.1	-25.0	0.03**

Source: 2012-2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table presents irrigation and use of cold storage among farms cultivating a given crop in a community in which that crop was targeted, and measures of farmer interaction and cooperation for all farms in the sample. Vegetables include tomatoes, cucumbers, sweet peppers, salad greens, and culinary herbs that were at least partially grown in a greenhouse. Reports by crop type are restricted to table grapes and vegetables because very few A-list farmers cultivated targeted stone fruits or nuts or targeted apples. Percentages are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and A-list communities are estimated using an ordinary-least-squares regression. Reported *p*-values are adjusted for clustering at the community level.

*/**/***Significantly different from zero at the .10/.05/.01 level, two-tailed test

B. Crop sales

For targeted grapes, the pattern of crop sales was different in treatment and A-list communities, but the pattern was similar for targeted vegetables (Table B.3). The mean volume of table grapes sold was substantially higher in treatment communities (about 19 metric tons compared to about 4 metric tons in A-list communities, although the difference was not statistically significant), while the price received for table grapes was significantly lower (a difference of $172 per metric ton). The higher prices in A-list communities could be related to the more common use of cold storage described above. Overall, the substantially higher table grape sales volumes in treatment communities resulted in mean table grape revenues that were about five times higher than those in A-list communities. On the other hand, amounts sold, prices, and revenues were similar for targeted vegetables. Total mean revenues in the treatment sample (which, unlike the A-list sample, include a large contribution from targeted stone fruit or nut farmers and targeted apple farmers) were more than eight times higher than those in the A-list sample.

Table B.3. Agricultural sales

	Treatment sample size	A-list sample size	Treatment	A-list	Difference	*p*-Value
Average amount sold (mean, metric tons)						
Table grapes	226	84	18.58	3.79	14.80	0.11
Vegetables	342	82	4.50	5.32	-0.82	0.36
Average price per ton (mean, dollars)						
Table grapes	213	74	425	597	-172	0.00***
Vegetables	339	82	550	525	25	0.78
Average agricultural revenue (mean, dollars)						
Among farms cultivating:						
Table grapes	226	83	8,538	1,694	6,845	0.10
Vegetables	341	82	2,161	2,405	-244	0.54
Any targeted crop[a]	866	183	36,704	4,254	32,450	0.01**

Source: 2012-2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table presents measures of agricultural sales among farms cultivating a given crop in a community in which that crop was targeted. Vegetables include tomatoes, cucumbers, sweet peppers, salad greens, and culinary herbs that were at least partially grown in a greenhouse. Reports by crop type are restricted to table grapes and vegetables because very few A-list farmers cultivated targeted stone fruits or nuts or targeted apples. Prices and revenues were converted from Moldovan lei to U.S. dollars using the average exchange rate in 2012, which was 0.08418 dollars per lei (www.oanda.com). To account for outliers, all variables were trimmed at three standard deviations above and below the mean for each farm size category (small, medium, large). Means are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and A-list communities are estimated using an ordinary-least-squares regression. Reported *p*-values are adjusted for clustering at the community level.

*/**/***Significantly different from zero at the .10/.05/.01 level, two-tailed test

[a]Includes farmers who cultivate targeted stone fruit or nuts or targeted apples

C. Training participation and practice knowledge and use

Because training participation is a key output of the value chain training, we compared reported participation in agricultural trainings in the year prior to the Farm Operator Survey in the treatment and A-list samples. Farmers in the treatment sample were substantially more likely to have participated in an agricultural training (41 percent compared to 14 percent in the A-list sample), but self-reported participation in ACED-provided trainings was similar in the two samples at around 10 percent (Table B.4). This suggests that a larger proportion of trainings that were attended by farmers in the A-list sample were value chain trainings—consistent with the fact that many value chain trainings were held in A-list communities before the 2012-2013 survey was fielded.

Knowledge and use of agricultural practices covered in value chain trainings—a key intermediate outcome for the evaluation—were similar across the treatment and A-list samples for targeted vegetable practices, but different for targeted table grape practices. Specifically, targeted table grape farmers in the treatment sample knew significantly more practices (a mean of about 9 practices compared to about 3 in the A-list sample) and also used more of them in the 2012 agricultural season (a mean of about 3 practices compared to about 2). Use of targeted table grape practices was similar in the 2011 agricultural season, suggesting that the difference in use predates the value chain trainings and might be related to the higher prevalence of other training activities in these communities described above.

Table B.4. Training participation, practice knowledge, and practice use

	Treatment sample size	A-list sample size	Treatment	A-list	Difference	*p*-Value
Training participation (percentage of farms)						
Participated in any training in past 12 months	889	195	40.6	14.4	26.2	0.03**
Participated in any ACED training in past 12 months, self-report	828	192	10.9	10.0	0.9	0.91
Practice knowledge and use (mean)						
Number of practices known						
Table grapes	226	83	9.3	2.9	6.4	0.02**
Vegetables	326	79	11.8	11.1	0.7	0.85
Number of practices used						
Table grapes						
2012	228	84	3.2	1.8	1.4	0.01***
2011	228	83	3.2	1.7	1.5	0.00***
Vegetables						
2012	352	80	8.0	7.7	0.4	0.85
2011	345	82	7.7	7.2	0.5	0.84

Source: 2012-2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table presents training participation and practice knowledge and use; for practice knowledge and use, the sample includes only farms cultivating a given crop in a community in which that crop was targeted. Practice knowledge and use are only reported for table grapes and vegetables because very few A-list farmers cultivated targeted stone fruits or nuts or targeted apples. Vegetables include tomatoes, cucumbers, sweet peppers, salad greens, and culinary herbs that were at least partially grown in a greenhouse. Percentages and means are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and A-list communities are estimated using an ordinary-least-squares regression. Reported *p*-values are adjusted for clustering at the community level.

*/**/***Significantly different from zero at the .10/.05/.01 level, two-tailed test.

D. Farm profits, household income, and consumption

Finally, we compared farms in treatment and A-list communities on several measures of farm and household wellbeing—farm profits, household income, and consumption (Table B.5). Mean farm profits in the treatment sample were almost double those in the A-list sample ($3,216 compared to $1,672), but the difference was not statistically significant due to the high variability of profits. The distribution of farm profits was, however, significantly different. The largest difference in the distribution was in the proportion reporting very high profits (more than $2,500); about one in four treatment sample farmers fell in this category, compared to only one in ten A-list sample farmers. Mean household income (available for small and medium farms only) was also significantly higher in the treatment sample compared to the A-list sample. In contrast, mean consumption was very similar, but the distribution of consumption was significantly different.

Table B.5. Farm profits, household income, and annual consumption (percentage of farms unless otherwise noted)

	Treatment sample size	A-list sample size	Treatment	A-list	Difference	*p*-Value
All farms						
Farm profits	861	183				0.00***[a]
≤$0			28.0	26.6	1.4	0.88
>$0-<$250			7.5	19.0	-11.5	0.00***
≥$250-<$500			7.4	14.8	-7.4	0.03**
≥$500-<$1,000			11.0	12.8	-1.9	0.63
≥$1,000-<$2,500			20.7	17.4	3.3	0.55
≥$2,500			25.4	9.3	16.1	0.01***
Median (dollars)			835	303	--	--
Mean (dollars)			3,216	1,672	1,544	0.87
Small and medium farms						
Total household income	835	179				0.00***[a]
≤$0			7.2	4.8	2.4	0.32
>$0-<$1000			6.9	16.8	-9.9	0.01**
≥$1,000-<$2,500			19.1	36.4	-17.4	0.00***
≥$2,500-<$5,000			29.8	28.7	1.1	0.78
≥$5,000			37.0	13.2	23.8	0.00***
Median (dollars)			3,770	2,197	--	--
Mean (dollars)			4,366	2,785	1,581	0.05**
Total annual consumption	661	172				0.00***[a]
<$1,000			8.3	16.8	-8.5	0.37
≥$1,000-<$2,500			34.8	23.1	11.7	0.26
≥$2,500-<$5,000			38.2	33.9	4.3	0.70
≥$5,000			18.6	26.1	-7.5	0.39
Median (dollars)			2,778	3,199	--	--
Mean (dollars)			3,384	3,740	-356	0.66

Source: 2012-2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table presents annual farm profits for all farms, as well as household income and the value of annual household consumption for small and medium farms. Household income is computed as the sum of farm profits and non-farm income. Total consumption is computed as the sum of consumption expenditure and the value of consumption out of production. Large farms are omitted from household income and consumption because they operate as businesses, so these concepts are not relevant. Profits, income, and consumption were converted from Moldovan lei to U.S. dollars using the average exchange rate in 2012, which was 0.08418 dollars per lei (www.oanda.com). To account for outliers, all variables were trimmed at three standard deviations above and below the mean for each farm size category (small, medium, or large). Percentages, means, and medians are weighted using weights that adjust for sampling probabilities and survey nonresponse. Differences between treatment and A-list communities are estimated using an ordinary-least-squares regression. Reported *p*-values are adjusted for clustering at the community level.

[a] *p*-Value from a Pearson chi-squared test for equivalence of the treatment and control distributions, adjusting for clustering at the community level.

*/**/***Significantly different from zero at the .10/.05/.01 level, two-tailed test.

E. Discussion

Overall, the A-list sample is significantly different from the treatment analysis sample in several important dimensions. First, the pattern of targeted crops cultivated is different, with the A-list sample almost exclusively cultivating table grapes and vegetables while a substantial proportion of the treatment sample also cultivated stone fruits or nuts and apples. Second, the A-list sample farms were much smaller on average, and included a much lower proportion of medium and large farms. Third, treatment sample farms were more likely to have participated in agricultural trainings; baseline knowledge and use of targeted table grape practices were also more common in the treatment sample. Fourth, some measures of farm and household wellbeing, including farm profits, household income, and consumption, were significantly higher in the treatment sample. Overall, the results suggest that caution is warranted in extrapolating the impact evaluation results to the A-list communities, and possibly to other communities that were purposefully selected as training sites.

APPENDIX C

KNOWLEDGE AND USE OF AGRICULTURAL PRACTICES

In Chapter V we described the knowledge and use of agricultural practices covered by value chain trainings, focusing on results for these practices in the aggregate, rather than looking at specific practices. However, information about specific practices could be useful in the design of future trainings. Therefore, below we report the levels of knowledge (Table C.1) and use (Table C.2) of each of the specific practices captured in the Farm Operator Survey, separately for the treatment and control samples (organized by targeted value chain).

Table C.1. Practice knowledge (percentage of farms)

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Stone fruits						
Intensive Orchard Systems	133	172	74.4	82.2	-12.9	0.36
Weather Stations	132	167	23.9	52.9	-38.0	0.02**
Drip Irrigation	133	172	75.4	80.1	-8.6	0.32
Water Testing	133	166	35.8	60.0	-37.5	0.00***
Fertigation	133	166	59.4	65.6	-16.0	0.17
Anti-Hail Net	132	167	54.0	48.7	-3.7	0.82
Anti-Rain Nets	132	167	31.0	40.2	-10.7	0.52
Frost Management	132	169	43.0	62.1	-16.7	0.42
Manual Thinning	132	169	83.9	89.4	-8.8	0.27
Summer Pruning	132	173	91.8	91.1	-4.2	0.58
Winter Pruning	133	173	100.0	96.6	3.8	0.17
Testing Bud Fertility	132	167	64.9	65.2	-1.7	0.92
Canopy Training	133	168	96.5	93.3	1.2	0.75
Horizontal Lining Of Bearing Branches	133	166	62.0	58.7	0.9	0.93
Picking Bags	131	169	22.5	53.2	-32.7	0.02**
Cold Storage	133	173	17.7	12.6	4.7	0.49
Humidity Or Temperature Control In Storage Areas	133	171	4.0	6.4	-5.1	0.36
Putting Crates Or Boxes On Pallets Or Using Corner Boards	133	171	3.0	4.6	-3.9	0.48
Ethylene Management (Smartfresh)	133	171	2.0	0.4	1.3	0.40
Implementing Controlled Atmosphere In Storage	133	171	2.0	6.0	-6.1	0.20
Temperature Or Humidity Control In Packing Areas	132	166	8.5	36.5	-34.2	0.03**
Modified Atmosphere/Modified Humidity Packaging	132	166	5.4	30.6	-30.1	0.05*
Tray Liners	132	165	5.9	16.1	-9.8	0.17
Open Trays	132	172	22.8	58.1	-22.4	0.24
Punnets	132	166	9.6	35.5	-31.0	0.08*
Pre-Cooling	132	165	16.5	45.9	-44.9	0.02**
Apples						
Implementing Intensive Orchard Systems	198	167	78.7	73.3	13.4	0.21
Weather Stations	198	162	50.7	34.6	18.4	0.37
Drip Irrigation	198	163	67.6	38.3	30.0	0.12
Water Testing	198	162	45.4	26.1	20.3	0.36
Fertigation	198	167	60.6	37.2	25.1	0.26

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Anti-Hail Net	198	167	64.1	35.8	30.1	0.12
Frost Management	197	166	80.8	51.0	26.0	0.04**
Integrated Disease And Pest Management	198	168	97.5	72.0	24.8	0.00***
Fruit Thinning To Increase Size Of Apples	198	161	71.2	59.9	8.0	0.59
Picking Bags	199	161	76.0	44.6	34.4	0.06*
Harvesting Platforms	199	161	58.3	32.6	29.4	0.13
Wood Containers For Harvest	199	159	92.0	80.2	14.8	0.01**
Plastic Containers For Harvest	199	159	79.1	62.3	22.8	0.05*
Color Charts	195	159	18.3	9.3	8.8	0.20
Penetrometers	195	159	12.3	1.6	11.1	0.00***
Cold Storage	199	163	56.1	13.5	55.5	0.02**
Humidity Or Temperature Control In Storage Areas	199	163	23.0	10.6	16.8	0.32
Putting Crates Or Boxes On Pallets Or Using Corner Boards	199	163	17.9	9.4	12.7	0.35
Ethylene Management (Smartfresh)	199	163	11.8	0.3	13.6	0.05**
Grading And Sorting Equipment	199	159	53.9	26.8	32.2	0.12
Humidity Or Temperature Control In Packing Areas	199	159	30.5	25.5	6.2	0.74
Modified Atmosphere/Modified Humidity Packaging	199	159	21.1	18.9	2.1	0.90
Tray Liners	199	159	12.9	16.1	-4.9	0.73
Open Trays	199	159	21.5	26.9	-5.5	0.77
Punnets	199	159	15.3	22.5	-7.9	0.67
Returnable Plastic Crates	199	159	23.3	26.9	-4.0	0.84
Pre-Cooling	199	159	28.5	23.2	5.7	0.79
Table grapes						
Cluster Thinning	228	163	88.1	88.4	3.4	0.49
Bark Girdling To Increase Grape Size	228	161	36.4	38.1	4.7	0.81
Growth Stimulators	228	162	52.1	39.7	21.0	0.30
Introducing New Varieties	228	163	80.4	58.8	30.0	0.02**
Weather Stations	228	161	33.6	20.5	20.0	0.37
Drip Irrigation	228	164	75.5	58.7	14.4	0.41
Water Testing	227	160	32.4	25.4	13.9	0.55
Fertigation	227	161	40.3	31.8	16.5	0.46
Anti-Hail Net	228	161	40.1	36.6	6.9	0.75
Frost Management	228	161	72.7	39.3	36.9	0.04**
Integrated Disease And Pest Management	228	163	89.7	96.1	1.1	0.80
Harvesting Platforms	227	161	26.9	14.8	17.1	0.35
Putting Crates/Boxes On Pallets/Using Corner Boards For Harvesting	228	160	23.8	14.4	14.4	0.44
Cold Storage	228	164	4.1	10.7	-5.7	0.38
Humidity Or Temperature Control In Storage Areas	228	164	1.0	4.6	-3.4	0.29

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Inner Packaging/Storage (Sulfur Pads)	228	164	0.5	3.4	-2.9	0.34
Room Cooling (Forced-Air)	228	164	0.5	3.4	-2.9	0.34
Pre-Cooling	228	164	0.5	3.4	-2.8	0.34
Putting Crates/Boxes On Pallets/Using Corner Boards For Packing	228	163	23.7	18.4	8.5	0.63
Modified Atmosphere/Modified Humidity Packaging	228	164	23.1	8.6	18.8	0.29
Water-Absorbent Pads	228	163	22.8	6.5	20.4	0.26
Open Trays	228	164	75.4	65.0	5.0	0.81
Punnets	227	161	24.2	8.0	21.3	0.24
Returnable Plastic Crates	228	163	61.4	33.3	19.9	0.33
Vegetables						
Seedling Production	346	84	85.2	67.7	25.2	0.12
Integrated Disease And Pest Management For Seedling	345	84	78.6	66.2	21.4	0.19
Micro Climate Control Systems In Greenhouses	346	84	53.2	51.4	15.7	0.45
Introducing New Varieties/Hybrids For Seedling Production	346	84	69.9	59.0	20.3	0.35
Pallets For Seedling Production Trays	346	84	39.2	43.4	10.9	0.55
Peat For Seedling Production	345	84	54.2	42.6	22.2	0.16
Drip Irrigation For Seedling Production	341	84	36.7	39.6	6.3	0.64
Water Testing For Seedling Production	346	84	17.3	30.9	2.3	0.81
Fertigation	338	84	28.4	39.2	6.4	0.52
Supplementary Illumination For Seedling Production	346	83	41.3	43.5	7.9	0.49
Energy Saving Techniques And Equipment For Seedling	344	83	13.5	35.0	-1.5	0.88
Bumblebees Or Other To Increase Tomato Pollination	343	83	36.3	30.6	22.0	0.01***
Micro Climate Control Systems In Greenhouses	345	84	54.3	55.0	19.9	0.34
Introducing New Varieties/Hybrids For Vegetable Production	345	84	85.6	53.3	47.4	0.01**
Mulching For Vegetable Production	343	84	22.1	34.7	0.8	0.94
Drip Irrigation For Vegetable Production	345	84	83.3	61.2	30.7	0.00***
Water Testing For Vegetable Production	344	84	27.3	35.8	10.0	0.29

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Fertigation For Vegetable Production	342	84	52.2	43.7	28.1	0.02**
Energy Saving Techniques And Equipment For Vegetable	344	84	21.4	44.4	-0.4	0.97
Growth Stimulators For Vegetable Production	344	84	67.7	45.1	44.0	0.00***
Support Systems For Vegetable Production	345	84	84.4	42.4	58.6	0.00***
Harvesting Platform	344	84	15.2	17.0	7.0	0.37
Plastic Boxes	345	84	44.4	67.6	-11.6	0.25
Putting Crates Or Boxes On Pallets Or Using Corner Boards	339	84	8.9	4.0	6.7	0.21
Tray Liners	342	83	9.3	1.9	8.0	0.13
Water-Absorbent Pads	337	83	9.5	1.9	7.6	0.14
Open Trays	343	84	43.4	33.8	25.9	0.00***
Punnets	341	84	17.4	5.5	13.8	0.01**
Returnable Plastic Crates	345	84	35.1	36.4	12.7	0.44

Source: 2012-2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table presents the percentage of farm operators who report knowing each agricultural practice for the specified crop group. Stone fruits include peaches, plums, and sweet cherries. Vegetables include tomatoes, cucumbers, sweet peppers, salad greens, and culinary herbs that were at least partially grown in a greenhouse. The sample includes farmers who cultivated a given crop in communities in which it was targeted. Knowledge of practices related to cold storage use and vegetable seedling production was not reported by respondents if cold storage was not utilized or seedlings were not produced, respectively, but was assumed to be zero. Percentages are weighted using weights that adjust for sampling probabilities and survey non-response. Differences between treatment and control communities are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Because of the regression adjustment, these treatment-control differences may not be equal to the raw differences. Reported *p*-values are adjusted for clustering at the community level.

*/**/***Significantly different from zero at the .10/.05/.01 level, two-tailed test.

Table C.2 Practice use in the 2011 and 2012 agricultural seasons (percentage of farms)

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Stone fruits						
Intensive Orchard Systems						
2012	133	171	8.3	32.8	-30.5	0.04**
2011	132	171	5.6	25.9	-24.0	0.15
Weather Stations						
2012	132	167	3.0	7.7	-2.1	0.72
2011	132	167	3.0	7.7	-2.1	0.72
Drip Irrigation						
2012	133	172	8.0	3.2	5.6	0.37
2011	132	170	5.4	2.2	3.7	0.49
Water Testing						
2012	133	166	2.0	3.4	-0.9	0.59
2011	133	166	2.0	3.4	-0.9	0.59
Fertigation						
2012	133	166	7.1	2.8	6.2	0.25
2011	132	166	7.7	1.8	8.7	0.13
Anti-Hail Net						
2012	132	167	0.0	0.8	-0.3	0.28
2011	131	167	0.0	0.9	-0.3	0.28
Anti-Rain Nets						
2012	132	167	0.0	0.8	-0.3	0.28
2011	132	167	0.0	0.9	-0.3	0.28
Frost Management						
2012	132	168	16.1	25.1	-8.2	0.57
2011	131	167	16.2	24.9	-7.3	0.62
Manual Thinning						
2012	132	168	52.9	63.8	-8.2	0.39
2011	131	167	53.1	69.4	-8.6	0.44
Summer Pruning						
2012	132	173	63.2	76.2	-17.3	0.06*
2011	131	171	68.1	81.5	-15.5	0.09*
Winter Pruning						
2012	133	173	88.5	89.9	-0.2	0.98
2011	132	172	94.0	94.8	1.9	0.53
Testing Bud Fertility						
2012	132	167	44.4	45.0	-4.2	0.77
2011	132	166	46.5	46.3	1.7	0.92
Canopy Training						
2012	133	166	83.5	85.3	-1.3	0.81
2011	132	164	84.1	87.0	0.2	0.97
Horizontal Lining Of Bearing Branches						
2012	133	165	15.4	28.0	-10.2	0.60
2011	133	164	15.4	27.5	-8.7	0.65
Picking Bags						
2012	131	169	2.0	5.7	-4.4	0.24
2011	131	169	6.0	12.2	-4.7	0.31
Cold Storage						
2012	133	173	5.1	2.8	0.0	1.00
2011	131	173	4.0	2.8	0.4	0.92

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Humidity Or Temperature Control In Storage Areas						
2012	133	173	3.1	2.8	-2.7	0.43
2011	133	173	2.0	2.8	-2.7	0.43
Putting Crates Or Boxes On Pallets Or Using Corner Boards						
2012	133	173	3.0	0.2	3.2	0.16
2011	133	172	3.0	0.2	3.2	0.16
Ethylene Management (Smartfresh)						
2012	133	173	2.0	0.0	1.9	0.14
2011	133	173	2.0	0.0	1.9	0.14
Implementing Controlled Atmosphere In Storage						
2012	133	173	2.0	0.0	1.9	0.14
2011	133	173	2.0	0.0	1.9	0.14
Temperature Or Humidity Control In Packing Areas						
2012	132	166	3.1	2.9	-2.7	0.43
2011	132	166	2.0	2.9	-2.7	0.43
Modified Atmosphere/Modified Humidity Packaging						
2012	132	166	1.0	0.0	1.0	0.14
2011	132	166	1.0	0.0	1.0	0.14
Tray Liners						
2012	132	165	1.0	0.2	0.9	0.17
2011	132	165	1.0	0.3	0.9	0.20
Open Trays						
2012	132	171	9.7	24.6	-10.0	0.42
2011	132	171	8.9	35.0	-15.4	0.20
Punnets						
2012	132	166	1.0	3.2	-4.1	0.28
2011	132	166	1.0	4.1	-4.7	0.25
Pre-Cooling						
2012	132	165	3.1	0.2	1.6	0.18
2011	132	165	2.0	0.0	2.0	0.14
Apples						
Implementing Intensive Orchard Systems						
2012	198	166	12.5	5.5	7.9	0.15
2011	197	155	9.2	3.5	5.7	0.29
Weather Stations						
2012	198	162	5.4	2.0	3.8	0.17
2011	197	161	3.1	2.0	1.8	0.44
Drip Irrigation						
2012	198	163	5.4	2.8	2.8	0.51
2011	196	161	5.0	2.8	2.1	0.62
Water Testing						
2012	198	162	5.7	0.0	7.1	0.05**
2011	196	161	5.8	0.3	6.9	0.06*
Fertigation						
2012	198	167	17.2	3.2	18.2	0.28
2011	196	165	16.5	2.8	17.6	0.27

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Anti-Hail Net						
2012	198	167	1.8	0.4	1.5	0.35
2011	196	166	2.3	0.0	3.2	0.16
Frost Management						
2012	197	166	23.6	8.0	17.6	0.05**
2011	196	163	21.6	4.8	18.2	0.04**
Integrated Disease And Pest Management						
2012	198	168	57.1	39.4	15.3	0.52
2011	197	164	53.1	28.4	23.9	0.27
Fruit Thinning To Increase Size Of Apples						
2012	198	160	23.0	13.0	15.0	0.33
2011	197	155	20.8	2.1	21.7	0.12
Picking Bags						
2012	199	160	19.9	7.5	18.7	0.24
2011	197	158	34.4	7.4	38.3	0.03**
Harvesting Platforms						
2012	198	160	28.9	7.1	28.6	0.13
2011	198	158	25.1	7.1	24.2	0.17
Wood Containers For Harvest						
2012	198	159	49.7	28.5	22.2	0.38
2011	197	146	55.1	19.3	44.3	0.01**
Plastic Containers For Harvest						
2012	198	159	9.6	9.3	-0.1	0.99
2011	196	150	9.5	9.0	1.6	0.83
Color Charts						
2012	195	158	3.8	1.6	2.9	0.38
2011	194	158	5.0	1.6	4.1	0.21
Penetrometers						
2012	195	159	0.5	0.0	0.6	0.32
2011	194	159	1.2	0.0	1.6	0.01***
Cold Storage						
2012	197	163	7.0	9.7	-1.5	0.87
2011	195	163	5.5	9.7	-4.0	0.67
Humidity Or Temperature Control In Storage Areas						
2012	199	163	5.1	9.7	-3.7	0.69
2011	198	163	4.1	10.0	-5.8	0.54
Putting Crates Or Boxes On Pallets Or Using Corner Boards						
2012	199	163	2.8	3.5	0.0	1.00
2011	198	163	2.9	3.5	0.0	0.99
Ethylene Management (Smartfresh)						
2012	199	163	2.2	0.0	2.9	0.13
2011	198	163	2.3	0.0	3.1	0.11
Grading And Sorting Equipment						
2012	199	159	2.2	3.6	-0.9	0.65
2011	192	157	2.5	1.6	1.3	0.56

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Humidity Or Temperature Control In Packing Areas						
2012	199	159	3.0	7.1	-2.6	0.53
2011	197	157	1.8	3.6	-0.9	0.84
Modified Atmosphere/Modified Humidity Packaging						
2012	199	159	0.0	2.0	-1.9	0.00***
2011	198	158	0.7	0.0	0.9	0.15
Tray Liners						
2012	199	159	0.0	0.4	-0.4	0.00***
2011	199	158	0.7	0.0	0.9	0.15
Open Trays						
2012	199	159	2.9	4.3	-0.5	0.92
2011	199	156	3.6	3.9	0.8	0.88
Punnets						
2012	199	159	0.5	4.3	-3.3	0.47
2011	199	158	1.6	3.8	-1.7	0.72
Returnable Plastic Crates						
2012	199	159	1.0	5.6	-4.3	0.48
2011	198	158	2.0	5.4	-3.0	0.64
Pre-Cooling						
2012	195	158	1.8	2.5	0.2	0.92
2011	199	157	2.2	0.0	2.7	0.04**
Table grapes						
Cluster Thinning						
2012	228	163	56.8	37.7	30.6	0.11
2011	228	163	53.7	57.3	6.0	0.63
Bark Girdling To Increase Grape Size						
2012	228	161	4.0	8.2	-3.4	0.30
2011	228	161	4.9	21.8	-15.9	0.12
Growth Stimulators						
2012	228	162	14.4	24.9	-8.1	0.65
2011	228	162	15.9	23.0	-4.4	0.77
Introducing New Varieties						
2012	228	163	17.1	4.3	16.6	0.05**
2011	228	162	19.8	3.9	20.4	0.01**
Weather Stations						
2012	228	161	4.5	7.0	-1.6	0.86
2011	228	161	4.8	7.0	-1.2	0.89
Drip Irrigation						
2012	228	163	0.9	8.6	-7.5	0.12
2011	228	163	1.3	11.1	-9.6	0.04**
Water Testing						
2012	227	160	0.6	4.8	-4.1	0.44
2011	227	160	0.6	4.8	-4.1	0.44
Fertigation						
2012	227	161	3.5	3.3	0.9	0.76
2011	227	161	5.3	3.8	2.6	0.43
Anti-Hail Net						
2012	228	161	0.0	0.0	0.0	
2011	228	161	1.0	2.2	-1.0	0.54
Frost Management						
2012	228	160	48.7	19.6	37.1	0.03**
2011	228	160	39.7	19.5	26.9	0.03**

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Integrated Disease And Pest Management						
2012	228	163	86.1	93.7	2.1	0.63
2011	228	163	81.5	91.6	-2.6	0.70
Harvesting Platforms						
2012	227	161	2.6	0.0	3.1	0.10*
2011	227	161	2.1	3.2	-0.7	0.85
Putting Crates Or Boxes On Pallets Or Using Corner Boards For Harvesting						
2012	228	160	0.9	4.9	-3.8	0.27
2011	228	160	0.9	8.3	-7.2	0.20
Cold Storage						
2012	228	164	1.0	4.9	-3.7	0.27
2011	228	164	0.8	4.4	-3.5	0.28
Humidity Or Temperature Control In Storage Areas						
2012	228	164	1.0	4.6	-3.4	0.29
2011	228	164	0.5	4.4	-3.8	0.23
Inner Packaging/Storage (Sulfur Pads)						
2012	228	164	0.5	2.7	-2.1	0.47
2011	228	164	0.5	2.7	-2.1	0.47
Room Cooling (Forced-Air)						
2012	228	164	0.5	0.6	0.0	0.99
2011	228	164	0.5	0.1	0.5	0.35
Pre-Cooling						
2012	228	164	0.5	3.2	-2.7	0.37
2011	228	164	0.5	2.8	-2.2	0.45
Putting Crates Or Boxes On Pallets Or Using Corner Boards For Packing						
2012	228	163	0.8	4.7	-3.8	0.26
2011	228	163	1.1	5.2	-3.9	0.25
Modified Atmosphere/Modified Humidity Packaging						
2012	228	164	0.9	0.0	1.1	0.21
2011	228	164	0.9	0.0	1.1	0.21
Water-Absorbent Pads						
2012	228	163	0.5	0.2	0.4	0.44
2011	228	163	0.5	0.0	0.6	0.21
Open Trays						
2012	228	164	44.5	23.2	10.2	0.61
2011	228	164	43.6	56.7	-24.5	0.39
Punnets						
2012	227	161	1.7	0.6	1.4	0.36
2011	227	161	1.2	0.6	0.9	0.47
Returnable Plastic Crates						
2012	228	163	28.6	10.9	23.2	0.15
2011	228	163	35.1	16.1	7.0	0.46

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
Vegetables						
Seedling Production						
2012	346	84	79.0	64.9	22.0	0.18
2011	346	84	76.7	57.3	28.8	0.10
Integrated Disease And Pest Management For Seedling Production						
2012	345	84	74.2	61.9	21.6	0.20
2011	346	84	71.0	58.8	21.4	0.18
Micro Climate Control Systems In Greenhouses						
2012	346	84	47.5	41.9	15.7	0.41
2011	346	84	48.1	38.0	18.8	0.34
Introducing New Varieties/Hybrids For Seedling Production						
2012	346	84	62.9	55.6	18.6	0.40
2011	346	84	60.1	54.2	14.8	0.50
Pallets For Seedling Production Trays						
2012	346	84	24.5	24.5	2.3	0.89
2011	345	84	24.3	23.1	2.5	0.88
Peat For Seedling Production						
2012	345	84	42.3	24.4	17.3	0.18
2011	345	84	39.8	20.5	17.0	0.18
Drip Irrigation For Seedling Production						
2012	341	84	13.8	16.6	-1.5	0.88
2011	341	84	13.2	13.8	-0.9	0.93
Water Testing For Seedling Production						
2012	346	84	1.3	14.2	-3.0	0.34
2011	346	84	0.9	6.9	-1.5	0.47
Fertigation						
2012	338	84	11.8	24.7	-1.5	0.86
2011	337	84	11.5	21.4	0.8	0.90
Supplementary Illumination For Seedling Production						
2012	346	83	17.0	16.6	-5.1	0.44
2011	346	84	15.1	12.6	-4.1	0.46
Energy Saving Techniques And Equipment For Seedling Production						
2012	344	83	4.3	6.9	2.2	0.56
2011	344	84	4.1	6.8	2.2	0.56
Bumblebees Or Other Techniques To Increase Tomato Pollination						
2012	343	83	8.3	3.0	5.1	0.06*
2011	343	83	8.4	3.0	5.5	0.05*
Micro Climate Control Systems In Greenhouses						

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
2012	345	84	42.1	40.3	15.5	0.41
2011	345	84	41.1	33.9	16.5	0.35
Introducing New Varieties/Hybrids For Vegetable Production						
2012	345	84	77.4	49.0	42.1	0.02**
2011	345	83	73.2	48.6	38.1	0.03**
Mulching For Vegetable Production						
2012	343	84	6.6	15.3	-5.6	0.43
2011	343	84	6.0	10.3	-4.7	0.48
Drip Irrigation For Vegetable Production						
2012	345	84	57.9	36.4	16.4	0.09*
2011	344	83	55.5	21.1	29.8	0.01***
Water Testing For Vegetable Production						
2012	344	84	3.6	12.4	-2.8	0.48
2011	344	84	2.6	14.9	-4.1	0.26
Fertigation For Vegetable Production						
2012	342	84	30.6	27.0	14.3	0.19
2011	342	84	30.8	25.8	15.5	0.13
Energy Saving Techniques And Equipment For Vegetable Production						
2012	343	84	5.0	16.5	0.0	1.00
2011	343	84	4.2	14.0	-0.4	0.91
Growth Stimulators For Vegetable Production						
2012	344	84	49.8	38.4	32.0	0.03**
2011	342	84	50.0	31.1	37.4	0.01**
Support Systems For Vegetable Production						
2012	345	84	74.8	19.1	63.0	0.00***
2011	345	84	74.5	18.5	59.9	0.00***
Harvesting Platform						
2012	344	84	1.5	0.0	1.7	0.22
2011	343	84	1.2	0.0	1.2	0.35
Plastic Boxes						
2012	345	84	29.3	50.7	-10.1	0.31
2011	344	84	25.0	38.1	-5.6	0.50
Putting Crates Or Boxes On Pallets Or Using Corner Boards						
2012	339	84	0.7	1.4	0.6	0.45
2011	338	84	0.7	0.0	1.0	0.17
Tray Liners						
2012	342	83	0.8	0.0	1.1	0.14
2011	342	83	0.5	0.0	0.5	0.12
Water-Absorbent Pads						
2012	337	83	4.5	0.0	4.8	0.28
2011	337	83	4.7	0.0	4.7	0.28
Open Trays						
2012	343	84	28.5	9.5	19.4	0.01***
2011	343	84	27.2	9.5	17.9	0.02**
Punnets						

	Treatment Sample Size	Control Sample Size	Treatment	Control	Adjusted Difference	*p*-Value
2012	341	84	4.9	0.0	5.1	0.00***
2011	339	84	2.7	0.0	2.7	0.01**
Returnable Plastic Crates						
2012	345	84	23.8	25.3	6.0	0.66
2011	345	84	22.8	23.6	6.3	0.65

Source: 2012-2013 Moldova Farm Operator Survey, Value Chain Training Evaluation Sample.

Note: Table presents the percentage of farms that report using each agricultural practice for the specified crop group. Stone fruits include peaches, plums, and sweet cherries. Vegetables include tomatoes, cucumbers, sweet peppers, salad greens, and culinary herbs that were at least partially grown in a greenhouse. The sample includes farmers who cultivated a given crop in the 2012 agricultural season in communities in which it was targeted. Use of practices related to cold storage use and vegetable seedling production was not reported by respondents if cold storage was not utilized or seedlings were not produced, respectively, but was assumed to be zero. Percentages are weighted using weights that adjust for sampling probabilities and survey non-response. Differences between treatment and control communities are estimated using an ordinary-least-squares regression that controls for stratum fixed effects. Because of the regression adjustment, these treatment-control differences may not be equal to the raw differences. Reported *p*-values are adjusted for clustering at the community level.

*/**/***Significantly different from zero at the .10/.05/.01 level, two-tailed test.

APPENDIX D

SMALL AND MEDIUM FARM QUESTIONNAIRE

Questionnaire #

MOLDOVA SMALL AND MEDIUM SIZED FARM BASELINE (2012)

Introduction speech:

[Interviewer presents himself, explains what the survey is about; DOES NOT state that it is linked to a potential irrigation project or training program. Tell the respondent that the survey aims to study condition of farmer in Moldova and identify their needs and problems. The survey in being conducted by the Non Governmental Organization Agribusiness Development Institute (ADI, Moldova) and will be of longitudinal character. So the follow up contacts will occur in future years.**]**

a. Direction on administering the questionnaire; explain the survey is voluntary and confidential.

	Name	**Code**
Q 1. Region		
Q 2. District/rayon		
Q 3. Settlement/ village		

INTERVIEWER VISITS				
		Q 4. Visit 1	**Q 5.** Visit 2	**Q 6.** Visit 3 - final
1. Date *[DD] [MM] [YYYY]*		[_ _] [_ _] [_ _ _ _]	[_ _] [_ _] [_ _ _ _]	[_ _] [_ _] [_ _ _ _]
2. Interviewer		name: _ _ _ _ _ _ _ ID: _ _ _ _ _	name: _ _ _ _ _ _ _ ID: _ _ _ _ _	name: _ _ _ _ _ _ _ ID: _ _ _ _ _
3. Interview time	Start *[HH] [MM]*	[_ _] [_ _]	[_ _] [_ _]	[_ _] [_ _]
	End *[HH] [MM]*	[_ _] [_ _]	[_ _] [_ _]	[_ _] [_ _]
4. Visit result		[_ _]	[_ _]	[_ _]
5. Appointment for the next visit	Date *[DD] [MM] [YYYY]*	[_ _] [_ _] [_ _ _ _]	[_ _] [_ _] [_ _ _ _]	
	Time *[HH] [MM]*	[_ _] [_ _]	[_ _] [_ _]	
	Location	_ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _	

Interview result codes:

Interview completed	1	
No one home	2	***Make next appointment***
Farmer not available	3	***Make next appointment***
Incomplete	4	
Refused	5	
No eligible farmer in HH	6	
Household not located	7	
Other (Specify) _ _ _ _ _ _		

Q 7. Spouse interview result: **To be completed after interview:**

Spouse is not present	1
Spouse is present but not available	2
Spouse is present but refuses to participate	3
Farm operator does not have a spouse	4
Spouse interview incomplete	5
Spouse interview completed	6
Other (specify) _ _ _ _ _ _ _ _	

To be completed after interview:

	Name	**ID**
Q 8. Regional Coordinator		
Q 9. District Coordinator		
Q 10. Field Manager		
Q 11. Revision Specialist		
Q 12. Data entry clerk #1		
Q 13. Data entry clerk #2		

Q 14. Quality control result: **To be completed after interview:**

Quality control procedure was conducted	1	Date: [_ _] [_ _] [_ _ _ _]
Quality control procedure was not conducted	2	

VERSION A

		Name / text	Code
X. 1	CIS		
X. 2	Cadastral code		
X. 3	Plot area		
X. 4	Plot owner		
X. 5	Farm area		
X. 6	Farm operator/respondent		

Before beginning the survey, I would like to ask you a question to determine if you are eligible to complete the survey.

I'd like to learn more about *this* plot of land. [Interviewer: show the respondent the cadastral code and point out the plot on a map.]

Screener1. During the 2012 agricultural season, did your farm operation operate on this plot?

Yes, my farm operation cultivated crops on this plot	1	***"You are eligible to complete the survey." Continue***
Yes, my farm operation operated this plot, even though it was uncultivated	2	***"You are eligible to complete the survey." Continue***
No, I did not have control over what happened on this plot	3	***Mark as not eligible in Q4-Q6; ask field supervisor to provide replacement***
Refused	89	***Code interview result as refusal (Q4-Q6); ask field supervisor to provide replacement***
Don't know	99	***Code interview result as "other"; Ask field supervisor to provide replacement***

VERSION B

		Name / text	Code
X.5	Farm area		
X.6	Farm operator/respondent		

Before beginning the survey, I would like to ask you a question to determine if you are eligible to complete the survey.

Screener2. I'd like to ask about the crops that your farm operation cultivated during the 2012 agricultural season. Did your farm operation cultivate any of the following in a field: apples, plums, peaches, sweet cherries, almonds, walnuts, table grapes? Or did your farm operation cultivate any of the following in a greenhouse: tomatoes, cucumbers, peppers, salad greens, or culinary herbs?

Yes (at least one)	1	***"You are eligible to complete the survey." Continue***
No	2	***End interview, code as 6 (ineligible) in Q4-Q6; ask field supervisor to provide replacement***
Refused	89	***End interview, code as 5 (refused) in Q4-Q6; as field supervisor to provide replacement***
Don't know	99	***End interview, code as other in Q4-Q6; ask field supervisor to provide replacement***

VERSION C

		Name / text	Code
X. 1	CIS		
X. 2	Cadastral code		
X. 3	Plot area		
X. 4	Plot owner		
X. 5	Farm area		
X. 6	Farm operator/respondent		

Before beginning the survey, I would like to ask you a few questions to determine if you are eligible to complete the survey.
I'd like to learn more about *this* plot of land. [Interviewer: show the respondent the cadastral code and point out the plot on a map.]

Screener1. During the 2012 agricultural season, did your farm operation operate on this plot?

Yes, my farm operation cultivated crops on this plot	1	***"You are eligible to complete the survey." Continue to Section A***
Yes, my farm operation operated this plot, even though it was uncultivated	2	***"You are eligible to complete the survey." Continue to Section A***
No, I did not have control over what happened on this plot	3	***Continue to Screener 2***
Refused	89	***Code interview result as refusal (Q4-Q6); ask field supervisor to provide two replacements: one for ISRA-CISRA and one for ACED***
Don't know	99	***Code interview result as other; ask field supervisor to provide two replacements: one for ISRA-CISRA and one for ACED***

Screener2. I'd like to ask about the crops that your farm operation cultivated during the 2012 agricultural season. Did your farm operation cultivate any of the following in a field: apples, plums, peaches, sweet cherries, almonds, walnuts, table grapes? Or did your farm operation cultivate any of the following in a greenhouse: tomatoes, cucumbers, peppers, salad greens, or culinary herbs?

Yes (at least one)	1	***"You are eligible to complete the survey." Continue; exclude section D and H from the questionnaire***
No	2	***End interview, code as 6 (ineligible) in Q4-Q6; ask field supervisor to provide two replacements: one for ISRA-CISRA and one for ACED***
Refused	89	***End interview, code as 5 (refused) in Q4-Q6; ask field supervisor to provide two replacements: one for ISRA-CISRA and one for ACED***
Don't know	99	***End interview, code as other in Q4-Q6; ask field supervisor to provide two replacements: one for ISRA-CISRA and one for ACED***

VERSION A-LARGE

		Name / text	Code
X. 1	CIS		
X. 2.A	Cadastral code		
X. 3.A	Plot area		
X. 4.A	Plot owner		
X. 2.B	Cadastral code		
X. 3.B	Plot area		
X. 4.B	Plot owner		
X. 2.C	Cadastral code		
X. 3.C	Plot area		
X. 4.C	Plot owner		
X. 5	Farm area		
X. 6	Farm operator/respondent		

VERSION B-LARGE

		Name / text	Code
X.5	Farm area		
X.6	Farm operator/respondent		

Before beginning the survey, I would like to ask you a question to determine if you are eligible to complete the survey.

Screener2. I'd like to ask about the crops that your farm operation cultivated during the 2012 agricultural season. Did your farm operation cultivate any of the following in a field: apples, plums, peaches, sweet cherries, almonds, walnuts, table grapes? Or did your farm operation cultivate any of the following in a greenhouse: tomatoes, cucumbers, peppers, salad greens, or culinary herbs?

Yes (at least one)	1	***"You are eligible to complete the survey." Continue***
No	2	***End interview, code as 6 (ineligible) in Q4-Q6***
Refused	89	***End interview, code as 5 (refused) in Q4-Q6***
Don't know	99	***End interview, code as other in Q4-Q6***

VERSION C-LARGE

		Name / text	Code
X. 1	CIS		
X. 2.A	Cadastral code		
X. 3.A	Plot area		
X. 4.A	Plot owner		
X. 2.B	Cadastral code		
X. 3.B	Plot area		
X. 4.B	Plot owner		
X. 2.C	Cadastral code		
X. 3.C	Plot area		
X. 4.C	Plot owner		
X. 5	Farm area		
X. 6	Farm operator/respondent		

A. HOUSEHOLD ROSTER

I would like to ask you some questions about all the members of your household, both present and absent. When I say "your household" I mean people who lived in your household 3 or more months out of the past year and have the same budget. I would like to ask questions about you, then your spouse, your children, and then other members of the household.

Household member roster code	Household members	**A1.** Present in the HH	**A2.** Respondent	**A3.** Household head	**A4.** Is this person male or female? 1. Male 2. Female 89. Refused 99. DK	**A5.** Age of person _ _ insert 899. Refused 999. DK	**A6.** What is (his/her) highest level of completed education? 1. No education or primary 2. Gymnasium / 8 grades 3. Lyceum, secondary general / 10 grades 4. Secondary specialized / SPT 5. Secondary vocational / Technicum 6. Higher 89. Refused 99. DK	**A7.** What was (his/her) primary residence during the 2012 agricultural season? 1. In village/on farm 2. Other Village 3. In raion center 4. Chisinau/Balti/Tiraspol/Bender 5. Out of country 89. Refused 99. DK	**A8.** What is (his/her) marital status? 1. Never married 2. Married or in an informal conjugal relationship 3. Divorced/separated (from a formal or informal conjugal relationship) 4. Widowed 89. Refused 99. DK
1	Husband	1	1	1	1				
2	Wife	2	2	2	2				
3	Child 1	3	3	3					
4	Child 2	4	4	4					
5	Child 3	5	5	5					
6	Child 4	6	6	6					
7	Child 5	7	7	7					
8	Son in law/daughter in law	8	8	8					
9	Son in law/daughter in law	9	9	9					
10	Grandchild	10	10	10					
11	Grandchild	11	11	11					
12	Grandchild	12	12	12					
13	Grandparent	13	13	13					
14	Grandparent	14	14	14					
15	Other _ _ _ _ _ _ _ _ _ _	15	15	15					
16	Other _ _ _ _ _ _ _ _ _ _	16	16	16					
17	Other _ _ _ _ _ _ _ _ _ _	17	17	17					

B. HOUSEHOLD, FARM, AND COMMUNITY CHARACTERISTICS

B 1. I'd like to learn more about the agricultural land owned and land cultivated by you and other members of your household / farm **in the period 01 November 2011 – 31 October 2012 (the season)**. Please do not include land owned or operated for non-agricultural purposes.

Instruction: For the questions related to area, ask the respondent to provide the best estimate of size. Use following codes: **-88 = Not applicable; -89 = Refused; -99 = Don't know**

	Art.12 + Art.82 - 'farming land', i.e. land outside of village/backyards			d. Greenhouses m^2	e. Garden plot (excl. greenhouses) ha, ares ***Specify the measurement unit***	f. Other (pastures, access roads, etc) ha, ares
	a. Arable land ha, ares	b. Orchards ha, ares	c. Vineyards ha, ares			
B1.1. Area of land owned?	_ _ _ _,_ _ ***If zero, skip to B1.4***	_ _ _ _,_ _ ***If zero, skip to B1.4***	_ _ _ _,_ _ ***If zero, skip to B1.4***	_ _ _ _,_ _ ***If zero, skip to B1.4***	_ _ _ _,_ _ ***unit If zero, skip to B1.4***	_ _ _ _,_ _ ***If zero, skip to B1.4***
B1.2. Of owned land, area rented out to others?	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _ ***unit***	_ _ _ _,_ _
B1.3. Of owned land, area given to use for free to others?	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _ ***unit***	_ _ _ _,_ _
B1.4. Area of land rented from others?	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _ ***unit***	_ _ _ _,_ _
B1.5. Area of land taken for free for use from others	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _ ***unit***	_ _ _ _,_ _
B1.6. Total area available for use? (B1.1–B1.2.- B1.3.+ B1.4+B1.5)	_ _ _ _,_ _ ***If zero, skip B1.7–B2.3***	_ _ _ _,_ _ ***If zero, skip B1.7–B2.3***	_ _ _ _,_ _ ***If zero, skip B1.7–B2.3***	_ _ _ _,_ _ ***If zero, skip B1.7–B2.3***	_ _ _ _,_ _ ***unit If zero, skip B1.7-B2.3***	_ _ _ _,_ _ ***If zero, skip B1.7–B2.3***
B1.7. Total area cultivated (must be less than or equal to B1.6)	_ _ _ _,_ _ ***If zero, skip B1.8–B2.3***	_ _ _ _,_ _ ***If zero, skip B1.8–B2.3***	_ _ _ _,_ _ ***If zero, skip B1.8–B2.3***	_ _ _ _,_ _ ***If zero, skip B1.8–B2.3***	_ _ _ _,_ _ ***unit If zero, skip B1.8–B2.3***	_ _ _ _,_ _ ***If zero, skip B1.8–B2.3***
B1.8. How much of cultivated land was located in a CIS command area (functional or not)? (must be less than or equal to B1.7)	_ _ _ _,_ _ ***If zero, skip B1.9***	_ _ _ _,_ _ ***If zero, skip B1.9***	_ _ _ _,_ _ ***If zero, skip B1.9***	_ _ _ _,_ _ ***If zero, skip B1.9***	_ _ _ _,_ _ ***unit If zero, skip B1.9***	_ _ _ _,_ _ ***If zero, skip B1.9***
B1.9. How much of cultivated land in a CIS command area did you irrigate during the 2012 agricultural season? (must be less than or	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _		_ _ _ _,_ _

equal to B1.8)						

B 2. ***Ask B2.1-B2.3 only to those who cultivats particular type of land – B1.7>0.*** Now I'd like to ask you about your farm in general, that is, all land that you cultivate. For each type of land, please tell me (use card BB): ***Use following codes:*** **88 = Not applicable; 89 = Refused; 99 = Don't know**

	Art.12 + Art.82 - 'farming land', i.e. land outside of village/backyards			d. Greenhouses	e. Garden plot	f. Other (pastures, access roads, etc)
	a. Arable land	b. Orchards	c. Vineyards			
*B2.1. Who in your farm decided this season what crops to cultivate where?						
*B2.2. Who in your farm decided this season how much irrigation water to use?						
*B2.3. Who in your farm decided this season when and where to sell crops cultivated?						

B 3. *B3.1. ***Show card B3***. Which of the following assets do you or anyone in your household own? ***Multiple answer***
*B3.2. Who is in charge of/controls this asset? ***Ask for each asset marked in B3.1. Use card BB.***
*B3.3. Who uses the asset most of the time? ***Ask for each asset marked in B3.1.Use card BB.***

	***B3.1**	***B3.2**				***B3.3**			
None	0	Enter code	Not applicable	Refused	Don't know	Enter code	Not applicable	Refused	Don't know
Farm buildings	1		88	89	99		88	89	99
Greenhouse	2		88	89	99		88	89	99
Farm equipment, machinery, and implements	3		88	89	99		88	89	99
Irrigation equipment	4		88	89	99		88	89	99
Refused	89								
Don't know	99								

B 4. How close is the nearest cold storage facility to your farm? ***[One answer]***

Less than 1 km	1
Between 1-5 km	2
Between 5-10 km	3
Between 10-15 km	4
More than 15 km	5
Refused	89
Don't know	99

B 5. B5.1. Did you own a cold storage facility for storing your crops during the 2012 season? ***[One answer]***
B5.2. Did you rent space in a cold storage facility to store your crops during the 2012 season? ***[One answer]***
B5.3. Did you sell your crops to an individual or enterprise who stored them in a cold storage facility during the 2012 season? ***[One answer]***

	B5.1	B5.2	B5.3
Yes	1	1	1
No	2	2	2
Refused	89	89	89
Don't know	99	99	99

If B5.1 = "Yes" (1) or B5.2 = "Yes" (1), continue. If they are BOTH no (or don't know or refused), skip to B9.

B 6. ***Ask this question if "yes" (code 1) in B5.1 or B5.2*** How many tones did you store in a cold storage facility in the 2012 season?

Tones	_ _ _ _ _ tone
Refused	89
Don't know	99

B 7. ***Ask this question if "yes" (code 1) in B5.1 or B5.2*** What was the total capacity of the cold storage facility or facilities that you used in the 2012 season?

Tones	_ _ _ _ _ tone
Refused	89
Don't know	99

B 8. ***Ask this question if "yes" (code 1) in B5.1 or B5.2*** How many farm operations, individuals, or enterprises other than you stored crops in the cold storage facility or facilities that you used in the 2012 season?

Farm operations, individuals, or enterprises	_ _ _ _ _ N
Refused	89
Don't know	99

B 9. How much irrigation water did you use on your farm during the 2012 agricultural season?

m^3	_ _ _ _ _ m^3
Refused	89
Don't know	99

B 10. *Now I want to ask you some questions regarding your current membership of various groups / organizations. ***(These questions do not refer to Water User Association)***

B10.1. Are you a member of any:	A) *Producer / agricultural organization	B) *Agricultural cooperative	C) *Saving and Credit Association
Yes, and it is functional	1	1	1
Yes, but it is not functional	2 →Skip to next column	2 →Skip to next column	2 →Skip to Section C
No	3 →Skip to next column	3 →Skip to next column	3 →Skip to Section C
Refused	89 →Skip to next column	89 →Skip to next column	89 →Skip to Section C
Don't know	99 →Skip to next	99 →Skip to next column	99 →Skip to Section C

	column		
B10.2. Do you have a leadership position in this group?			
Yes	1	1	1
No	2	2	2
Refused	89	89	89
Don't know	99	99	99
B10.3. How much input do you have in making decisions in this group?			
No input	1	1	1
Input into some decisions	2	2	2
Input into most decisions	3	3	3
Input into all decisions	4	4	4
Refused	89	89	89
Don't know	99	99	99

C. FARM PRODUCTION, REVENUE, AND COSTS

Now I'd like to ask you some questions about crop production and revenue in field plots and greenhouses during the 2012 agricultural season. Please include all crops cultivated by your farm, except those solely for personal consumption. When answering these questions, please tell me about the 2012 agricultural season (**01 November 2011 – 31 October 2012)** only.

C 1. In the 2012 agricultural season, please tell me, which crops did your farm cultivate? ***Show crop card***
C 2. For each cultivated crop, please tell me who was primarily responsible for the crop. ***[ask for each crop marked in C1. use BB card]***
C 3. For each cultivated crop, on how much land did you cultivate this crop in (1) a field in a CIS command area, (2) a field outside a CIS command area, (3) a greenhouse in a CIS command area, and (4) a greenhouse outside a CIS command area? ***[ask for each crop marked in C1]***
C 4. For each cultivated crop, how much was irrigated/watered? ***[ask for each crop marked in C1]***
C 5. ***If crop is grown in an orchard or vineyard,*** Approximately how many tree/vines did you cultivate? ***[ask for each crop marked in C1 that is grown in an orchard or vineyard.]***
C 6. For each cultivated crop, please tell me the volume harvested in tones. ***[ask for each crop marked in C1; if 0, skip to next crop]***
C 7. For each cultivated crop, please tell me the volume sold (1) in tones and (2) in thousands of Lei. ***[ask for each crop marked in C1]***
C 8. Which months did you sell the crop? ***[ask for each crop >0 in C7; multiple answers***]
C 9. Did you sell this crop on the local market or did you export it? ***[ask for each crop >0 in C7; mark all that apply]***
Use following codes: **-89 = Refused; -99 = Don't know**

Crop	C1. Cultivated crops	C2. HH member responsible	C3. Area				C4. Area irrigated, ha	C5. Number of trees/vines	C6. Harvested – tones	C7. Sold		C8. Months: 1..12	C9. Destination of products			
			Field In CIS, ha	Field Outside CIS, ha	Greenhouse in CIS, m^2	Greenhouse Outside CIS, m^2				Tones	Lei (thousands)		Local Market	Export	Refused	Don't know
Wheat	1											__, __, __, __	1	2	89	99
Rye	2											__, __, __, __	1	2	89	99
Barley	3											__, __, __, __	1	2	89	99
Oats	4											__, __, __, __	1	2	89	99
Corn	5											__, __, __, __	1	2	89	99
Pea	6											__, __, __, __	1	2	89	99
Bean	7											__, __, __, __	1	2	89	99

Crop	C1. Cultivated crops	C2. HH member responsible	C3. Area				C4. Area irrigated, ha	C5. Number of trees/vines	C6. Harvested – tones	C7. Sold		C8. Months: 1..12	C9. Destination of products			
			Field In CIS, ha	Field Outside CIS, ha	Greenhouse in CIS, m^2	Greenhouse Outside CIS, m^2				Tones	Lei (thousands)		Local Market	Export	Refused	Don't know
Tobacco	8											__, __, __ , __	1	2	89	99
Sunflower	9											__, __, __ , __	1	2	89	99
Rape	10											__, __, __ , __	1	2	89	99
Soybean	11											__, __, __ , __	1	2	89	99
Medical plants, herbs and spices	12											__, __, __ , __	1	2	89	99
Sugar beet	13											__, __, __ , __	1	2	89	99
Potatoes	14											__, __, __ , __	1	2	89	99
Cabbage	15											__, __, __ , __	1	2	89	99
Tomatoes	16											__, __, __ , __	1	2	89	99
Pepper	17											__, __, __ , __	1	2	89	99
Onion	18											__, __, __ , __	1	2	89	99
Cucumbers	19											__, __, __ , __	1	2	89	99
Carrot	20											__, __, __ , __	1	2	89	99
Sal. greens	21											__, __, __ , __	1	2	89	99
Cul. herbs	22											__, __, __ , __	1	2	89	99
Oth. veg.	23											__, __, __ , __	1	2	89	99
W.melons	24											__, __, __ , __	1	2	89	99
Fodder plants	25											__, __, __ , __	1	2	89	99
Seeds	26											__, __, __ , __	1	2	89	99
Seedlings (item)	27											__, __, __ , __	1	2	89	99
Flowers and ornament. plants (item)	28											__, __, __ , __	1	2	89	99
Other arable crops	29											__, __, __ , __	1	2	89	99

Crop	C1. Cultivated crops	C2. HH member responsible	C3. Area				C4. Area irrigated, ha	C5. Number of trees/vines	C6. Harvested – tones	C7. Sold		C8. Months: 1..12	C9. Destination of products			
			Field In CIS, ha	Field Outside CIS, ha	Greenhouse in CIS, m^2	Greenhouse Outside CIS, m^2				Tones	Lei (thousands)		Local Market	Export	Refused	Don't know
Natural pastures and hayfields	30											__, __, __ , __	1	2	89	99
Apples	31											__, __, __ , __	1	2	89	99
Pears	32											__, __, __ , __	1	2	89	99
Cherry	33											__, __, __ , __	1	2	89	99
Sweet cherry	34											__, __, __ , __	1	2	89	99
Plums	35											__, __, __ , __	1	2	89	99
Peaches	36											__, __, __ , __	1	2	89	99
Nectarines	37											__, __, __ , __	1	2	89	99
Apricot	38											__, __, __ , __	1	2	89	99
Other fruit from trees	39											__, __, __ , __	1	2	89	99
Walnuts	40											__, __, __ , __	1	2	89	99
Almonds	41											__, __, __ , __	1	2	89	99
Str.berries	42											__, __, __ , __	1	2	89	99
Shrubs (item)	43											__, __, __ , __	1	2	89	99
Table grape	44											__, __, __ , __	1	2	89	99
Wine	45											__, __, __ , __	1	2	89	99
Other plants grown in a nursery	46											__, __, __ , __	1	2	89	99
Other perennial	47											__, __, __ , __	1	2	89	99

C 10. Where did you sell the crop? ***[ask for each crop >0 in C7, mark all that apply]***
C 11. To whom did you sell the crop? ***[ask for each crop >0 in C7, mark all that apply]***
C 12. Volume of the harvest left to be sold***? [ask for each crop >0 in C6]***
C 13. Volume of the harvest paid to hired labor or bartered? ***[ask for each crop >0 in C6]***
C 14. Volume of the harvest damaged / destroyed***? [ask for each crop >0 in C6]***
C 15. Did you store any of your 2012 harvest of this crop in a cold storage facility? ***[ask for each crop >0 in C6]***
Use following codes: **-89 = Refused; -99 = Don't know**

Crop	C1. Cultivated crops	C10. Point of Sale							C11. Buyer of the product									C12. To be sold – tones	C13. Paid to labor / bartered	C14. Damaged / destroyed	C15. Cold storage			
		Farm gate/road side	Local market (informal)	Local market (formal)	Regional market	Other than local/regional market	Refused	Don't know	End consumer (direct)	Trader/intermediary	Cooperative (Marketing)	Packing center	Processor	Retailer	Other	Refused	Don't know				Yes	No	Refused	Don't know
Wheat	1	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Rye	2	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Barley	3	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Oats	4	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Corn	5	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Pea	6	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Bean	7	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Tobacco	8	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Sunflower	9	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Rape	10	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Soybean	11	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Medical plants, herbs and spices	12	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Sugar beet	13	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Potatoes	14	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Cabbage	15	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Tomatoes	16	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Pepper	17	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99

Crop	C1. Cultivated crops	C10. Point of Sale							C11. Buyer of the product									C12. To be sold – tones	C13. Paid to labor / bartered	C14. Damaged / destroyed	C15. Cold storage			
		Farm gate/road side	Local market (informal)	Local market (formal)	Regional market	Other than local/regional market	Refused	Don't know	End consumer (direct)	Trader/intermediary	Cooperative (Marketing)	Packing center	Processor	Retailer	Other	Refused	Don't know				Yes	No	Refused	Don't know
Onion	18	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Cucumbers	19	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Carrot	20	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Sal. greens	21	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Cul. herbs	22	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Oth. veg.	23	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
W.melons	24	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Fodder plants	25	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Seeds	26	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Seedlings (item)	27	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Flowers and ornament. plants (item)	28	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Other arable crops	29	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Natural pastures and hayfields	30	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Apples	31	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Pears	32	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Cherry	33	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Sweet cherry	34	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Plums	35	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Peaches	36	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Nectarines	37	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Apricot	38	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Other fruit from trees	39	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Walnuts	40	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Almonds	41	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Str.berries	42	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Shrubs (item)	43	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99

Crop	C1. Cultivated crops	C10. Point of Sale							C11. Buyer of the product									C12. To be sold – tones	C13. Paid to labor / bartered	C14. Damaged / destroyed	C15. Cold storage			
		Farm gate/road side	Local market (informal)	Local market (formal)	Regional market	Other than local/regional market	Refused	Don't know	End consumer (direct)	Trader/intermediary	Cooperative (Marketing)	Packing center	Processor	Retailer	Other	Refused	Don't know				Yes	No	Refused	Don't know
Table grape	44	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Wine	45	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Other plants grown in a nursery	46	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Other perennial		1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99

C 16. ***Show Card C16*** During the 2012 agricultural season, how much (in total, in MDL) did you (your farm) spend on the following? ***[If you don't pay money for any of the listed items but do obtain them or use your own, evaluate the value in Lei]***.

	Lei
1. Seeds / seedlings	
2. Organic fertilizers	
3. Mineral fertilizers	
4. Herbicides, fungicides, insecticides, other chemicals	
5. Hired labor	
6. Equipment rentals/tools (including spare parts & fuel)	
7. Bringing to market (including packaging, transportation, marketing, etc.)	
8. Irrigation water	
9. Equipment for drip irrigation	
10. Equipment for sprinklers	
11. Other irrigation costs	
12. Greenhouses	
13. Cold storage construction and maintenance	
14. Cold storage rental payments	
15. Other storage for farm production	
16. Other physical/infrastructure improvements for farm	
17. Repayments of loan principal and interest for agricultural loans	
18. Other taxes related to agricultural production or sales	
19. Rental payments to landowners for agricultural land	
20. Agricultural land purchases	
21. Agricultural land taxes	
22. Agricultural equipment purchase	
Other major farming expenditures (specify) _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _	

D. FOCAL PLOT – QUESTIONNAIRES A, A-Large, C, and C-Large ONLY

[Interviewer: show the respondent the cadastral code and point out the plot on a map. Write the cadastral code here: _____]

D 1. My records show that this plot is [_____ENTER SIZE FROM COVER SHEET] hectares. Is that correct?

Yes	1	***Skip to D3***
No	2	***Continue***
Refused	89	***Skip to D3***
Don't know	99	

D 2. How large is **this plot**? ***Enter Ha***

HA	_ _ _ _ _ Ha
Refused	89
Don't know	99

D 3. During the 2012 agricultural season, how much area of this plot did you cultivate? ***Enter Ha***

HA	_ _ _ _ _ Ha
Refused	89
Don't know	99

D 4. In the 2012 agricultural season, did you own **this plot**? ***[Mark one]***

Yes	1	***Skip to D6***
No, I/we rented it	2	***Continue***
No, but I/we did not pay to use it	3	***Skip to D6***
Refused	89	
Don't know	99	

D 5. In the 2012 agricultural season, how much (total) have you paid for the use of **this plot**? ***[Insert Lei]***

Lei	
Refused	89
Don't know	99

D 6. Now I'd like to ask you some questions about farming on this plot during the 2012 agricultural season:
D6.1. In the 2012 agricultural season, which crops did your farm operation cultivate on **this plot**? If you cultivated a crop but did not have a harvest, please still provide the crop code. ***[Enter codes from Section C; multiple responses allowed]***
D6.2. For each crop listed in D6.1, of the total volume (tons) of that crop's harvest from all plots during the 2012 agricultural season, what percentage was harvested **from this plot**? ***If no harvest of this crop from this plot, enter 0, 889 = Refused; 999 = Don't know***

D6.1. Crops cultivated on focal plot			D6.2. Percentage of crop's total harvest (tonnage) that was harvested from **this plot** (2012 agricultural season)
No crops cultivated	00	***Skip to D13***	
Crop 1 ***Enter code***		***Continue***	_ _ _ %
Crop 2 ***Enter code***			_ _ _ %
Crop 3 ***Enter code***			_ _ _ %
Crop 4 ***Enter code***			_ _ _ %
Crop 5 ***Enter code***			_ _ _ %
Crop 6 ***Enter code***			_ _ _ %
Crop 7 ***Enter code***			_ _ _ %
Crop 8 ***Enter code***			_ _ _ %
Crop 9 ***Enter code***			_ _ _ %
Crop 10 ***Enter code***			_ _ _ %
Refused	89		
Don't know	99		

D 7. In the 2012 agricultural season, what irrigation source was used for **this plot**? ***[Mark all that apply]***

Was not irrigated	0	***Skip to D9***
CIS/Apele Moldovei	1	***Continue***
CIS/WUA	2	
Private provider	3	
Other piped system	4	
Refused	89	
Don't know	99	

D 8.

		Refused	Don't know
D8.1. Over the 2012 agricultural season, how many cubic meters of water did you use to irrigate **this plot**? ***[Enter m^3]***	_ _ _ _ m^3	89	99
D8.2. During the 2012 agricultural season, how much did you pay, on average, per cubic meter of irrigation water for **this plot**? ***[Enter Lei per m^3]***	_ _ _ _ _ Lei/m^3	89	99

D 9.

		Refused	Don't know
D9.1. In the 2012 agricultural season, how many hired laborers worked on **this plot**? ***[Enter number of persons]***	_ _ _ _ persons ***If zero, skip to D10***	89	99
D9.2. Please estimate the total amount those laborers were paid for work on **this plot** during the 2012 agricultural season. If the laborers worked on more than one plot, please estimate how much of their wages can be attributed to work on **this plot**. ***[Enter amount in Lei including value of any in-kind payments]***	_ _ _ _ _ Lei	89	99

D 10. If this plot includes an orchard or vineyard, how long ago were the trees or vines planted, on average? ***[enter average number of years]***

No orchard/vineyard	00	Skip to D12
Number of years	_ _ _ _ _ _ years	Continue
Refused	89	Skip to D12
Don't know	99	

D 11. If this plot includes an orchard or vineyard, approximately how many trees/vines are planted on the plot? ***[enter number of trees/vines]***

Number of trees	_ _ _ _ _ _ trees
Number of vines	_ _ _ _ _ _ vines
Refused	89
Don't know	99

D 12. Is there a greenhouse on **this plot**?

Yes	1	***Skip to E1***
No	2	
Refused	89	
Don't know	99	

D 13. Why wasn't **this plot** cultivated during the 2012 agricultural season? ***[Mark all that apply]***

Not yet productive	0
Fallow	1
Flooded	2
Rough-stalk meadow	3
No available labor	4
No working capital	5
Other	6
Refused	89
Don't know	99

E. CROP AND POST HARVESTING PRACTICES/EQUIPMENT

Interviewer:

-Ask about apple practices only if the farm operator cultivates apples, check C1

-Ask about stone fruit (peach/plum/sweet cherry) practices only if the farm operator cultivates peaches, plums, or sweet cherries, check C1

-Ask about table grape practices only if the farm operator cultivates table grapes, check C1

-Ask about vegetable practices only if the farm operator cultivates vegetables – tomatoes, cucumbers, sweet paper, salad greens, culinary herbs, check C1

Now I'd like to ask about practices or equipment that you or others may have used in producing crops on your farm.

E 1. ***Show card E1*** Do you or others who work on your farm know about this practice or equipment?

E 2. During the past agricultural season (2012), did you or others apply/utilize this practice or equipment on your farm? ***[Ask for each practice/equipment marked "Yes" in E1; if the practice is not used, skip to E4]***

E 3. During the past agricultural season (2012), on how many hectares on your farm did you or others apply/utilize this practice or equipment? If you are not sure, please estimate. ***[Ask for each practice/equipment marked "Yes" in E2, enter hectares, rounded to the nearest tenth of a hectare]***

E 4. Why did you or others not use this practice or equipment during the past agricultural season (2012)? ***[Mark all that apply; ask for those practices marked "Yes" in D1, but "No," "Don't know," or "Refused" in E2.]***

E 5. During the previous agricultural season (2011), did you or others apply/utilize this practice or equipment on your farm? ***[Ask for each practice/equipment marked "Yes" in E1]***

E 6. From whom or what did you or others who work on your farm learn about this practice or equipment? ***[Ask for each practice/equipment marked "Yes" in E1, one answer]***

	E1. Knowledge of practice/equip.				E2. Use of practice/equipment				E3. Hectares			E4. Reasons for not using								E5. Use of practice/equipment during last season			
	Yes	No	Refused	Don't know	Yes	No	Refused	Don't know	Enter HA	Refused	Don't know	Costly	Doesn't seem useful	Too complicated	Takes too much time	Used in previous season (if practice is not yearly)	Other	Refused	Don't know	Yes	No	Refused	Don't know
1. Apple	⇒	Skip to next practice			⇒	Skip to E4			Go to E5 after E3			⇒								⇒			
1. implementing intensive orchard systems	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
2. weather stations	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
3. drip irrigation	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
4. water testing	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
5. fertigation	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
6. anti-hail net	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99

7. frost management	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
8. integrated disease and pest management	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
9. fruit thinning to increase size of apples	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
10. picking bags	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
11. harvesting platforms	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
12. wood containers for harvest	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
13. plastic containers for harvest	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
14. color charts	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
15. penetrometers	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
16. cold storage ***(if not using, skip to 20)***	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
17. humidity or temperature control in storage areas	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
18. putting crates or boxes on pallets or using corner boards	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
19. ethylene management (SmartFresh)	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
20. grading and sorting equipment	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
21. humidity or temperature control in packing areas	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
22. modified atmosphere/modified humidity packaging	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
23. tray liners	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
24. open trays	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99

25. punnets	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
26. returnable plastic crates	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
27. pre-cooling	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
2. Table grapes																							
1. cluster thinning	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
2. bark girdling to increase grape size	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
3. growth stimulators	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
4. introducing new varieties	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
5. weather stations	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
6. drip irrigation	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
7. water testing; in other words, testing pH and/ or salt concentration in water used for irrigation	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
8. fertigation (using of fertilizers dissolved in water in drip irrigation)	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
9. anti-hail net	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
10. frost management	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
11. integrated disease and pest management	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
12. harvesting platforms	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
13. putting crates or boxes on pallets or using corner boards for harvesting	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
14. cold storage (if not using, skip to 19)	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99

15. humidity or temperature control in storage areas	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
16. inner packaging/storage (sulfur pads)	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
17. room cooling (forced-air)	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
18. pre-cooling	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
19. putting crates or boxes on pallets or using corner boards for packing	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
20. modified atmosphere/modified humidity packaging	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
21. water-absorbent pads	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
22. open trays	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
23. punnets	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
24. returnable plastic crates	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
3. Tomatoes, cucumbers, sweet paper, salad greens, culinary herbs																								
1. seedling production (if not, skip to 12)	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
2. integrated disease and pest management for seedling production	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
3. micro climate control systems in greenhouses (ventilation, use of double layer film, heating) for seedling production	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
4. introducing new varieties/hybrids for seedling production	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
5. pallets for seedling production trays	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99

6. peat for seedling production	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
7. drip irrigation for seedling production	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
8. water testing for seedling production; in other words, testing pH and/ or salt concentration in water used for irrigation	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
9. fertigation (using of fertilizers dissolved in water in drip irrigation) for seedling production	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
10. supplementary illumination for seedling production	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
11. energy saving techniques and equipment for seedling production such as double tunnels and biomass heating generators	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
12. bumblebees or other techniques to increase tomato pollination in greenhouses (tomatoes only)	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
13. micro climate control systems in greenhouses (ventilation, use of double layer film, heating) for vegetable production	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
14. introducing new varieties/hybrids for vegetable production	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
15. mulching for vegetable production	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
16. drip irrigation for vegetable production	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
17. water testing for vegetable production; in other words, testing pH and/ or salt	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99

concentration in water used for irrigation																								
18. fertigation for vegetable production (using of fertilizers dissolved in water in drip irrigation)	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
19. energy saving techniques and equipment for vegetable production such as double layer or biomass heating generators	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
20. growth stimulators for vegetable production	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
21. support systems for vegetable production	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
22. harvesting platform	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
23. plastic boxes	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
24. putting crates or boxes on pallets or using corner boards	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
25. tray liners	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
26. water-absorbent pads	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
27. open trays	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
28. punnets	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
29. returnable plastic crates	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
4. Stone fruits - peaches, plums, or sweet cherries																								
1. intensive orchard systems; in other words, using new rootstocks, new cultivars, or tree support systems	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99

2. weather stations	1	2	89	99	1	2	89	99	----’--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
3. drip irrigation	1	2	89	99	1	2	89	99	----’--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
4. water testing; in other words, testing pH and/ or salt concentration in water used for irrigation	1	2	89	99	1	2	89	99	----’--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
5. fertigation (using of fertilizers dissolved in water in drip irrigation)	1	2	89	99	1	2	89	99	----’--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
6. anti-hail net	1	2	89	99	1	2	89	99	----’--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
7. anti-rain nets	1	2	89	99	1	2	89	99	----’--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
8. frost management	1	2	89	99	1	2	89	99	----’--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
9. manual thinning	1	2	89	99	1	2	89	99	----’--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
10. summer pruning	1	2	89	99	1	2	89	99	----’--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
11. winter pruning	1	2	89	99	1	2	89	99	----’--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
12. testing bud fertility	1	2	89	99	1	2	89	99	----’--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
13. canopy training	1	2	89	99	1	2	89	99	----’--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
14. horizontal lining of bearing branches	1	2	89	99	1	2	89	99	----’--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
15. picking bags	1	2	89	99	1	2	89	99	----’--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
16. cold storage (if not using, skip to 21)	1	2	89	99	1	2	89	99	----’--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
17. humidity or temperature control in storage areas	1	2	89	99	1	2	89	99	----’--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
18. putting crates or boxes on pallets or using corner boards	1	2	89	99	1	2	89	99	----’--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
19. ethylene management (SmartFresh)	1	2	89	99	1	2	89	99	----’--	89	99	1	2	3	4	5	6	89	99	1	2	89	99

20. implementing controlled atmosphere in storage	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
21. temperature or humidity control in packing areas	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
22. modified atmosphere/modified humidity packaging	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
23. tray liners	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
24. open trays	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
25. punnets	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
26. pre-cooling	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99

	E6. Information source									
	Family member	Education	Training session	Expert consultant	Neighbor or other farmer	Media	Technical bulletin by mail	Other	Refused	Don't know
1. Apple										
1. implementing intensive orchard systems	1	2	3	4	5	6	7	8	89	99

2. weather stations	1	2	3	4	5	6	7	8	89	99
3. drip irrigation	1	2	3	4	5	6	7	8	89	99
4. water testing	1	2	3	4	5	6	7	8	89	99
5. fertigation	1	2	3	4	5	6	7	8	89	99
6. anti-hail net	1	2	3	4	5	6	7	8	89	99
7. frost management	1	2	3	4	5	6	7	8	89	99
8. integrated disease and pest management	1	2	3	4	5	6	7	8	89	99
9. fruit thinning to increase size of apples	1	2	3	4	5	6	7	8	89	99
10. picking bags	1	2	3	4	5	6	7	8	89	99
11. harvesting platforms	1	2	3	4	5	6	7	8	89	99
12. wood containers for harvest	1	2	3	4	5	6	7	8	89	99
13. plastic containers for harvest	1	2	3	4	5	6	7	8	89	99
14. color charts	1	2	3	4	5	6	7	8	89	99
15. penetrometers	1	2	3	4	5	6	7	8	89	99
16. cold storage ***(if not using, skip to 20)***	1	2	3	4	5	6	7	8	89	99
17. humidity or temperature control in storage areas	1	2	3	4	5	6	7	8	89	99
18. putting crates or boxes on pallets or using corner boards	1	2	3	4	5	6	7	8	89	99
19. ethylene management (SmartFresh)	1	2	3	4	5	6	7	8	89	99
20. grading and sorting equipment	1	2	3	4	5	6	7	8	89	99
21. humidity or temperature control in packing areas	1	2	3	4	5	6	7	8	89	99

22. modified atmosphere/modified humidity packaging	1	2	3	4	5	6	7	8	89	99
23. tray liners	1	2	3	4	5	6	7	8	89	99
24. open trays	1	2	3	4	5	6	7	8	89	99
25. punnets	1	2	3	4	5	6	7	8	89	99
26. returnable plastic crates	1	2	3	4	5	6	7	8	89	99
27. pre-cooling	1	2	3	4	5	6	7	8	89	99
2. Table grapes										
1. cluster thinning	1	2	3	4	5	6	7	8	89	99
2. bark girdling to increase grape size	1	2	3	4	5	6	7	8	89	99
3. growth stimulators	1	2	3	4	5	6	7	8	89	99
4. introducing new varieties	1	2	3	4	5	6	7	8	89	99
5. weather stations	1	2	3	4	5	6	7	8	89	99
6. drip irrigation	1	2	3	4	5	6	7	8	89	99
7. water testing; in other words, testing pH and/ or salt concentration in water used for irrigation	1	2	3	4	5	6	7	8	89	99
8. fertigation (using of fertilizers dissolved in water in drip irrigation)	1	2	3	4	5	6	7	8	89	99
9. anti-hail net	1	2	3	4	5	6	7	8	89	99
10. frost management	1	2	3	4	5	6	7	8	89	99
11. integrated disease and pest management	1	2	3	4	5	6	7	8	89	99
12. harvesting platforms	1	2	3	4	5	6	7	8	89	99

13. putting crates or boxes on pallets or using corner boards for harvesting	1	2	3	4	5	6	7	8	89	99
14. cold storage (if not using, skip to 19)	1	2	3	4	5	6	7	8	89	99
15. humidity or temperature control in storage areas	1	2	3	4	5	6	7	8	89	99
16. inner packaging/storage (sulfur pads)	1	2	3	4	5	6	7	8	89	99
17. room cooling (forced-air)	1	2	3	4	5	6	7	8	89	99
18. pre-cooling	1	2	3	4	5	6	7	8	89	99
19. putting crates or boxes on pallets or using corner boards for packing	1	2	3	4	5	6	7	8	89	99
20. modified atmosphere/modified humidity packaging	1	2	3	4	5	6	7	8	89	99
21. water-absorbent pads	1	2	3	4	5	6	7	8	89	99
22. open trays	1	2	3	4	5	6	7	8	89	99
23. punnets	1	2	3	4	5	6	7	8	89	99
24. returnable plastic crates	1	2	3	4	5	6	7	8	89	99
3. Tomatoes, cucumbers, sweet paper, salad greens, culinary herbs										
1. seedling production (if not, skip to 12)	1	2	3	4	5	6	7	8	89	99
2. integrated disease and pest management for seedling production	1	2	3	4	5	6	7	8	89	99
3. micro climate control systems in greenhouses (ventilation, use of double layer film, heating) for seedling production	1	2	3	4	5	6	7	8	89	99
4. introducing new varieties/hybrids for seedling production	1	2	3	4	5	6	7	8	89	99

5. pallets for seedling production trays	1	2	3	4	5	6	7	8	89	99
6. peat for seedling production	1	2	3	4	5	6	7	8	89	99
7. drip irrigation for seedling production	1	2	3	4	5	6	7	8	89	99
8. water testing for seedling production; in other words, testing pH and/ or salt concentration in water used for irrigation	1	2	3	4	5	6	7	8	89	99
9. fertigation (using of fertilizers dissolved in water in drip irrigation) for seedling production	1	2	3	4	5	6	7	8	89	99
10. supplementary illumination for seedling production	1	2	3	4	5	6	7	8	89	99
11. energy saving techniques and equipment for seedling production such as double tunnels and biomass heating generators	1	2	3	4	5	6	7	8	89	99
12. bumblebees or other techniques to increase tomato pollination in greenhouses (tomatoes only)	1	2	3	4	5	6	7	8	89	99
13. micro climate control systems in greenhouses (ventilation, use of double layer film, heating) for vegetable production	1	2	3	4	5	6	7	8	89	99
14. introducing new varieties/hybrids for vegetable production	1	2	3	4	5	6	7	8	89	99
15. mulching for vegetable production	1	2	3	4	5	6	7	8	89	99
16. drip irrigation for vegetable production	1	2	3	4	5	6	7	8	89	99
17. water testing for vegetable production; in other words, testing pH and/ or salt concentration in water used for irrigation	1	2	3	4	5	6	7	8	89	99
18. fertigation for vegetable production (using of fertilizers dissolved in water in drip irrigation)	1	2	3	4	5	6	7	8	89	99

19. energy saving techniques and equipment for vegetable production such as double layer or biomass heating generators	1	2	3	4	5	6	7	8	89	99
20. growth stimulators for vegetable production	1	2	3	4	5	6	7	8	89	99
21. support systems for vegetable production	1	2	3	4	5	6	7	8	89	99
22. harvesting platform	1	2	3	4	5	6	7	8	89	99
23. plastic boxes	1	2	3	4	5	6	7	8	89	99
24. putting crates or boxes on pallets or using corner boards	1	2	3	4	5	6	7	8	89	99
25. tray liners	1	2	3	4	5	6	7	8	89	99
26. water-absorbent pads	1	2	3	4	5	6	7	8	89	99
27. open trays	1	2	3	4	5	6	7	8	89	99
28. punnets	1	2	3	4	5	6	7	8	89	99
29. returnable plastic crates	1	2	3	4	5	6	7	8	89	99
4. Stone fruits - peaches, plums, or sweet cherries										
1. intensive orchard systems; in other words, using new rootstocks, new cultivars, or tree support systems	1	2	3	4	5	6	7	8	89	99
2. weather stations	1	2	3	4	5	6	7	8	89	99
3. drip irrigation	1	2	3	4	5	6	7	8	89	99
4. water testing; in other words, testing pH and/ or salt concentration in water used for irrigation	1	2	3	4	5	6	7	8	89	99
5. fertigation (using of fertilizers dissolved in water in drip irrigation)	1	2	3	4	5	6	7	8	89	99

6. anti-hail net	1	2	3	4	5	6	7	8	89	99
7. anti-rain nets	1	2	3	4	5	6	7	8	89	99
8. frost management	1	2	3	4	5	6	7	8	89	99
9. manual thinning	1	2	3	4	5	6	7	8	89	99
10. summer pruning	1	2	3	4	5	6	7	8	89	99
11. winter pruning	1	2	3	4	5	6	7	8	89	99
12. testing bud fertility	1	2	3	4	5	6	7	8	89	99
13. canopy training	1	2	3	4	5	6	7	8	89	99
14. horizontal lining of bearing branches	1	2	3	4	5	6	7	8	89	99
15. picking bags	1	2	3	4	5	6	7	8	89	99
16. cold storage (if not using, skip to 21)	1	2	3	4	5	6	7	8	89	99
17. humidity or temperature control in storage areas	1	2	3	4	5	6	7	8	89	99
18. putting crates or boxes on pallets or using corner boards	1	2	3	4	5	6	7	8	89	99
19. ethylene management (SmartFresh)	1	2	3	4	5	6	7	8	89	99
20. implementing controlled atmosphere in storage	1	2	3	4	5	6	7	8	89	99
21. temperature or humidity control in packing areas	1	2	3	4	5	6	7	8	89	99
22. modified atmosphere/modified humidity packaging	1	2	3	4	5	6	7	8	89	99
23. tray liners	1	2	3	4	5	6	7	8	89	99
24. open trays	1	2	3	4	5	6	7	8	89	99
25. punnets	1	2	3	4	5	6	7	8	89	99

26. pre-cooling	1	2	3	4	5	6	7	8	89	99

E 7. ***Ask this question if the respondent mentioned "Expert consultant" and / or "Neighbor or other farmer," codes 4, 5 in E6.***
You mentioned that you have learned about practices or equipment from a consultation. Please tell me the name of this person and the name of the community and raion where he/she is from (if known)? If you learned about practices or equipment from more than one person, please give the name, community, and raion of the person from whom you learned the most.

		Refused	Don't Know
Name	_ _ _ _ _ _ _	89	99
Community (or Village)	_ _ _ _ _ _ _	89	99
Raion	_ _ _ _ _ _ _	89	99

F. AGRICULTURAL TRAININGS

F 1. Have you heard of agricultural trainings being conducted in your area in the previous 12 months?

Yes	1
No	2
Refused	89
Don't know	99

F 2. Who from your household, including you, participated in agricultural training during the previous 12 months? ***[enter roster codes of HH members from section A; enter 00 if none]***

HH member roster codes from section A		***If none of the HH members attended training, continue; if the respondent roster code is given – skip to F6; If the respondent code is not given, but any of the HH members attended training – skip to F4***
Refused	89	
Don't know	99	

F 3. Why didn't you attend training? ***[multiple answers allowed]***

Trainings were too far away	1	***Skip to section G***
Trainings were too expensive	2	
I did not hear about trainings of interest to me	3	
Trainings were too time-consuming	4	
Training topics were too advanced for me	5	
Training topics were too simple for me	6	
Trainings were focused on crops that are not of interest to me	7	
Had pressing work/business to attend to	8	
Had pressing social obligation	9	
Refused	89	
Don't know	99	

F 4. ***If in F2 respondent did not identify his / her roster code:*** My understanding is that you did not attend any agricultural trainings during the previous 12 months. Is that correct?

Yes	1	***Continue***
No	2	***return to F2 and ask respondent to confirm roster codes***
Refused	89	
Don't know	99	

F 5. ***If F2 indicates that more than one person attended training:*** Which member attended the most recent training?

Enter roster code	__	***Write person's name in the "training attendee" box on the last page;***
Refused	89	***Skip to section G***
Don't know	99	

If F2 indicates that just one person attended training, write that person's name in the "training attendee" box on the last page.

Continue to F6 with the training attendee. If the training attendee is not available to answer questions, please skip to section G.

If F2 indicates that just one person attended training, write that person's name in the "training attendee" box on the last page.

Continue to F6 with the training attendee. If the training attendee is not available to answer questions, please skip to section G.

F 6.

Training 1: I'd like to ask you some questions about the three most recent trainings that you attended: First, please tell me about the most recent training that you attended… (ask F6.1-F6.12 using "Training 1" column).

Training 2: Did you attend any other trainings in the previous 12 months? If so, please tell me about the next most recent training that you attended… (ask F6.1-F6.12 using "Training 2" column).

Training 3: Did you attend any other trainings in the previous 12 months? If so, please tell me about the next most recent training that you attended… (ask F6.1-F6.12 using "Training 3" column).

	Training 1	Training 2	Training 3
F6.1. When did the training occur? ***[Interviewer: if the date is not in the previous 12 months, ask respondent if he/she attended a more recent training. If not, skip to Section G.]***			
Enter month and year	_ _ / _ _ _ _ MM/YEAR	_ _ / _ _ _ _ MM/YEAR	_ _ / _ _ _ _ MM/YEAR
Refused	89	89	89
Don't know	99	99	99
F6.2. What was the focus of this training? ***[multiple answers allowed]***			
New varieties	1	1	1
Crop profitability	2	2	2
New agricultural practices and modern technologies	3	3	3
Greenhouse building and design	4	4	4
Harvest and post-harvest practices	5	5	5
Production of seedlings	6	6	6
Use of irrigation	7	7	7
Market access	8	8	8
Use of chemicals and fertilizers	9	9	9
Cost analysis	10	10	10
Other (specify)	_ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _
Other (specify)	_ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _
Other (specify	_ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _
Refused	89	89	89
Don't know	99	99	99
F6.3. At any time prior to 2012, had you ever attended a similar training?			
Yes	1	1	1
No	2	2	2
Refused	89	89	89
Don't know	99	99	99

F6.4. On what crop or crops did this training focus? ***[multiple codes allowed; enter crop codes from Section C If the training did not focus on a particular crop, enter 0."]***			
Crop codes	_ _ _ _ _	_ _ _ _ _	_ _ _ _ _
Refused	89	89	89
Don't know	99	99	99
F6.5. Was this training provided by the ACED project, which is sponsored by USAID, MCA-Moldova, and MCC?			
Yes	1 - Skip to F6.7	1 - Skip to F6.7	1 - Skip to F6.7
No	2	2	2
Refused	89	89	89
Don't know	99	99	99
F6.6. Who provided the training? ***[multiple answers allowed]***			
Private provider	1	1	1
MAFI, Raion Department for Agriculture and Food	2	2	2
Extension Service provider (ACSA network)	3	3	3
International TA project	4	4	4
Other (specify)	_ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _
Other (specify)	_ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _
Other (specify)	_ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _
Refused	89	89	89
Don't know	99	99	99
F6.7. How many other members of your household participated in this training (with you)? ***[Do not include yourself in the count]***			
Insert number	_ _ _	_ _ _	_ _ _
Refused	89	89	89
Don't know	99	99	99
F6.8 Did you share information about practices learned in this training with anyone outside your household who did not attend training? ***[one answer]***			
No practices learned	0	0	0
Yes, in great detail	1	1	1
Yes, in some detail	2	2	2
Yes, very briefly / in passing	3	3	3
No, never spoke about it with another	4	4	4
Refused	89	89	89
Don't know	99	99	99
F6.9. In total, how many hours did you spend in the training? ***[Enter number of hours]***			
Hours	_ _ (HH)	_ _ (HH)	_ _ (HH)
Refused	89	89	89
Don't know	99	99	99
F6.10 In what city/village and raion was the training conducted?			
City / village:	_ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _
Raion:	_ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _
Refused	89	89	89
Don't know	99	99	99

F6.11. How long did it take you to reach the training site – one way? ***[Enter hours and minutes]***			
Hours/Minutes	_ _ HH _ _(MM)	_ _ HH _ _(MM)	_ _ HH _ _(MM)
Refused	89	89	89
Don't know	99	99	99
F6.12. In your opinion, how useful was this training was using a 5 point scale in which 1= "not at all useful" and 5="very useful"?			
Not at all useful	1	1	1
A little useful	2	2	2
Somewhat useful	3	3	3
Useful	4	4	4
Very useful	5	5	5
Refused	89	89	89
Don't know	99	99	99

[Interviewer, if the primary respondent did not respond to F6.1-F6.12, please thank that respondent for his/her time and continue interview with primary respondent (farm operator)].

G. OTHER FARMING EXPERIENCE

G 1. In the past 12 months, from whom have you learned about new agricultural practices? ***[select all that apply]***

G 2. In the past 12 months, from whom did you learn about which crops to cultivate? ***[select all that apply]***

G 3. In the past 12 months, from whom have you learned at what price to sell your product? ***[select all that apply]***

G 4. In the past 12 months, from whom have you received technical advice regarding your farm operation? ***[select all that apply]***

G 5. In the past 12 months, from whom have you learned about preparing business plans, submitting subsidy/credit applications, or agricultural projects? ***[select all that apply]***

	G1	G2	G3	G4	G5
No one	0	0	0	0	0
Marketing Information Systems supported by Agroinform	1	1	1	1	1
Marketing Information Systems supported by ACSA	2	2	2	2	2
MAFI, Raion Department for Agriculture and Food	3	3	3	3	3
Local authorities	4	4	4	4	4
ACED	5	5	5	5	5
Mass media	6	6	6	6	6
Farmers in the same community	7	7	7	7	7
Farmers in other communities	8	8	8	8	8
Family members	9	9	9	9	9
Buyer	10	10	10	10	10
Agroconect.md	11	11	11	11	11
Other	12	12	12	12	12
Refused	89	89	89	89	89
Don't know	99	99	99	99	99

G 6. In the past 12 months, have you looked at a technical bulletin or mailing from the ACED project?

Yes	1
No	2
Refused	89
Don't know	99

G 7. Did you cooperate with another farmer or farmers to market and sell any crops that you both/all cultivated during the 2012 agricultural season?

Yes	1
No	2
Refused	89
Don't know	99

G 8. During the past agricultural season (2012), did your farm experience any weather or pests that adversely affected production? ***[select all that apply]***

None	0
Droughts	1
Heavy storms (Ploi torentiale)	2
Freeze	3
Hail	4
Soil erosion	5
Biotic pests (insects, phytopathogenic contaminants (agenti fitopatogeni), animals)	6
Other severe pests	7
Refused	89
Don't know	99

G 9. Relative to a typical year, during the past agricultural season (2012) did your farm receive:

A lot less rainfall than is typical	1
A little less rainfall than is typical	2
The same amount of rainfall as is typical	3
A little more rainfall than is typical	4
A lot rainfall than is typical	5
Refused	89
Don't know	99

G 10. *During the peak-month of the 2012 agricultural season, how much time did you spend on the different activities listed in the table below in a typical 24-hour time period? Please provide your best estimate. ***[ask for each activity separately]***

	List of Activities	HH/MM	Refused	Don't Know
1	Agricultural work	_ _ /_ _	89	99
2	Non-agricultural work	_ _ /_ _	89	99
3	Household work	_ _ /_ _	89	99
4	Leisure	_ _ /_ _	89	99
5	Personal care (including eating and drinking, bathing, etc.)	_ _ /_ _	89	99
6	Caring for children or other household members	_ _ /_ _	89	99
7	Sleeping or resting	_ _ /_ _	89	99
		Total should sum to 24 hours		

H. IRRIGATION MANAGEMENT, SATISFACTION, AND USAGE - QUESTIONNAIRES A, A-large, C, and C-large ONLY

H 1. Now I'd like to ask you about irrigation on your farm during the 2012 agricultural season.

H1.1. Please tell me, which external irrigation sources were available to your farm if desired, not including irrigation water you accessed directly? Please tell me about all of your land, not just land inside a CIS area. ***Mark all that apply***

For each irrigation source listed in H1.1, ask the following: (go through H1.2-H1.8 for each irrigation source before turning to the next source):

H1.2. Did your farm utilize the irrigation from [SOURCE] during the 2012 agricultural season?

H1.3. Of the water you expected to receive from the source in the previous season, how much was actually received? Evaluate on a 5 point scale where 5 means "all" and 1 means "none".

H1.4. How satisfied are you with the ease of working with other farmers for access to irrigation from [SOURCE]? Evaluate on a 5 point scale where 5 means "highly satisfactory" and 1 means "totally unsatisfactory".

H1.5. How satisfied are you with the water quality (presence of sediment or other elements) from [SOURCE]? Evaluate on a 5 point scale where 5 means "highly satisfactory" and 1 means "totally unsatisfactory".

H1.6. How satisfied are you with the ease of working with [SOURCE] on things like ordering, billing, and other matters? Evaluate on a 5 point scale where 5 means "highly satisfactory" and 1 means "totally unsatisfactory".

H1.7. How satisfied are you with the cost/affordability of irrigation water from [SOURCE]? Evaluate on a 5 point scale where 5 means "highly satisfactory" and 1 means "totally unsatisfactory".

H1.8. How satisfied are you with the timely delivery of irrigation water from [SOURCE]? Evaluate on a 5 point scale where 5 means "highly satisfactory" and 1 means "totally unsatisfactory".

	H1.1. Available irrigation sources (piped irrigation system)				H1.2. Utilized irrigation source				H1.3. Evaluation of received water			H1.4. Satisfaction with ease of working with farmers for access			H1.5. Satisfaction with quality of water			H1.6. Satisfaction with ease of working with source for ordering, billing, etc.			H1.7. Satisfaction with cost			H1.8. Satisfaction with timely delivery		
	Yes	No	Refused	Don't know	Yes	No	Refused	Don't know	Enter point	Refused	Don't know	Enter point	Refused	Don't know	Enter point	Refused	Don't know	Enter point	Refused	Don't know	Enter point	Refused	Don't know	Enter point	Refused	Don't know
	Continue to H1.2	**Skip to next source**			**Continue to H1.3**	**Skip to next source**																				
CIS / Apele Moldovei	1	2	89	99	1	2	89	99		89	99		89	99		89	99		89	99		89	99		89	99
CIS/WUA	1	2	89	99	1	2	89	99		89	99		89	99		89	99		89	99		89	99		89	99
Private Provider	1	2	89	99	1	2	89	99		89	99		89	99		89	99		89	99		89	99		89	99
Other piped system	1	2	89	99	1	2	89	99		89	99		89	99		89	99		89	99		89	99		89	99

H 2. How did your farm's irrigation service in 2012 compare with irrigation service provided in the 2011 agricultural season?

Did not use irrigation in 2011, 2012, or both	0
Much worse	1
Somewhat worse	2
The same	3
Somewhat better	4
Much better	5
Refused	89
Don't know	99

H 3. Did you or members of your farm ever sign a water supply contract? ***select all that apply***

Yes, I/we have had or currently have a contract with a WUA	1
Yes, I/we have had or currently have a contract with Apele Moldovei	2
Yes, I/we have had or currently have a contract with another organization	3
No	4
Refused	89
Don't know	99

H 4. *

	Yes	No	Refused	Don't Know
*H4.1. Have you heard of the United States Millennium Challenge Corporation Compact with Moldova?	1	2	89	
*H4.2. Will the CIS in your village be rehabilitated in the next few years?	1	2 → Skip to H6	89 → Skip to H6	99 → Skip to H6
*H4.3. Have you heard about WUAs being formed in your village?	1	2 → Skip to H6	89 → Skip to H6	
*H4.4. Have you been approached to participate in the rehabilitation process through the WUAs?	1	2	89	99

H 5. Where did you learn about the rehabilitation and the WUAs? ***[Select all that apply]***

From family member / friend / relative	1
Media	2
Newspaper	3
TV	4
Public meeting	5
Primaria meeting	6
Letter	7
Other (Specify) _	
Refused	89
Don't know	99

H 6. *Water Users' Association:

*H6.1. Are you a member of a water users' association?	
Yes	1
No	2 →Skip to H7
Refused	89 → Skip to H7
Don't know	99 → Skip to H7

*H6.2. Do you have a leadership position in a WUA?	
Yes	1 →Skip to H6.4
No	2
Refused	89
Don't know	99
*H6.3. Have you ever had a leadership position in a WUA?	
Yes	1
No	2
Refused	89
Don't know	99
*H6.4. How much input do you have in making decisions in the WUA?	
No input	1
Input into some decisions	2
Input into most decisions	3
Input into all decisions	4
Refused	89
Don't know	99
*H6.5. How often does the WUA meet?	
At least once every two weeks	1
At least once a month	2
Less than once a month	3
Refused	89
Don't know	99
*H6.6. Out of the last 5 meetings, how many did you attend?	
Enter number, must be ≤ 5	
Refused	89
Don't know	99
*H6.7. Have you (or your HH) paid your WUA membership fees for the current period?	
Yes	1
No	2
Refused	89
Don't know	99
*H6.8. Have you (or your HH) paid your irrigation fees for the current period?	
Yes	1
No	2
Refused	89
Don't know	99

H 7. Please rate the degree to which you disagree or agree with the following statements on 5 point scale where 1= "strongly disagree", 3="neither disagree nor agree," and 5= "strongly agree."

	Strongly disagree	Somewhat disagree	Neither agree, nor disagree	Somewhat agree	Strongly agree	Refused	Don't know
H7.1. There is a real advantage to my farm business to being part of a WUA.	1	2	3	4	5	89	99
H7.2. The WUA management is transparent.	1	2	3	4	5	89	99
H7.3. The WUA is really active in organizing and working with farmers.	1	2	3	4	5	89	99
H7.4. Farmers in this area cooperate well.	1	2	3	4	5	89	99
H7.5. The WUA is set up by local leaders to make profit.	1	2	3	4	5	89	99

H 8. Please evaluate the operation of the WUA in your area (village) in the listed aspects on 5 point scale, where 1= "very poor", 3= "satisfactory," and 5 = "very good."

	Very poor	Poor	Satisfactory	Good	Very good	Not applicable (no WUA)	Refused	Don't know/too early to evaluate	Don't know/other reason
H8.1. Adequacy and fairness of irrigation water distribution	1	2	3	4	5	0	89	00	99
H8.2. Irrigation system operations, maintenance, and repairs	1	2	3	4	5	0	89	00	99
H8.3. Collection of irrigation water charges	1	2	3	4	5	0	89	00	99
H8.4. Defense of WUA members' interests	1	2	3	4	5	0	89	00	99

I. CREDIT

I 1. Have you or a member of your household applied for a loan to finance the farm's operations from a bank, a savings and credit association, or a government or donor sponsored credit program, in the <u>past 2 years</u> (since December of 2010)?

Yes	1	***Continue***
No	2	***Skip to I15***
Refused	89	
Don't know	99	

I 2. Have any of these loan applications been approved?

Yes, at least one was approved	1	***Continue***
No, none were approved and none are pending	2	***Skip to I14***
At least one is pending but none were approved	3	
Refused	89	
Don't know	99	

For each of the loans approved during the last 2 years, please tell us:

	Loan 1	Loan 2	Loan 3
I 3. What was the purpose of the loan? What was the loan for? ***[mark all that apply]***			
Purchasing land	1	1	1
Purchasing inputs (for example, fertilizer/pesticides/improved seeds)	2	2	2
Paying for irrigation water	3	3	3
Introducing new crops	4	4	4
Purchasing livestock	5	5	5
Purchasing irrigation equipment	6	6	6
Purchasing other farm equipment (for example, a tractor)	7	7	7
Improvements to existing buildings or infrastructure	8	8	8
Constructing greenhouse	9	9	9
Constructing new buildings or infrastructure for post-harvest activities (e.g., cold storage, packaging, sorting, etc.)	10	10	10
Constructing new buildings or infrastructure for other purposes	11	11	11
Refinancing/covering other loans or debts	12	12	12
Other	13	13	13
Refused	89	89	89
Don't know	99	99	99
I 4. Who applied for the loan?			
Enter household roster code			
Refused	89	89	89
Don't know	99	99	99
I 5. Who made the decision to apply for the loan?			
Enter household roster code			
Refused	89	89	89
Don't know	99	99	99
I 6. Who made the decision about what to do with the money from the loan?			
Enter household roster code			
Refused	89	89	89
Don't know	99	99	99
I 7. What was the source of credit? ***[choose one]***			
RISP	1	1	1
IFAD credit line	2	2	2
Millennium Challenge Account-Moldova credit line or Access to Agricultural Finance (AAF) activity	3	3	3
Other donor credit line	4	4	4
Private or commercial bank's own resources	5	5	5
Micro-credit organization	6	6	6

	Loan 1	Loan 2	Loan 3
Saving and Credit Association	7	7	7
Other (specify) _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _
Refused	89	89	89
Don't know	99	99	99
I 8. When was the loan approved?			
Enter MM /YYYY	_ _ / _ _ _ _	_ _ / _ _ _ _	_ _ / _ _ _ _
Refused	89	89	89
Don't know	99	99	99
I 9. What was the currency of the loan?			
EURO	1	1	1
MDL	2	2	2
USD	3	3	3
Refused	89	89	89
Don't know	99	99	99
I 10. What was the initial size of loan? ***[use the same currency as in I9]***			
Enter amount	_ _ _ _	_ _ _ _	_ _ _ _
Refused	89	89	89
Don't know	99	99	99
I 11. What was the assessed value of collateral? ***[use the same currency as in I9]***			
Enter amount	_ _ _ _	_ _ _ _	_ _ _ _
Refused	89	89	89
Don't know	99	99	99
I 12. What was the term of loan?			
Enter number of months			
Refused	89	89	89
Don't know	99	99	99
I 13. What was the interest rate of the loan?			
Enter interest rate / percent	_ _ , _ _ %	_ _ , _ _ %	_ _ , _ _ %
Refused	89	89	89
Don't know	99	99	99

I 14. If you or a member of your household applied for a loan to finance the farm's operations in the past 2 years (since December of 2010) and were/was rejected, what do you think was the main reason for rejection? ***[select only one]***

No applications were rejected	0	***Skip to section J***
Poor business plan or inability to demonstrate income	1	
Insufficient collateral	2	
Discrimination against farmers/people like me/us	3	
Bad credit history	4	
Repayment too risky	5	
I/we do not have crop insurance	6	
The loan I/we applied for was too small to interest the lender	7	
Other (specify) _ _ _ _ _ _ _ _ _ _ _ _ _		
Refused	89	
Don't know	99	

I 15. What was the main reason for not applying? ***[select only one]***

Did not think I/we would qualify for a loan due to insufficient collateral	1
Did not think I/we would qualify for a loan due to credit history	2
Did not think I/we would qualify for a loan for other reasons	3
The terms of loans available are unfavorable to me/us	4
Afraid I/we would not be able to pay back the loan/ did not wish to get into debt/too risky to take on debt	5
I/we did not know of available loans in my areas/not sure of application process	6
I/we were able to borrow what was needed from family/friends	7
I/we did not need a loan	8
Other (specify) _____	
Refused	89
Don't know	99

J. EMPLOYMENT AND INCOME

J 1. Now I want to ask you some questions regarding the income of you and your household members. ***The list of HH members must be tied to the Household Roster; HH number must be the same; Include information for every household member who is present in the household during the past 12 months and is 16 years old or older. Reenter A1 in column J1.1 and skip J1.2 if J1.1 is not marked***

J 2. What is this person's primary occupation? ***[Ask only for those marked in J1.2; One answer]***

J 3. What was this person's total net income over the past 12 months by following categories? ***[Show card J3; Ask only for those marked in J1.2; indicate amount in THOUSENDS] -89 = Refused; -99 = Don't know***

Household members		***J1. Fill in based on section A***		J2. occupation									J3.Net income over the past 12 months from ***THOUSENDS OF LEI***											
		J1.1. Re-enter A1 (Present in the HH)	**J1.2. Mark all who are 16+ (based on A5)**	Farmer	Employee in agricultural sector	Employee in non-agricultural sector	Self-employer	Student	Pensioner	Other	Refused	Don't know	Privately owned agricultural holding	Work in agricultural sector	Entrepreneurship, handicraft, freelance activity	Work in public non-agricultural sector	Work in private non-agricultural sector	Scholarship	Pensions	Social payments	Support	Remittances	Income from land rental	Other source of income
1	Husband	1	1	1	2	3	4	5	6	8	-89	-99												
2	Wife	2	2	1	2	3	4	5	6	8	-89	-99												
3	Child 1	3	3	1	2	3	4	5	6	8	-89	-99												
4	Child 2	4	4	1	2	3	4	5	6	8	-89	-99												
5	Child 3	5	5	1	2	3	4	5	6	8	-89	-99												
6	Child 4	6	6	1	2	3	4	5	6	8	-89	-99												
7	Child 5	7	7	1	2	3	4	5	6	8	-89	-99												
8	Son in law/daughter in law	8	8	1	2	3	4	5	6	8	-89	-99												
9	Son in law/daughter in law	9	9	1	2	3	4	5	6	8	-89	-99												
10	Grandchild	10	10	1	2	3	4	5	6	8	-89	-99												
11	Grandchild	11	11	1	2	3	4	5	6	8	-89	-99												

12	Grandchild	12	12	1	2	3	4	5	6	8	-89	-99												
13	Grandparent	13	13	1	2	3	4	5	6	8	-89	-99												
14	Grandparent	14	14	1	2	3	4	5	6	8	-89	-99												
15	Other _ _ _ _ _ _ _ _ _ _ _	15	15	1	2	3	4	5	6	8	-89	-99												
16	Other _ _ _ _ _ _ _ _ _ _ _	16	16	1	2	3	4	5	6	8	-89	-99												
17	Other _ _ _ _ _ _ _ _ _ _ _	17	17	1	2	3	4	5	6	8	-89	-99												

K. CONSUMPTION

K 1. How much did your household spend (in MDL) during **the last year not including agricultural expenses**? Please include all household expenses, including food, utilities, clothing, etc., as well as large purchases. ***[Please provide your best estimate]***

K 2. Please estimate the value of agricultural production produced on the farm and consumed by the household during **the past year**. Please include food produced on the garden plot as well as food produced on other plots. ***[Please provide your best estimate]***

		Refused	Don't know
K1. Household consumption expenditure / average for the past year	_ _ _ _ _ Lei	-89	-99
K2. Value of agricultural production produced on the farm and consumed by household	_ _ _ _ _ Lei	-89	-99

S. SPOUSE MODULE

S 1. Please, insert spouse roster code:
Spouse code: _ _ _ _ _ _ _

S 2. Now I'd like to ask you about your farm in general, that is, all land that you cultivate. For each type of land, please tell me (use card BB): ***Use following codes:*** **88 = Not applicable; 89 = Refused; 99 = Don't know**

	Art.12 + Art.82 - 'farming land', i.e. land outside of village/backyards			d. Greenhouses	e. Garden plot	f. Other (pastures, access roads, etc)
	a. Arable land	b. Orchards	c. Vineyards			
*S2.1. Who in your farm decided this season what crops to cultivate where?						
*S1.2. Who in your farm decided this season how much irrigation water to use?						
*S1.2. Who in your farm decided this season when and where to sell crops cultivated?						

S 3. *S3.1. ***Show card B3***. Which of the following assets do you or anyone in your household own? ***Multiple answer***
*S3.2. Who is in charge of/controls this asset? ***Ask for each asset marked in S3.1. Use card BB.***
*S3.3. Who uses the asset most of the time? ***Ask for each asset marked in S3.1.Use card BB.***

	***S3.1**	***S3.2**				***S3.3**			
None	0	Enter code	Not applicable	Refused	Don't know	Enter code	Not applicable	Refused	Don't know
Farm buildings	1		88	89	99		88	89	99
Greenhouse	2		88	89	99		88	89	99
Farm equipment, machinery, and implements	3		88	89	99		88	89	99
Irrigation equipment	4		88	89	99		88	89	99
Refused	89								
Don't know	99								

S 4. *Now I want to ask you some questions regarding your current membership of various groups / organizations. ***(These questions do not refer to Water User Association)***

S4.1. Are you a member of any:	A) *Producer / agricultural organization	B) *Agricultural cooperative	C) *Saving and Credit Association

Yes, and it is functional	1	1	1
Yes, but it is not functional	2 →Skip to next column	2 →Skip to next column	2 →Skip to Section S5
No	3 →Skip to next column	3 →Skip to next column	3 →Skip to Section S5
Refused	89 →Skip to next column	89 →Skip to next column	89 →Skip to Section S5
Don't know	99 →Skip to next column	99 →Skip to next column	99 →Skip to Section S5
S4.2. Do you have a leadership position in this group?			
Yes	1	1	1
No	2	2	2
Refused	89	89	89
Don't know	99	99	99
S4.3. How much input do you have in making decisions in this group?			
No input	1	1	1
Input into some decisions	2	2	2
Input into most decisions	3	3	3
Input into all decisions	4	4	4
Refused	89	89	89
Don't know	99	99	99

S 5. *During the peak-month of the 2012 agricultural season, how much time did you spend on the different activities listed in the table below in a typical 24-hour time period? Please provide your best estimate. ***[ask for each activity separately]***

	List of Activities	HH/MM	Refused	Don't Know
1	Agricultural work	_ _/_ _	89	99
2	Non-agricultural work	_ _/_ _	89	99
3	Household work	_ _/_ _	89	99
4	Leisure	_ _/_ _	89	99
5	Personal care (including eating and drinking, bathing, etc.)	_ _/_ _	89	99
6	Caring for children or other household members	_ _/_ _	89	99
7	Sleeping or resting	_ _/_ _	89	99
		Total should sum to 24 hours		

S 6. * Questionnaire A, A-large, C, and C-large ONLY

	Yes	No	Refused	Don't Know
*S6.1. Have you heard of the United States Millennium Challenge Corporation Compact with Moldova?	1	2	89	
*S6.2. Will the CIS in your village be rehabilitated in the next few years?	1	2 → Skip to S7	89 → Skip to S7	99 → Skip to S7
*S6.3. Have you heard about WUAs being formed in your village?	1	2 → Skip to S7	89 → Skip to S7	
*S6.4. Have you been approached to participate in the rehabilitation process through the WUAs?	1	2	89	99

S 7. *Water Users' Association: Questionnaire A, A-large, C, and C-large ONLY

*S7.1. Are you a member of a water users' association?	
Yes	1
No	2 →Skip to Go to the last page
Refused	89 → Skip to Go to the last page
Don't know	99 → Skip to Go to the last page
*S7.2. Do you have a leadership position in a WUA?	
Yes	1 →Skip to S7.4
No	2
Refused	89
Don't know	99
*S7.3. Have you ever had a leadership position in a WUA?	
Yes	1
No	2
Refused	89
Don't know	99
*S7.4. How much input do you have in making decisions in the WUA?	
No input	1
Input into some decisions	2
Input into most decisions	3
Input into all decisions	4
Refused	89
Don't know	99
*S7.5. How often does the WUA meet?	
At least once every two weeks	1
At least once a month	2
Less than once a month	3
Refused	89
Don't know	99
*S7.6. Out of the last 5 meetings, how many did you attend?	
Enter number, must be ≤ 5	
Refused	89
Don't know	99
*S7.7. Have you (or your HH) paid your WUA membership fees for the current period?	
Yes	1
No	2
Refused	89
Don't know	99
*S7.8. Have you (or your HH) paid your irrigation fees for the current period?	
Yes	1
No	2
Refused	89
Don't know	99

Questionnaire #

Explain the respondent that this is a longitudinal survey and that we will probably need to contact him / her in the future for participation. Tell that the names and contact information will be kept confidential and will not be disclosed to the third party.

Reenter farm operator code	

			Respondent	**Spouse (if applicable)**	**Training attendee (if applicable)**	**Alternative contact person**	
1	**Name / Surname**						
2	**Relation to respondent**					**Family member/Relative**	**1**
						Friend	**2**
						Neighbor	**3**
						Other	**4**
3	**Telephone number**						
4	**Alternative telephone number**						
5	**Address**	**CIS area (if applicable)**					
		Region					
		Raion					
		Primaria					
		Settlement (village / town)					
		Detailed address					

APPENDIX E

LARGE FARM QUESTIONNAIRE

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Questionnaire #

MOLDOVA LARGE SIZED FARM BASELINE (2012)

Introduction speech:

[Interviewer presents himself, explains what the survey is about; DOES NOT state that it is linked to a potential irrigation project or training program. Tell the respondent that the survey aims to study condition of farmer in Moldova and identify their needs and problems. The survey in being conducted by the Non Governmental Organization Agribusiness Development Institute (ADI, Moldova) and will be of longitudinal character. So the follow up contacts will occur in future years.**]**

a. Direction on administering the questionnaire; explain the survey is voluntary and confidential.

	Name	**Code**
Q 1. Region		
Q 2. District/rayon		
Q 3. Settlement/ village		

INTERVIEWER VISITS				
		Q 4. Visit 1	**Q 5.** Visit 2	**Q 6.** Visit 3 - final
1. Date *[DD] [MM] [YYYY]*		[_ _] [_ _] [_ _ _ _]	[_ _] [_ _] [_ _ _ _]	[_ _] [_ _] [_ _ _ _]
2. Interviewer		name: _ _ _ _ _ _ _ ID: _ _ _ _ _	name: _ _ _ _ _ _ _ ID: _ _ _ _ _	name: _ _ _ _ _ _ _ ID: _ _ _ _ _
3. Interview time	Start *[HH] [MM]*	[_ _] [_ _]	[_ _] [_ _]	[_ _] [_ _]
	End *[HH] [MM]*	[_ _] [_ _]	[_ _] [_ _]	[_ _] [_ _]
4. Visit result		[_ _]	[_ _]	[_ _]
5. Appointment for the next visit	Date *[DD] [MM] [YYYY]*	[_ _] [_ _] [_ _ _ _]	[_ _] [_ _] [_ _ _ _]	
	Time *[HH] [MM]*	[_ _] [_ _]	[_ _] [_ _]	
	Location	_ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _	

Interview result codes:

Interview completed	1	
No one home	2	***Make next appointment***
Farmer not available	3	***Make next appointment***
Incomplete	4	
Refused	5	
No eligible farmer in	6	
Farm not located	7	
Other (Specify) _ _ _ _ _ _		

To be completed after interview:

	Name	ID
Q 7. Regional Coordinator		
Q 8. District Coordinator		
Q 9. Field Manager		
Q 10. Revision Specialist		
Q 11. Data entry clerk #1		
Q 12. Data entry clerk #2		

Q 13. Quality control result: **To be completed after interview:**

Quality control procedure was conducted	1	Date: [_ _] [_ _] [_ _ _ _]
Quality control procedure was not conducted	2	

VERSION A

		Name / text	Code
X. 1	CIS		
X. 2	Cadastral code		
X. 3	Plot area		
X. 4	Plot owner		
X. 5	Farm area		
X. 6	Farm operator/respondent		

Before beginning the survey, I would like to ask you a question to determine if you are eligible to complete the survey.

I'd like to learn more about *this* plot of land. [Interviewer: show the respondent the cadastral code and point out the plot on a map.]

Screener1. During the 2012 agricultural season, did your farm operation operate on this plot?

Yes, my farm operation cultivated crops on this plot	1	***"You are eligible to complete the survey." Continue***
Yes, my farm operation operated this plot, even though it was uncultivated	2	***"You are eligible to complete the survey." Continue***
No, I did not have control over what happened on this plot	3	***Mark as not eligible in Q4-Q6; ask field supervisor to provide replacement***
Refused	89	***Code interview result as refusal (Q4-Q6); ask field supervisor to provide replacement***
Don't know	99	***Code interview result as "other"; Ask field supervisor to provide replacement***

VERSION B

		Name / text	Code
X.5	Farm area		
X.6	Farm operator/respondent		

Before beginning the survey, I would like to ask you a question to determine if you are eligible to complete the survey.

Screener2. I'd like to ask about the crops that your farm operation cultivated during the 2012 agricultural season. Did your farm operation cultivate any of the following in a field: apples, plums, peaches, sweet cherries, almonds, walnuts, table grapes? Or did your farm operation cultivate any of the following in a greenhouse: tomatoes, cucumbers, peppers, salad greens, or culinary herbs?

Yes (at least one)	1	***"You are eligible to complete the survey." Continue***
No	2	***End interview, code as 6 (ineligible) in Q4-Q6; ask field supervisor to provide replacement***
Refused	89	***End interview, code as 5 (refused) in Q4-Q6; as field supervisor to provide replacement***
Don't know	99	***End interview, code as other in Q4-Q6; ask field supervisor to provide replacement***

VERSION C

		Name / text	Code
X. 1	CIS		
X. 2	Cadastral code		
X. 3	Plot area		
X. 4	Plot owner		
X. 5	Farm area		
X. 6	Farm operator/respondent		

Before beginning the survey, I would like to ask you a few questions to determine if you are eligible to complete the survey.

I'd like to learn more about *this* plot of land. [Interviewer: show the respondent the cadastral code and point out the plot on a map.]

Screener1. During the 2012 agricultural season, did your farm operation operate on this plot?

Yes, my farm operation cultivated crops on this plot	1	***"You are eligible to complete the survey." Continue to Section A***
Yes, my farm operation operated this plot, even though it was uncultivated	2	***"You are eligible to complete the survey." Continue to Section A***
No, I did not have control over what happened on this plot	3	***Continue to Screener 2***
Refused	89	***Code interview result as refusal (Q4-Q6); ask field supervisor to provide two replacements: one for ISRA-CISRA and one for ACED***
Don't know	99	***Code interview result as other; ask field supervisor to provide two replacements: one for ISRA-CISRA and one for ACED***

Screener2. I'd like to ask about the crops that your farm operation cultivated during the 2012 agricultural season. Did your farm operation cultivate any of the following in a field: apples, plums, peaches, sweet cherries, almonds, walnuts, table grapes? Or did your farm operation cultivate any of the following in a greenhouse: tomatoes, cucumbers, peppers, salad greens, or culinary herbs?

Yes (at least one)	1	***"You are eligible to complete the survey." Continue; exclude section D and H from the questionnaire***
No	2	***End interview, code as 6 (ineligible) in Q4-Q6; ask field supervisor to provide two replacements: one for ISRA-CISRA and one for ACED***
Refused	89	***End interview, code as 5 (refused) in Q4-Q6; ask field supervisor to provide two replacements: one for ISRA-CISRA and one for ACED***
Don't know	99	***End interview, code as other in Q4-Q6; ask field supervisor to provide two replacements: one for ISRA-CISRA and one for ACED***

VERSION A-LARGE

		Name / text	Code
X. 1	CIS		
X. 2.A	Cadastral code		
X. 3.A	Plot area		
X. 4.A	Plot owner		
X. 2.B	Cadastral code		
X. 3.B	Plot area		
X. 4.B	Plot owner		
X. 2.C	Cadastral code		
X. 3.C	Plot area		
X. 4.C	Plot owner		
X. 5	Farm area		
X. 6	Farm operator/respondent		

VERSION B-LARGE

		Name / text	Code
X.5	Farm area		
X.6	Farm operator/respondent		

Before beginning the survey, I would like to ask you a question to determine if you are eligible to complete the survey.

Screener2. I'd like to ask about the crops that your farm operation cultivated during the 2012 agricultural season. Did your farm operation cultivate any of the following in a field: apples, plums, peaches, sweet cherries, almonds, walnuts, table grapes? Or did your farm operation cultivate any of the following in a greenhouse: tomatoes, cucumbers, peppers, salad greens, or culinary herbs?

Yes (at least one)	1	***"You are eligible to complete the survey." Continue***
No	2	***End interview, code as 6 (ineligible) in Q4-Q6***
Refused	89	***End interview, code as 5 (refused) in Q4-Q6***
Don't know	99	***End interview, code as other in Q4-Q6***

VERSION C-LARGE

		Name / text	Code
X. 1	CIS		
X. 2.A	Cadastral code		
X. 3.A	Plot area		
X. 4.A	Plot owner		
X. 2.B	Cadastral code		
X. 3.B	Plot area		
X. 4.B	Plot owner		
X. 2.C	Cadastral code		
X. 3.C	Plot area		
X. 4.C	Plot owner		
X. 5	Farm area		
X. 6	Farm operator/respondent		

A. FARM INFORMATION

I would like to ask you some questions about your farm:

A 1. What is your role on the farm? ***[one answer]***

Owner	1	Skip to A3
Shareholder	2	Skip to A3
Employee	3	Continue
Other	4	
Refused	89	Skip to A3
Don't know	99	Skip to A3

A 2. What is your position on the farm? And how many years have you been working in that position? ***[specify position and number of years]***

	Position	Number of years
	_ _ _ _	_ _ _ _
Refused	89	89
Don't know	99	99

A 3. When was your farm founded? ***[enter year]***

Year	_ _ _ _
Refused	89
Don't know	99

A 4. What is the legal status of the business / farm? ***[one answer]***

Limited company	1
Joint stock company	2
Cooperative	3
Individual entrepreneur	4
Partnership	5

Association / union	6
Taxing physical entity	7
Peasant farm	8
Other (specify) _ _ _ _ _ _ _ _ _ _	
Refused	89
Don't know	99

A 5. What is the ownership status of the farm? ***[one answer]***

Private business	1	Continue
State owned	2	Skip to A8
Joint ownership	3	Continue
Refused	89	
Don't know	99	

A 6. How many private persons / households own the farm? ***[enter number of owners]***

Number of owners	_ _ _ _
Refused	89
Don't know	99

A 7. Now let me ask some questions about the owners of the farm:

A7.1. List of owners (person or family) ***If the respondent is an owner start with him / her; you don't need to list the names of the owners.***	A7.2. Is this person male or female?				A7.3. How old is (he/she)? (Years)			A7.4. What is (his/her) highest level of education? 1. No education or primary 2. Gymnasium / 8 grades 3. Lyceum, secondary general / 10 grades 4. Secondary specialized / SPT 5. Secondary vocational / Technicum 6. Higher 89. Refused 99. DK	A7.5. Years of experience on the particular farm 89. Refused 99. Don't know	A7.6. Years of experience in farming business 89. Refused 99. Don't know	A7.7. Is this person employed in the farm			
	Male	Female	Refused	Don't know	Enter digits	Refused	Don't know				Yes	No	Refused	Don't know
Owner #1	1	2	89	99		899	999				1	2	89	99
Owner #2	1	2	89	99		899	999				1	2	89	99
Owner #3	1	2	89	99		899	999				1	2	89	99
Owner #4	1	2	89	99		899	999				1	2	89	99
Owner #5	1	2	89	99		899	999				1	2	89	99
Owner #6	1	2	89	99		899	999				1	2	89	99
Owner #7	1	2	89	99		899	999				1	2	89	99
Owner #8	1	2	89	99		899	999				1	2	89	99
Owner #9	1	2	89	99		899	999				1	2	89	99
Owner #10	1	2	89	99		899	999				1	2	89	99

A 8. Could you please specify number of paid employees: ***If respondent knows approximate number, write in the number he/she names. If respondent doesn't know the number of employees please ask them if it is possible to consult their records. If they do not know the number and cannot retrieve it from the records please write code "999" to relevant cell; if respondent refuses to name the number, write in the code "899"; if respondent doesn't have any type of the employees in particular time period, write in "0".***

	A8.1. Year round	A8.2. Seasonal	
	Number	Number	Average hours worked per season
Paid employees			
1. Men			_ _ HH
2. Women			_ _ HH

A 9. Could you please specify total reimbursement for your paid employees (Lei in total) in the following categories: ***Please estimate the value of in-kind payments. If respondent doesn't know the amount of payment of employees please ask them to consult their records. If they do not know the amount and cannot retrieve it from the records please write code "99" to relevant cell; if respondent refuses to name the amount, write in the code "89"; if respondent doesn't pay any salary in particular time period, write in "0".***

	A9.1. Year round (the total annual amount paid)	A9.2. Seasonal (the total annual amount paid to seasonal workers)
Paid employees		
1. Men		
2. Women		

B.FARM, AND COMMUNITY CHARACTERISTICS

B 1. I'd like to learn more about the agricultural land owned and land cultivated by you and other members of your farm **in the period 01 November 2011 – 31 October 2012 (the season)**. Please do not include land owned or operated for non-agricultural purposes.

***Instruction: For the questions related to area, ask the respondent to provide the best estimate of size. Use following codes:* -88 = Not applicable; -89 = Refused; -99 = Don't know**

	Art.12 + Art.82 - 'farming land', i.e. land outside of village/backyards			d. Greenhouses m^2	e. Garden plot (excl. greenhouses) ha, ares ***Specify the measurement unit***	f. Other (pastures, access roads, etc) ha, ares
	a. Arable land ha, ares	b. Orchards ha, ares	c. Vineyards ha, ares			
B1.1. Area of land owned?	_ _ _ _,_ _ ***If zero, skip to B1.4***	_ _ _ _,_ _ ***If zero, skip to B1.4***	_ _ _ _,_ _ ***If zero, skip to B1.4***	_ _ _ _,_ _ ***If zero, skip to B1.4***	_ _ _ _,_ _ . . . . ***unit If zero, skip to B1.4***	_ _ _ _,_ _ ***If zero, skip to B1.4***
B1.2. Of owned land, area rented out to others?	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _ . . . . . ***unit***	_ _ _ _,_ _
B1.3. Of owned land, area given to use for free to others?	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _ . . . . . ***unit***	_ _ _ _,_ _
B1.4. Area of land rented from others?	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _ . . . . . ***unit***	_ _ _ _,_ _
B1.5. Area of land taken for free for use from others	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _ . . . . . ***unit***	_ _ _ _,_ _
B1.6. Total area available for use? (B1.1–B1.2.- B1.3.+ B1.4+B1.5)	_ _ _ _,_ _ ***If zero, skip B1.7–B2.3***	_ _ _ _,_ _ ***If zero, skip B1.7–B2.3***	_ _ _ _,_ _ ***If zero, skip B1.7–B2.3***	_ _ _ _,_ _ ***If zero, skip B1.7–B2.3***	_ _ _ _,_ _ . . . . . ***unit If zero, skip B1.7-B2.3***	_ _ _ _,_ _ ***If zero, skip B1.7–B2.3***
B1.7. Total area cultivated (must be less than or equal to B1.6)	_ _ _ _,_ _ ***If zero, skip B1.8–B2.3***	_ _ _ _,_ _ ***If zero, skip B1.8–B2.3***	_ _ _ _,_ _ ***If zero, skip B1.8–B2.3***	_ _ _ _,_ _ ***If zero, skip B1.8–B2.3***	_ _ _ _,_ _ . . . . . ***unit If zero, skip B1.8–B2.3***	_ _ _ _,_ _ ***If zero, skip B1.8–B2.3***
B1.8. How much of cultivated land was located in a CIS command area (functional or not)? (must be less than or equal to B1.7)	_ _ _ _,_ _ ***If zero, skip B1.9***	_ _ _ _,_ _ ***If zero, skip B1.9***	_ _ _ _,_ _ ***If zero, skip B1.9***	_ _ _ _,_ _ ***If zero, skip B1.9***	_ _ _ _,_ _ . . . . . ***unit If zero, skip B1.9***	_ _ _ _,_ _ ***If zero, skip B1.9***
B1.9. How much of cultivated land in a CIS command area did you irrigate during the 2012	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _	_ _ _ _,_ _		_ _ _ _,_ _

agricultural season? (must be less than or equal to B1.8)						

B 2. ***Show card B3***. Which of the following assets does your farm own? ***Multiple answer***

None	0
Farm buildings	1
Greenhouse	2
Farm equipment, machinery, and implements	3
Irrigation equipment	4
Refused	89
Don't know	99

B 3. How close is the nearest cold storage facility to your farm? ***[One answer]***

Less than 1 km	1
Between 1-5 km	2
Between 5-10 km	3
Between 10-15 km	4
More than 15 km	5
Refused	89
Don't know	99

B 4. B4.1. Did you <u>own</u> a cold storage facility for storing your crops during the 2012 season? ***[One answer]***
B4.2. Did you <u>rent</u> space in a cold storage facility to store your crops during the 2012 season? ***[One answer]***
B4.3. Did you sell your crops to an individual or enterprise <u>who stored</u> them in a cold storage facility during the 2012 season? ***[One answer]***

	B4.1	B4.2	B4.3
Yes	1	1	1
No	2	2	2
Refused	89	89	89
Don't know	99	99	99

If B4.1 = "Yes" (1) or B4.2 = "Yes" (1), continue. If they are BOTH no (or don't know or refused), skip to B8.

B 5. ***Ask this question if "yes" (code 1) in B4.1 or B4.2*** How many tones did you store in a cold storage facility in the 2012 season?

Tones	_ _ _ _ _ tone
Refused	89
Don't know	99

B 6. ***Ask this question if "yes" (code 1) in B4.1 or B4.2*** What was the total capacity of the cold storage facility or facilities that you used in the 2012 season?

Tones	_ _ _ _ _ tone
Refused	89
Don't know	99

B 7. ***Ask this question if "yes" (code 1) in B4.1 or B4.2*** How many farm operations, individuals, or enterprises other than you stored crops in the cold storage facility or facilities that you used in the 2012 season?

Farm operations, individuals, or enterprises	_ _ _ _ _ N
Refused	89
Don't know	99

B 8. How much irrigation water did you use on your farm during the 2012 agricultural season?

m^3	_ _ _ _ _ m^3
Refused	89
Don't know	99

B 9. *Now I want to ask you some questions regarding your current membership of various groups / organizations. ***(These questions do not refer to Water User Association)***

B9.1. Are you a member of any:	A) *Producer / agricultural organization	B) *Agricultural cooperative	C) *Saving and Credit Association
Yes, and it is functional	1	1	1
Yes, but it is not functional	2 →Skip to next column	2 →Skip to next column	2 →Skip to Section C
No	3 →Skip to next column	3 →Skip to next column	3 →Skip to Section C
Refused	89 →Skip to next column	89 →Skip to next column	89 →Skip to Section C
Don't know	99 →Skip to next column	99 →Skip to next column	99 →Skip to Section C
B9.2. Do you have a leadership position in this group?			
Yes	1	1	1
No	2	2	2
Refused	89	89	89
Don't know	99	99	99
B9.3. How much input do you have in making decisions in this group?			
No input	1	1	1
Input into some decisions	2	2	2
Input into most decisions	3	3	3
Input into all decisions	4	4	4
Refused	89	89	89
Don't know	99	99	99

C. FARM PRODUCTION, REVENUE, AND COSTS

Now I'd like to ask you some questions about crop production and revenue in field plots and greenhouses during the 2012 agricultural season. Please include all crops cultivated by your farm, except those solely for personal consumption. When answering these questions, please tell me about the 2012 agricultural season (**01 November 2011 – 31 October 2012)** only.

C 1. In the 2012 agricultural season, please tell me, which crops did your farm cultivate? ***Show crop card***
C 2. For each cultivated crop, on how much land did you cultivate this crop in (1) a field in a CIS command area, (2) a field outside a CIS command area, (3) a greenhouse in a CIS command area, and (4) a greenhouse outside a CIS command area? ***[ask for each crop marked in C1]***
C 3. For each cultivated crop, how much was irrigated/watered? ***[ask for each crop marked in C1]***
C 4. If crop is grown in an orchard or vineyard, Approximately how many tree/vines did you cultivate? ***[ask for each crop marked in C1 that is grown in an orchard or vineyard.]***
C 5. For each cultivated crop, please tell me the volume harvested in tones. ***[ask for each crop marked in C1; if 0, skip to next crop]***
C 6. For each cultivated crop, please tell me the volume sold (1) in tones and (2) in thousands of Lei. ***[ask for each crop marked in C1]***
C 7. Which months did you sell the crop? ***[ask for each crop >0 in C6; multiple answers***]
C 8. Did you sell this crop on the local market or did you export it? ***[ask for each crop >0 in C6; mark all that apply]***
***Use following codes:* -89 = Refused; -99 = Don't know**

Crop	C1. Cultivated crops	C2. Area				C3. Area irrigated, ha	C4. Number of trees/vines	C5. Harvested – tones	C6. Sold		C7. Months: 1..12	C8. Destination of products			
		Field In CIS, ha	Field Outside CIS, ha	Greenhouse in CIS, m^2	Greenhouse Outside CIS, m^2				Tones	Lei (thousands)		Local Market	Export	Refused	Don't know
Wheat	1										__, __, __ , __	1	2	89	99
Rye	2										__, __, __ , __	1	2	89	99
Barley	3										__, __, __ , __	1	2	89	99
Oats	4										__, __, __ , __	1	2	89	99
Corn	5										__, __, __ , __	1	2	89	99
Pea	6										__, __, __ , __	1	2	89	99
Bean	7										__, __, __ , __	1	2	89	99
Tobacco	8										__, __, __ , __	1	2	89	99
Sunflower	9										__, __, __ , __	1	2	89	99
Rape	10										__, __, __ , __	1	2	89	99

Crop	C1. Cultivated crops	C2. Area				C3. Area irrigated, ha	C4. Number of trees/vines	C5. Harvested – tones	C6. Sold		C7. Months: 1..12	C8. Destination of products			
		Field In CIS, ha	Field Outside CIS, ha	Greenhouse in CIS, m^2	Greenhouse Outside CIS, m^2				Tones	Lei (thousands)		Local Market	Export	Refused	Don't know
Soybean	11										__, __, __ , __	1	2	89	99
Medical plants, herbs and spices	12										__, __, __ , __	1	2	89	99
Sugar beet	13										__, __, __ , __	1	2	89	99
Potatoes	14										__, __, __ , __	1	2	89	99
Cabbage	15										__, __, __ , __	1	2	89	99
Tomatoes	16										__, __, __ , __	1	2	89	99
Pepper	17										__, __, __ , __	1	2	89	99
Onion	18										__, __, __ , __	1	2	89	99
Cucumbers	19										__, __, __ , __	1	2	89	99
Carrot	20										__, __, __ , __	1	2	89	99
Sal. greens	21										__, __, __ , __	1	2	89	99
Cul. herbs	22										__, __, __ , __	1	2	89	99
Oth. veg.	23										__, __, __ , __	1	2	89	99
W.melons	24										__, __, __ , __	1	2	89	99
Fodder plants	25										__, __, __ , __	1	2	89	99
Seeds	26										__, __, __ , __	1	2	89	99
Seedlings (item)	27										__, __, __ , __	1	2	89	99
Flowers and ornament. plants (item)	28										__, __, __ , __	1	2	89	99
Other arable crops	29										__, __, __ , __	1	2	89	99
Natural pastures and hayfields	30										__, __, __ , __	1	2	89	99
Apples	31										__, __, __ , __	1	2	89	99
Pears	32										__, __, __ , __	1	2	89	99
Cherry	33										__, __, __ , __	1	2	89	99
Sweet cherry	34										__, __, __ , __	1	2	89	99

Crop	C1. Cultivated crops	C2. Area				C3. Area irrigated, ha	C4. Number of trees/vines	C5. Harvested – tones	C6. Sold		C7. Months: 1..12	C8. Destination of products			
		Field In CIS, ha	Field Outside CIS, ha	Greenhouse in CIS, m^2	Greenhouse Outside CIS, m^2				Tones	Lei (thousands)		Local Market	Export	Refused	Don't know
Plums	35										__, __, __ , __	1	2	89	99
Peaches	36										__, __, __ , __	1	2	89	99
Nectarines	37										__, __, __ , __	1	2	89	99
Apricot	38										__, __, __ , __	1	2	89	99
Other fruit from trees	39										__, __, __ , __	1	2	89	99
Walnuts	40										__, __, __ , __	1	2	89	99
Almonds	41										__, __, __ , __	1	2	89	99
Str.berries	42										__, __, __ , __	1	2	89	99
Shrubs (item)	43										__, __, __ , __	1	2	89	99
Table grape	44										__, __, __ , __	1	2	89	99
Wine	45										__, __, __ , __	1	2	89	99
Other plants grown in a nursery	46										__, __, __ , __	1	2	89	99
Other perennial	47										__, __, __ , __	1	2	89	99

C 9. Where did you sell the crop? ***[ask for each crop >0 in C6, mark all that apply]***
C 10. To whom did you sell the crop? ***[ask for each crop >0 in C6, mark all that apply]***
C 11. Volume of the harvest left to be sold***? [ask for each crop >0 in C5]***
C 12. Volume of the harvest paid to hired labor or bartered? ***[ask for each crop >0 in C5]***
C 13. Volume of the harvest damaged / destroyed***? [ask for each crop >0 in C5]***
C 14. Did you store any of your 2012 harvest of this crop in a cold storage facility? ***[ask for each crop >0 in C5]***
Use following codes: **-89 = Refused; -99 = Don't know**

Crop	C1. Cultivated crops	C9. Point of Sale							C10. Buyer of the product									C11. To be sold – tones	C12. Paid to labor / bartered	C13. Damaged / destroyed	C14. Cold storage			
		Farm gate/road side	Local market (informal)	Local market (formal)	Regional market	Other than local/regional market	Refused	Don't know	End consumer (direct)	Trader/intermediary	Cooperative (Marketing)	Packing center	Processor	Retailer	Other	Refused	Don't know				Yes	No	Refused	Don't know
Wheat	1	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Rye	2	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Barley	3	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Oats	4	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Corn	5	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Pea	6	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Bean	7	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Tobacco	8	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Sunflower	9	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Rape	10	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Soybean	11	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Medical plants, herbs and spices	12	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Sugar beet	13	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Potatoes	14	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Cabbage	15	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Tomatoes	16	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Pepper	17	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99

Crop	C1. Cultivated crops	C9. Point of Sale							C10. Buyer of the product									C11. To be sold – tones	C12. Paid to labor / bartered	C13. Damaged / destroyed	C14. Cold storage			
		Farm gate/road side	Local market (informal)	Local market (formal)	Regional market	Other than local/regional market	Refused	Don't know	End consumer (direct)	Trader/intermediary	Cooperative (Marketing)	Packing center	Processor	Retailer	Other	Refused	Don't know				Yes	No	Refused	Don't know
Onion	18	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Cucumbers	19	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Carrot	20	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Sal. greens	21	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Cul. herbs	22	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Oth. veg.	23	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
W.melons	24	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Fodder plants	25	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Seeds	26	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Seedlings (item)	27	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Flowers and ornament. plants (item)	28	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Other arable crops	29	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Natural pastures and hayfields	30	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Apples	31	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Pears	32	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Cherry	33	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Sweet cherry	34	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Plums	35	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Peaches	36	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Nectarines	37	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Apricot	38	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Other fruit from trees	39	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Walnuts	40	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Almonds	41	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Str.berries	42	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Shrubs (item)	43	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99

Crop	C1. Cultivated crops	C9. Point of Sale							C10. Buyer of the product									C11. To be sold – tones	C12. Paid to labor / bartered	C13. Damaged / destroyed	C14. Cold storage			
		Farm gate/road side	Local market (informal)	Local market (formal)	Regional market	Other than local/regional market	Refused	Don't know	End consumer (direct)	Trader/intermediary	Cooperative (Marketing)	Packing center	Processor	Retailer	Other	Refused	Don't know				Yes	No	Refused	Don't know
Table grape	44	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Wine	45	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Other plants grown in a nursery	46	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99
Other perennial	47	1	2	3	4	5	89	99	1	2	3	4	5	6	7	89	99				1	2	89	99

C 15. ***Show Card C16*** During the 2012 agricultural season, how much (in total, in MDL) did you (your farm) spend on the following? ***[If you don't pay money for any of the listed items but do obtain them, evaluate the value in Lei]***.

	Lei
1. Seeds / seedlings	
2. Organic fertilizers	
3. Mineral fertilizers	
4. Herbicides, fungicides, insecticides, other chemicals	
5. Hired labor	
6. Equipment rentals/tools (including spare parts & fuel)	
7. Bringing to market (including packaging, transportation, marketing, etc.)	
8. Irrigation water	
9. Equipment for drip irrigation	
10. Equipment for sprinklers	
11. Other irrigation costs	
12. Greenhouses	
13. Cold storage construction and maintenance	
14. Cold storage rental payments	
15. Other storage for farm production	
16. Other physical/infrastructure improvements for farm	
17. Repayments of loan principal and interest for agricultural loans	
18. Other taxes related to agricultural production or sales	
19. Rental payments to landowners for agricultural land	
20. Agricultural land purchases	
21. Agricultural land taxes	
22. Agricultural equipment purchase	
Other major farming expenditures (specify) _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _	

D. FOCAL PLOT – QUESTIONNAIRES A, A-Large, C, and C-Large ONLY

If the farmer does not cultivate or does not have control over any one of the selected plots replace the plots from replacement list in order.

	cadastral code
Plot 1	
Plot 2	
Plot 3	

If a replacement plot is used, please enter the cadastral code of the replacement plot in the appropriate box above.

	Plot 1	***Plot 2***	***Plot 3***
Re enter plot size	_ _ _ _ _ Ha	_ _ _ _ _ Ha	_ _ _ _ _ Ha
D 1. My records show that this plot is ***read out plot size*** hectares. Is that correct?			
Yes	1 ⇒ ***skip to D3***	1 ⇒ ***skip to D3***	1 ⇒ ***skip to D3***
No	2	2	2
Refused	89 ⇒ ***skip to D3***	89 ⇒ ***skip to D3***	89 ⇒ ***skip to D3***
Don't know	99 ⇒ ***skip to D3***	99 ⇒ ***skip to D3***	99 ⇒ ***skip to D3***
D 2. How large is **this plot**?			
Enter Ha	_ _ _ _ _ Ha	_ _ _ _ _ Ha	_ _ _ _ _ Ha
Refused	89	89	89
Don't know	99	99	99
D 3. During the 2012 agricultural season, how much area of this plot did you cultivate? ***Enter Ha***			
Enter Ha	_ _ _ _ _ Ha	_ _ _ _ _ Ha	_ _ _ _ _ Ha
Refused	89	89	89
Don't know	99	99	99
D 4. In the 2012 agricultural season, did you own **this plot**? ***[Mark one]***			
Yes	1 ⇒ ***skip to D6***	1 ⇒ ***skip to D6***	1 ⇒ ***skip to D6***
No, I/we rented it	2	2	2
No, but I/we did not pay to use it	3 ⇒ ***skip to D6***	3 ⇒ ***skip to D6***	3 ⇒ ***skip to D6***
Refused	89 ⇒ ***skip to D6***	89 ⇒ ***skip to D6***	89 ⇒ ***skip to D6***
Don't know	99 ⇒ ***skip to D6***	99 ⇒ ***skip to D6***	99 ⇒ ***skip to D6***
D 5. In the 2012 agricultural season, how much (total) have you paid for the use of **this plot**? ***[Insert Lei]***			
Enter Lei	_ _ _ _ _ Ha	_ _ _ _ _ Ha	_ _ _ _ _ Ha
Refused	89	89	89
Don't know	99	99	99

D 6. Now I'd like to ask you some questions about farming on this plot during the 2012 agricultural season:

D6.1. In the 2012 agricultural season, which crops did your farm cultivate on **these plots**? If you cultivated a crop but did not have a harvest, please still provide the crop code. ***[Enter codes from Section C; multiple responses allowed]***

D6.2. For each crop listed in D6.1, of the total volume (tons) of that crop's harvest from all plots during the 2012 agricultural season, what percentage was harvested **from this particular plot**? ***If no harvest of this crop from this plot, enter 0, 889 = Refused; 999 = Don't know***

	D6.1. ***Enter code***	D6.2. ***Enter percent***	D6.1. ***Enter code***	D6.2. ***Enter percent***	D6.1. ***Enter code***	D6.2. ***Enter percent***
No crops cultivated	00 ⇒***Skip next column***		00 ⇒ ***Skip next column***		00 ⇒***Skip to D13***	
Crop 1		_ _ . _ _		_ _ . _ _		_ _ . _ _
Crop 2		_ _ . _ _		_ _ . _ _		_ _ . _ _
Crop 3		_ _ . _ _		_ _ . _ _		_ _ . _ _
Crop 4		_ _ . _ _		_ _ . _ _		_ _ . _ _
Crop 5		_ _ . _ _		_ _ . _ _		_ _ . _ _
Crop 6		_ _ . _ _		_ _ . _ _		_ _ . _ _
Crop 7		_ _ . _ _		_ _ . _ _		_ _ . _ _
Crop 8		_ _ . _ _		_ _ . _ _		_ _ . _ _
Crop 9		_ _ . _ _		_ _ . _ _		_ _ . _ _
Crop 10		_ _ . _ _		_ _ . _ _		_ _ . _ _
Refused	89 ⇒***Skip to D13***		89 ⇒***Skip to D13***		89 ⇒***Skip to D13***	
Don't know	99 ⇒***Skip to D13***		99 ⇒***Skip to D13***		99 ⇒***Skip to D13***	
D 7. In the 2012 agricultural season, what irrigation source was used for **this plot**? ***[Mark all that apply***						
Was not irrigated	0 ⇒***Skip to D9***		0 ⇒***Skip to D9***		0 ⇒***Skip to D9***	
CIS/Apele Moldovei	1		1		1	
CIS/WUA	2		2		2	
Private provider	3		3		3	
Other piped system	4		4		4	
Refused	89		89		89	
Don't know	99		99		99	
D 8. D8.1. Over the 2012 agricultural season, how many cubic meters of water did you use to irrigate **this plot**? ***[Enter m^3]***						
Enter m^3	_ _ _ _ m^3		_ _ _ _ m^3		_ _ _ _ m^3	
Refused	89		89		89	
Don't know	99		99		99	
D8.2. During the 2012 agricultural season, how much did you pay, on average, per cubic meter of irrigation water for **this plot**? ***[Enter Lei per m^3]***						
Enter Lei per m^3	_ _ _ _ Lei/m^3		_ _ _ _ Lei/m^3		_ _ _ _ Lei/m^3	
Refused	89		89		89	
Don't know	99		99		99	
D 9. D9.1. In the 2012 agricultural season, how many hired laborers worked on **this plot**? ***[Enter number of persons]***						
Enter number of persons	_ _ _ _ persons ***If zero, Skip to D10***		_ _ _ _ persons ***If zero, Skip to D10***		_ _ _ _ persons ***If zero, Skip to D10***	
Refused	89		89		89	
Don't know	99		99		99	
D9.2. Please estimate the total amount those laborers were paid for work on **this plot** during the 2012 agricultural season. If the laborers worked on more than one plot, please estimate how much of their wages can be attributed to work on **this plot**. ***[Enter amount in Lei, including value of any in-kind payments]***						
Enter amount in Lei	_ _ _ _ _ Lei		_ _ _ _ _ Lei		_ _ _ _ _ Lei	
Refused	89		89		89	
Don't know	99		99		99	
D 10. ***If this plot includes an orchard or vineyard***, how long ago were the trees or vines planted, on average? ***[enter average number of years]***						

No orchard/vineyard	00 ⇒***Skip to D12***	00 ⇒***Skip to D12***	00 ⇒***Skip to D12***
Number of years	_ _ _ _ years	_ _ _ _ years	_ _ _ _ years
Refused	89 ⇒***Skip to D12***	89 ⇒***Skip to D12***	89 ⇒***Skip to D12***
Don't know	99 ⇒***Skip to D12***	99 ⇒***Skip to D12***	99 ⇒***Skip to D12***
D 11. ***If <u>this plot</u> includes an orchard or vineyard***, approximately how many trees/vines are planted on the plot? ***[enter number of trees/vines]***			
Number of trees	_ _ _ _ _ _ trees	_ _ _ _ _ _ trees	_ _ _ _ _ _ trees
Number of vines	_ _ _ _ _ _ vines	_ _ _ _ _ _ vines	_ _ _ _ _ _ vines
Refused	89	89	89
Don't know	99	99	99
D 12. Is there a greenhouse on **<u>this plot</u>**?			
Yes	1 ⇒***Skip to next column***	1 ⇒***Skip to next section***	1 ⇒***Skip to E***
No	2 ⇒***Skip to next column***	2 ⇒***Skip to next column***	2 ⇒***Skip to E***
Refused	89 ⇒***Skip to next column***	89 ⇒***Skip to next column***	89 ⇒***Skip to E***
Don't know	99 ⇒***Skip to next section***	99 ⇒***Skip to next column***	99 ⇒***Skip to E***
D 13. Why wasn't **<u>this plot</u>** cultivated during the 2012 agricultural season? ***[Mark all that apply]***			
Not yet productive	0	0	0
Fallow	1	1	1
Flooded	2	2	2
Rough-stalk meadow	3	3	3
No available labor	4	4	4
No working capital	5	5	5
Other	6	6	6
Refused	89	89	89
Don't know	99	99	99

E. CROP AND POST HARVESTING PRACTICES/EQUIPMENT

Interviewer:

-Ask about apple practices only if the farm operator cultivates apples, check C1

-Ask about stone fruit (peach/plum/sweet cherry) practices only if the farm operator cultivates peaches, plums, or sweet cherries, check C1

-Ask about table grape practices only if the farm operator cultivates table grapes, check C1

-Ask about vegetable practices only if the farm operator cultivates vegetables – tomatoes, cucumbers, sweet paper, salad greens, culinary herbs, check C1

Now I'd like to ask about practices or equipment that you or others may have used in producing crops on your farm.

E 1. ***Show card E1*** Do you or others who work on your farm know about this practice or equipment?

E 2. During the past agricultural season (2012), did you or others apply/utilize this practice or equipment on your farm? ***[Ask for each practice/equipment marked "Yes" in E1; if the practice is not used, skip to E4]***

E 3. During the past agricultural season (2012), on how many hectares on your farm did you or others apply/utilize this practice or equipment? If you are not sure, please estimate. ***[Ask for each practice/equipment marked "Yes" in E2, enter hectares, rounded to the nearest tenth of a hectare]***

E 4. Why did you or others not use this practice or equipment during the past agricultural season (2012)? ***[Mark all that apply; ask for those practices marked "Yes" in D1, but "No," "Don't know," or "Refused" in E2.]***

E 5. During the previous agricultural season (2011), did you or others apply/utilize this practice or equipment on your farm? ***[Ask for each practice/equipment marked "Yes" in E1]***

E 6. From whom or what did you or others who work on your farm learn about this practice or equipment? ***[Ask for each practice/equipment marked "Yes" in E1, one answer]***

	E1. Knowledge of practice/equip.				E2. Use of practice/equipment				E3. Hectares			E4. Reasons for not using								E5. Use of practice/equipment during last season			
	Yes	No	Refused	Don't know	Yes	No	Refused	Don't know	Enter HA	Refused	Don't know	Costly	Doesn't seem useful	Too complicated	Takes too much time	Used in previous season (if practice is not yearly)	Other	Refused	Don't know	Yes	No	Refused	Don't know
1. Apple	⇒	Skip to next practice			⇒	Skip to E4			Go to E5 after E3			⇒								⇒			
1. implementing intensive orchard systems	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
2. weather stations	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
3. drip irrigation	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
4. water testing	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
5. fertigation	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
6. anti-hail net	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99

7. frost management	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
8. integrated disease and pest management	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
9. fruit thinning to increase size of apples	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
10. picking bags	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
11. harvesting platforms	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
12. wood containers for harvest	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
13. plastic containers for harvest	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
14. color charts	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
15. penetrometers	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
16. cold storage ***(if not using, skip to 20)***	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
17. humidity or temperature control in storage areas	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
18. putting crates or boxes on pallets or using corner boards	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
19. ethylene management (SmartFresh)	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
20. grading and sorting equipment	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
21. humidity or temperature control in packing areas	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
22. modified atmosphere/modified humidity packaging	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
23. tray liners	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
24. open trays	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99

25. punnets	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
26. returnable plastic crates	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
27. pre-cooling	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
2. Table grapes																							
1. cluster thinning	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
2. bark girdling to increase grape size	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
3. growth stimulators	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
4. introducing new varieties	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
5. weather stations	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
6. drip irrigation	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
7. water testing; in other words, testing pH and/ or salt concentration in water used for irrigation	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
8. fertigation (using of fertilizers dissolved in water in drip irrigation)	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
9. anti-hail net	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
10. frost management	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
11. integrated disease and pest management	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
12. harvesting platforms	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
13. putting crates or boxes on pallets or using corner boards for harvesting	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
14. cold storage (if not using, skip to 19)	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99

15. humidity or temperature control in storage areas	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
16. inner packaging/storage (sulfur pads)	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
17. room cooling (forced-air)	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
18. pre-cooling	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
19. putting crates or boxes on pallets or using corner boards for packing	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
20. modified atmosphere/modified humidity packaging	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
21. water-absorbent pads	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
22. open trays	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
23. punnets	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
24. returnable plastic crates	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
3. Tomatoes, cucumbers, sweet paper, salad greens, culinary herbs																								
1. seedling production (if not, skip to 12)	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
2. integrated disease and pest management for seedling production	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
3. micro climate control systems in greenhouses (ventilation, use of double layer film, heating) for seedling production	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
4. introducing new varieties/hybrids for seedling production	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
5. pallets for seedling production trays	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99

6. peat for seedling production	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
7. drip irrigation for seedling production	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
8. water testing for seedling production; in other words, testing pH and/ or salt concentration in water used for irrigation	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
9. fertigation (using of fertilizers dissolved in water in drip irrigation) for seedling production	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
10. supplementary illumination for seedling production	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
11. energy saving techniques and equipment for seedling production such as double tunnels and biomass heating generators	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
12. bumblebees or other techniques to increase tomato pollination in greenhouses (tomatoes only)	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
13. micro climate control systems in greenhouses (ventilation, use of double layer film, heating) for vegetable production	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
14. introducing new varieties/hybrids for vegetable production	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
15. mulching for vegetable production	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
16. drip irrigation for vegetable production	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
17. water testing for vegetable production; in other words, testing pH and/ or salt	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99

concentration in water used for irrigation																								
18. fertigation for vegetable production (using of fertilizers dissolved in water in drip irrigation)	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
19. energy saving techniques and equipment for vegetable production such as double layer or biomass heating generators	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
20. growth stimulators for vegetable production	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
21. support systems for vegetable production	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
22. harvesting platform	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
23. plastic boxes	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
24. putting crates or boxes on pallets or using corner boards	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
25. tray liners	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
26. water-absorbent pads	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
27. open trays	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
28. punnets	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
29. returnable plastic crates	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
4. Stone fruits - peaches, plums, or sweet cherries																								
1. intensive orchard systems; in other words, using new rootstocks, new cultivars, or tree support systems	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99

2. weather stations	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
3. drip irrigation	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
4. water testing; in other words, testing pH and/ or salt concentration in water used for irrigation	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
5. fertigation (using of fertilizers dissolved in water in drip irrigation)	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
6. anti-hail net	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
7. anti-rain nets	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
8. frost management	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
9. manual thinning	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
10. summer pruning	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
11. winter pruning	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
12. testing bud fertility	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
13. canopy training	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
14. horizontal lining of bearing branches	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
15. picking bags	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
16. cold storage (if not using, skip to 21)	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
17. humidity or temperature control in storage areas	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
18. putting crates or boxes on pallets or using corner boards	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
19. ethylene management (SmartFresh)	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99

20. implementing controlled atmosphere in storage	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
21. temperature or humidity control in packing areas	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
22. modified atmosphere/modified humidity packaging	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
23. tray liners	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
24. open trays	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
25. punnets	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99
26. pre-cooling	1	2	89	99	1	2	89	99	----'--	89	99	1	2	3	4	5	6	89	99	1	2	89	99

	E6. Information source									
	Family member	Education	Training session	Expert consultant	Neighbor or other farmer	Media	Technical bulletin by mail	Other	Refused	Don't know
1. Apple										
1. implementing intensive orchard systems	1	2	3	4	5	6	7	8	89	99
2. weather stations	1	2	3	4	5	6	7	8	89	99

3. drip irrigation	1	2	3	4	5	6	7	8	89	99
4. water testing	1	2	3	4	5	6	7	8	89	99
5. fertigation	1	2	3	4	5	6	7	8	89	99
6. anti-hail net	1	2	3	4	5	6	7	8	89	99
7. frost management	1	2	3	4	5	6	7	8	89	99
8. integrated disease and pest management	1	2	3	4	5	6	7	8	89	99
9. fruit thinning to increase size of apples	1	2	3	4	5	6	7	8	89	99
10. picking bags	1	2	3	4	5	6	7	8	89	99
11. harvesting platforms	1	2	3	4	5	6	7	8	89	99
12. wood containers for harvest	1	2	3	4	5	6	7	8	89	99
13. plastic containers for harvest	1	2	3	4	5	6	7	8	89	99
14. color charts	1	2	3	4	5	6	7	8	89	99
15. penetrometers	1	2	3	4	5	6	7	8	89	99
16. cold storage ***(if not using, skip to 20)***	1	2	3	4	5	6	7	8	89	99
17. humidity or temperature control in storage areas	1	2	3	4	5	6	7	8	89	99
18. putting crates or boxes on pallets or using corner boards	1	2	3	4	5	6	7	8	89	99
19. ethylene management (SmartFresh)	1	2	3	4	5	6	7	8	89	99
20. grading and sorting equipment	1	2	3	4	5	6	7	8	89	99
21. humidity or temperature control in packing areas	1	2	3	4	5	6	7	8	89	99
22. modified atmosphere/modified humidity packaging	1	2	3	4	5	6	7	8	89	99
23. tray liners	1	2	3	4	5	6	7	8	89	99

24. open trays	1	2	3	4	5	6	7	8	89	99
25. punnets	1	2	3	4	5	6	7	8	89	99
26. returnable plastic crates	1	2	3	4	5	6	7	8	89	99
27. pre-cooling	1	2	3	4	5	6	7	8	89	99
2. Table grapes										
1. cluster thinning	1	2	3	4	5	6	7	8	89	99
2. bark girdling to increase grape size	1	2	3	4	5	6	7	8	89	99
3. growth stimulators	1	2	3	4	5	6	7	8	89	99
4. introducing new varieties	1	2	3	4	5	6	7	8	89	99
5. weather stations	1	2	3	4	5	6	7	8	89	99
6. drip irrigation	1	2	3	4	5	6	7	8	89	99
7. water testing; in other words, testing pH and/ or salt concentration in water used for irrigation	1	2	3	4	5	6	7	8	89	99
8. fertigation (using of fertilizers dissolved in water in drip irrigation)	1	2	3	4	5	6	7	8	89	99
9. anti-hail net	1	2	3	4	5	6	7	8	89	99
10. frost management	1	2	3	4	5	6	7	8	89	99
11. integrated disease and pest management	1	2	3	4	5	6	7	8	89	99
12. harvesting platforms	1	2	3	4	5	6	7	8	89	99
13. putting crates or boxes on pallets or using corner boards for harvesting	1	2	3	4	5	6	7	8	89	99
14. cold storage (if not using, skip to 19)	1	2	3	4	5	6	7	8	89	99
15. humidity or temperature control in storage areas	1	2	3	4	5	6	7	8	89	99

16. inner packaging/storage (sulfur pads)	1	2	3	4	5	6	7	8	89	99
17. room cooling (forced-air)	1	2	3	4	5	6	7	8	89	99
18. pre-cooling	1	2	3	4	5	6	7	8	89	99
19. putting crates or boxes on pallets or using corner boards for packing	1	2	3	4	5	6	7	8	89	99
20. modified atmosphere/modified humidity packaging	1	2	3	4	5	6	7	8	89	99
21. water-absorbent pads	1	2	3	4	5	6	7	8	89	99
22. open trays	1	2	3	4	5	6	7	8	89	99
23. punnets	1	2	3	4	5	6	7	8	89	99
24. returnable plastic crates	1	2	3	4	5	6	7	8	89	99
3. Tomatoes, cucumbers, sweet paper, salad greens, culinary herbs										
1. seedling production (if not, skip to 12)	1	2	3	4	5	6	7	8	89	99
2. integrated disease and pest management for seedling production	1	2	3	4	5	6	7	8	89	99
3. micro climate control systems in greenhouses (ventilation, use of double layer film, heating) for seedling production	1	2	3	4	5	6	7	8	89	99
4. introducing new varieties/hybrids for seedling production	1	2	3	4	5	6	7	8	89	99
5. pallets for seedling production trays	1	2	3	4	5	6	7	8	89	99
6. peat for seedling production	1	2	3	4	5	6	7	8	89	99
7. drip irrigation for seedling production	1	2	3	4	5	6	7	8	89	99
8. water testing for seedling production; in other words, testing pH and/ or salt concentration in water used for irrigation	1	2	3	4	5	6	7	8	89	99
9. fertigation (using of fertilizers dissolved in water in drip irrigation) for seedling production	1	2	3	4	5	6	7	8	89	99

10. supplementary illumination for seedling production	1	2	3	4	5	6	7	8	89	99
11. energy saving techniques and equipment for seedling production such as double tunnels and biomass heating generators	1	2	3	4	5	6	7	8	89	99
12. bumblebees or other techniques to increase tomato pollination in greenhouses (tomatoes only)	1	2	3	4	5	6	7	8	89	99
13. micro climate control systems in greenhouses (ventilation, use of double layer film, heating) for vegetable production	1	2	3	4	5	6	7	8	89	99
14. introducing new varieties/hybrids for vegetable production	1	2	3	4	5	6	7	8	89	99
15. mulching for vegetable production	1	2	3	4	5	6	7	8	89	99
16. drip irrigation for vegetable production	1	2	3	4	5	6	7	8	89	99
17. water testing for vegetable production; in other words, testing pH and/ or salt concentration in water used for irrigation	1	2	3	4	5	6	7	8	89	99
18. fertigation for vegetable production (using of fertilizers dissolved in water in drip irrigation)	1	2	3	4	5	6	7	8	89	99
19. energy saving techniques and equipment for vegetable production such as double layer or biomass heating generators	1	2	3	4	5	6	7	8	89	99
20. growth stimulators for vegetable production	1	2	3	4	5	6	7	8	89	99
21. support systems for vegetable production	1	2	3	4	5	6	7	8	89	99
22. harvesting platform	1	2	3	4	5	6	7	8	89	99
23. plastic boxes	1	2	3	4	5	6	7	8	89	99
24. putting crates or boxes on pallets or using corner boards	1	2	3	4	5	6	7	8	89	99
25. tray liners	1	2	3	4	5	6	7	8	89	99
26. water-absorbent pads	1	2	3	4	5	6	7	8	89	99

27. open trays	1	2	3	4	5	6	7	8	89	99
28. punnets	1	2	3	4	5	6	7	8	89	99
29. returnable plastic crates	1	2	3	4	5	6	7	8	89	99
4. Stone fruits - peaches, plums, or sweet cherries										
1. intensive orchard systems; in other words, using new rootstocks, new cultivars, or tree support systems	1	2	3	4	5	6	7	8	89	99
2. weather stations	1	2	3	4	5	6	7	8	89	99
3. drip irrigation	1	2	3	4	5	6	7	8	89	99
4. water testing; in other words, testing pH and/ or salt concentration in water used for irrigation	1	2	3	4	5	6	7	8	89	99
5. fertigation (using of fertilizers dissolved in water in drip irrigation)	1	2	3	4	5	6	7	8	89	99
6. anti-hail net	1	2	3	4	5	6	7	8	89	99
7. anti-rain nets	1	2	3	4	5	6	7	8	89	99
8. frost management	1	2	3	4	5	6	7	8	89	99
9. manual thinning	1	2	3	4	5	6	7	8	89	99
10. summer pruning	1	2	3	4	5	6	7	8	89	99
11. winter pruning	1	2	3	4	5	6	7	8	89	99
12. testing bud fertility	1	2	3	4	5	6	7	8	89	99
13. canopy training	1	2	3	4	5	6	7	8	89	99
14. horizontal lining of bearing branches	1	2	3	4	5	6	7	8	89	99
15. picking bags	1	2	3	4	5	6	7	8	89	99
16. cold storage (if not using, skip to 21)	1	2	3	4	5	6	7	8	89	99

17. humidity or temperature control in storage areas	1	2	3	4	5	6	7	8	89	99
18. putting crates or boxes on pallets or using corner boards	1	2	3	4	5	6	7	8	89	99
19. ethylene management (SmartFresh)	1	2	3	4	5	6	7	8	89	99
20. implementing controlled atmosphere in storage	1	2	3	4	5	6	7	8	89	99
21. temperature or humidity control in packing areas	1	2	3	4	5	6	7	8	89	99
22. modified atmosphere/modified humidity packaging	1	2	3	4	5	6	7	8	89	99
23. tray liners	1	2	3	4	5	6	7	8	89	99
24. open trays	1	2	3	4	5	6	7	8	89	99
25. punnets	1	2	3	4	5	6	7	8	89	99
26. pre-cooling	1	2	3	4	5	6	7	8	89	99

E 7. ***Ask this question if the respondent mentioned "Expert consultant" and / or "Neighbor or other farmer," codes 4, 5 in E6.***
You mentioned that you have learned about practices or equipment from a consultation. Please tell me the name of this person and the name of the community and raion where he/she is from (if known)? If you learned about practices or equipment from more than one person, please give the name, community, and raion of the person from whom you learned the most.

		Refused	Don't Know
Name	_ _ _ _ _ _ _	89	99
Community (or Village)	_ _ _ _ _ _ _	89	99
Raion	_ _ _ _ _ _ _	89	99

F. AGRICULTURAL TRAININGS

F 1. Have you heard of agricultural trainings being conducted in your area in the previous 12 months?

Yes	1
No	2
Refused	89
Don't know	99

F 2. Can you please tell me (1) the name of the person (s) from your farm who participated in agricultural training during the previous 12 months and (2) their position? ***[Specify name and position of each person who participated in the training including the respondent]***

	Name / Surname	Position	
None of farm members	00		***If none of the farm members attended training, continue; if the respondent identified himself as training participant, go to F5; If the respondent mentioned other farm member skip to F4***
List of persons who participated in trainings	1. _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ 2. _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ 3. _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ 4. _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ 5. _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _	1. _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ 2. _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ 3. _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ 4. _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ 5. _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _	
Refused	89	89	
Don't know	99	99	

F 3. Why didn't you attend training? ***[multiple answers allowed]***

Trainings were too far away	1	***Skip to section G***
Trainings were too expensive	2	
I did not hear about trainings of interest to me	3	
Trainings were too time-consuming	4	
Training topics were too advanced for me	5	
Training topics were too simple for me	6	
Trainings were focused on crops that are not of interest to me	7	
Had pressing work/business to attend to	8	
Had pressing social obligation	9	
Refused	89	
Don't know	99	

F 4. ***If in F2 respondent did not identify his / her roster code:*** My understanding is that you did not attend any agricultural trainings during the previous 12 months. Is that correct?

Yes	1	***Continue***
No	2	***return to F2 and ask respondent to confirm training participants***
Refused	89	
Don't know	99	

F 5. ***If F2 indicates that more than one person attended training:*** Which member attended the most recent training?

Enter roster line number of training attendee	_ _ _ _ _	***Write person's name in the "training attendee" box on the last page;***
Refused	89	***Skip to section G***
Don't know	99	

If F2 indicates that just one person attended training, write that person's name in the "training attendee" box on the last page.

Continue to F6 with the training attendee. If the training attendee is not available to answer questions, please skip to section G.

F 6.

Training 1: I'd like to ask you some questions about the three most recent trainings that you attended: First, please tell me about the most recent training that you attended… (ask F6.1-F6.12 using "Training 1" column).

Training 2: Did you attend any other trainings in the previous 12 months? If so, please tell me about the next most recent training that you attended… (ask F6.1-F6.12 using "Training 2" column).

Training 3: Did you attend any other trainings in the previous 12 months? If so, please tell me about the next most recent training that you attended… (ask F6.1-F6.12 using "Training 3" column).

	Training 1	Training 2	Training 3
F6.1. When did the training occur? ***[Interviewer: if the date is not in the previous 12 months, ask respondent if he/she attended a more recent training. If not, skip to Section G.]***			
Enter month and year	_ _ / _ _ _ _ MM/YEAR	_ _ / _ _ _ _ MM/YEAR	_ _ / _ _ _ _ MM/YEAR
Refused	89	89	89
Don't know	99	99	99
F6.2. What was the focus of this training? ***[multiple answers allowed]***			
New varieties	1	1	1
Crop profitability	2	2	2
New agricultural practices and modern technologies	3	3	3
Greenhouse building and design	4	4	4
Harvest and post-harvest practices	5	5	5
Production of seedlings	6	6	6
Use of irrigation	7	7	7
Market access	8	8	8
Use of chemicals and fertilizers	9	9	9
Cost analysis	10	10	10
Other (specify)	_ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _
Other (specify)	_ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _
Other (specify	_ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _
Refused	89	89	89
Don't know	99	99	99
F6.3. At any time prior to 2012, had you ever attended a similar training?			

Yes	1	1	1
No	2	2	2
Refused	89	89	89
Don't know	99	99	99
F6.4. On what crop or crops did this training focus? ***[multiple codes allowed; enter crop codes from Section C If the training did not focus on a particular crop, enter 0."]***			
Crop codes	_ _ _ _ _	_ _ _ _ _	_ _ _ _ _
Refused	89	89	89
Don't know	99	99	99
F6.5. Was this training provided by the ACED project, which is sponsored by USAID, MCA-Moldova, and MCC?			
Yes	1 - Skip to F6.7	1 - Skip to F6.7	1 - Skip to F6.7
No	2	2	2
Refused	89	89	89
Don't know	99	99	99
F6.6. Who provided the training? ***[multiple answers allowed]***			
Private provider	1	1	1
MAFI, Raion Department for Agriculture and Food	2	2	2
Extension Service provider (ACSA network)	3	3	3
International TA project	4	4	4
Other (specify)	_ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _
Other (specify)	_ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _
Other (specify)	_ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _
Refused	89	89	89
Don't know	99	99	99
F6.7. How many other members of your farm participated in this training (with you)? ***[Do not include yourself in the count]***			
Insert number	_ _ _	_ _ _	_ _ _
Refused	89	89	89
Don't know	99	99	99
F6.8 Did you share information about practices learned in this training with anyone outside your household who did not attend training? ***[one answer]***			
No practices learned	0	0	0
Yes, in great detail	1	1	1
Yes, in some detail	2	2	2
Yes, very briefly / in passing	3	3	3
No, never spoke about it with another	4	4	4
Refused	89	89	89
Don't know	99	99	99
F6.9. In total, how many hours did you spend in the training? ***[Enter number of hours]***			
Hours	_ _ (HH)	_ _ (HH)	_ _ (HH)
Refused	89	89	89
Don't know	99	99	99
F6.10 In what city/village and raion was the training conducted?			
City / village:	_ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _

Raion:	_ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _
Refused	89	89	89
Don't know	99	99	99
F6.11. How long did it take you to reach the training site – one way? ***[Enter hours and minutes]***			
Hours/Minutes	_ _ HH _ _(MM)	_ _ HH _ _(MM)	_ _ HH _ _(MM)
Refused	89	89	89
Don't know	99	99	99
F6.12. In your opinion, how useful was this training was using a 5 point scale in which 1= "not at all useful" and 5="very useful"?			
Not at all useful	1	1	1
A little useful	2	2	2
Somewhat useful	3	3	3
Useful	4	4	4
Very useful	5	5	5
Refused	89	89	89
Don't know	99	99	99

[Interviewer, if the primary respondent did not respond to F6.1-F6.12, please thank that respondent for his/her time and continue interview with primary respondent (farm operator)].

G. OTHER FARMING EXPERIENCE

G 1. In the past 12 months, from whom have you learned about new agricultural practices? ***[select all that apply]***

G 2. In the past 12 months, from whom did you learn about which crops to cultivate? ***[select all that apply]***

G 3. In the past 12 months, from whom have you learned at what price to sell your product? ***[select all that apply]***

G 4. In the past 12 months, from whom have you received technical advice regarding your farm operation? ***[select all that apply]***

G 5. In the past 12 months, from whom have you learned about preparing business plans, submitting subsidy/credit applications, or agricultural projects? ***[select all that apply]***

	G1	G2	G3	G4	G5
No one	0	0	0	0	0
Marketing Information Systems supported by Agroinform	1	1	1	1	1
Marketing Information Systems supported by ACSA	2	2	2	2	2
MAFI, Raion Department for Agriculture and Food	3	3	3	3	3
Local authorities	4	4	4	4	4
ACED	5	5	5	5	5
Mass media	6	6	6	6	6
Farmers in the same community	7	7	7	7	7
Farmers in other communities	8	8	8	8	8
Family members	9	9	9	9	9
Buyer	10	10	10	10	10
Agroconect.md	11	11	11	11	11
Other	12	12	12	12	12
Refused	89	89	89	89	89
Don't know	99	99	99	99	99

G 6. In the past 12 months, have you looked at a technical bulletin or mailing from the ACED project?

Yes	1
No	2
Refused	89
Don't know	99

G 7. Did you cooperate with another farmer or farmers to market and sell any crops that you both/all cultivated during the 2012 agricultural season?

Yes	1
No	2
Refused	89
Don't know	99

G 8. During the past agricultural season (2012), did your farm experience any weather or pests that adversely affected production? ***[select all that apply]***

None	0
Droughts	1
Heavy storms (Ploi torentiale)	2
Freeze	3
Hail	4
Soil erosion	5
Biotic pests (insects, phytopathogenic contaminants (agenti fitopatogeni), animals)	6
Other severe pests	7
Refused	89
Don't know	99

G 9. Relative to a typical year, during the past agricultural season (2012) did your farm receive:

A lot less rainfall than is typical	1
A little less rainfall than is typical	2
The same amount of rainfall as is typical	3
A little more rainfall than is typical	4
A lot rainfall than is typical	5
Refused	89
Don't know	99

G 10. During the peak-month of the 2012 agricultural season, how much time did you spend on agricultural work in a typical 24-hour time period? Please provide your best estimate.

Time spend on agricultural work (HH)	_ _ (HH)
Refused	89
Don't know	99

H. IRRIGATION MANAGEMENT, SATISFACTION, AND USAGE - QUESTIONNAIRES A, A-large, C, and C-large ONLY

H 1. Now I'd like to ask you about irrigation on your farm during the 2012 agricultural season.

H1.1. Please tell me, which external irrigation sources were available to your farm if desired, not including irrigation water you accessed directly? ***Please tell me about all of your land, not just land inside a CIS area. Mark all that apply***

For each irrigation source listed in H1.1, ask the following: (go through H1.2-H1.8 for each irrigation source before turning to the next source):

H1.2. Did your farm utilize the irrigation from [SOURCE] during the 2012 agricultural season?

H1.3. Of the water you expected to receive from the source in the previous season, how much was actually received? Evaluate on a 5 point scale where 5 means "all" and 1 means "none".

H1.4. How satisfied are you with the ease of working with other farmers for access to irrigation from [SOURCE]? Evaluate on a 5 point scale where 5 means "highly satisfactory" and 1 means "totally unsatisfactory".

H1.5. How satisfied are you with the water quality (presence of sediment or other elements) from [SOURCE]? Evaluate on a 5 point scale where 5 means "highly satisfactory" and 1 means "totally unsatisfactory".

H1.6. How satisfied are you with the ease of working with [SOURCE] on things like ordering, billing, and other matters? Evaluate on a 5 point scale where 5 means "highly satisfactory" and 1 means "totally unsatisfactory".

H1.7. How satisfied are you with the cost/affordability of irrigation water from [SOURCE]? Evaluate on a 5 point scale where 5 means "highly satisfactory" and 1 means "totally unsatisfactory".

H1.8. How satisfied are you with the timely delivery of irrigation water from [SOURCE]? Evaluate on a 5 point scale where 5 means "highly satisfactory" and 1 means "totally unsatisfactory".

	H1.1. Available irrigation sources (piped irrigation system)				H1.2. Utilized irrigation source				H1.3. Evaluation of received water			H1.4. Satisfaction with ease of working with farmers for access			H1.5. Satisfaction with quality of water			H1.6. Satisfaction with ease of working with source for ordering, billing, etc.			H1.7. Satisfaction with cost			H1.8. Satisfaction with timely delivery		
	Yes	No	Refused	Don't know	Yes	No	Refused	Don't know	Enter point	Refused	Don't know	Enter point	Refused	Don't know	Enter point	Refused	Don't know	Enter point	Refused	Don't know	Enter point	Refused	Don't know	Enter point	Refused	Don't know
	Continue to H1.2	**Skip to next source**			**Continue to H1.3**	**Skip to next source**																				
CIS / Apele Moldovei	1	2	89	99	1	2	89	99		89	99		89	99		89	99		89	99		89	99		89	99
CIS/WUA	1	2	89	99	1	2	89	99		89	99		89	99		89	99		89	99		89	99		89	99
Private Provider	1	2	89	99	1	2	89	99		89	99		89	99		89	99		89	99		89	99		89	99
Other piped system	1	2	89	99	1	2	89	99		89	99		89	99		89	99		89	99		89	99		89	99

H 2. How did your farm's irrigation service in 2012 compare with irrigation service provided in the 2011 agricultural season?

Did not use irrigation in 2011, 2012, or both	0
Much worse	1
Somewhat worse	2
The same	3
Somewhat better	4
Much better	5
Refused	89
Don't know	99

H 3. Did you or members of your farm ever sign a water supply contract? ***select all that apply***

Yes, I/we have had or currently have a contract with a WUA	1
Yes, I/we have had or currently have a contract with Apele Moldovei	2
Yes, I/we have had or currently have a contract with another organization	3
No	4
Refused	89
Don't know	99

H 4.

	Yes	No	Refused	Don't Know
H4.1. Have you heard of the United States Millennium Challenge Corporation Compact with Moldova?	1	2	89	
H4.2. Will the CIS in your village be rehabilitated in the next few years?	1	2 → Skip to H6	89 → Skip to H6	99 → Skip to H6
H4.3. Have you heard about WUAs being formed in your village?	1	2 → Skip to H6	89 → Skip to H6	
H4.4. Have you been approached to participate in the rehabilitation process through the WUAs?	1	2	89	99

H 5. Where did you learn about the rehabilitation and the WUAs? ***[Select all that apply]***

From family member / friend / relative	1
Media	2
Newspaper	3
TV	4
Public meeting	5
Primaria meeting	6
Letter	7
Other (Specify) _	
Refused	89
Don't know	99

H 6. Water Users' Association:

H6.1. Are you a member of a water users' association?	
Yes	1
No	2 →Skip to H7
Refused	89 → Skip to H7
Don't know	99 → Skip to H7

H6.2. Do you have a leadership position in a WUA?	
Yes	1 →Skip to H6.4
No	2
Refused	89
Don't know	99
H6.3. Have you ever had a leadership position in a WUA?	
Yes	1
No	2
Refused	89
Don't know	99
H6.4. How much input do you have in making decisions in the WUA?	
No input	1
Input into some decisions	2
Input into most decisions	3
Input into all decisions	4
Refused	89
Don't know	99
H6.5. How often does the WUA meet?	
At least once every two weeks	1
At least once a month	2
Less than once a month	3
Refused	89
Don't know	99
H6.6. Out of the last 5 meetings, how many did you attend?	
Enter number, must be ≤ 5	
Refused	89
Don't know	99
H6.7. Have you (or your HH) paid your WUA membership fees for the current period?	
Yes	1
No	2
Refused	89
Don't know	99
H6.8. Have you (or your HH) paid your irrigation fees for the current period?	
Yes	1
No	2
Refused	89
Don't know	99

H 7. Please rate the degree to which you disagree or agree with the following statements on 5 point scale where 1= "strongly disagree", 3="neither disagree nor agree," and 5= "strongly agree."

	Strongly disagree	Somewhat disagree	Neither agree, nor disagree	Somewhat agree	Strongly agree	Refused	Don't know
H7.1. There is a real advantage to my farm business to being part of a WUA.	1	2	3	4	5	89	99
H7.2. The WUA management is transparent.	1	2	3	4	5	89	99
H7.3. The WUA is really active in organizing and working with farmers.	1	2	3	4	5	89	99
H7.4. Farmers in this area cooperate well.	1	2	3	4	5	89	99
H7.5. The WUA is set up by local leaders to make profit.	1	2	3	4	5	89	99

H 8. Please evaluate the operation of the WUA in your area (village) in the listed aspects on 5 point scale, where 1= "very poor", 3= "satisfactory," and 5 = "very good."

	Very poor	Poor	Satisfactory	Good	Very good	Not applicable (no WUA)	Refused	Don't know/too early to evaluate	Don't know/other reason
H8.1. Adequacy and fairness of irrigation water distribution	1	2	3	4	5	0	89	00	99
H8.2. Irrigation system operations, maintenance, and repairs	1	2	3	4	5	0	89	00	99
H8.3. Collection of irrigation water charges	1	2	3	4	5	0	89	00	99
H8.4. Defense of WUA members' interests	1	2	3	4	5	0	89	00	99

I. CREDIT

I 1. Have you or someone else from your farm applied for a loan to finance the farm's operations from a bank, a savings and credit association, or a government or donor sponsored credit program, in the <u>past 2 years</u> (since December of 2010)?

Yes	1	***Continue***
No	2	***Skip to I12***
Refused	89	
Don't know	99	

I 2. Have any of these loan applications been approved?

Yes, at least one was approved	1	***Continue***
No, none were approved and none are pending	2	***Skip to I11***
At least one is pending but none were approved	3	
Refused	89	
Don't know	99	

For each of the loans approved during the last 2 years, please tell us:

	Loan 1	Loan 2	Loan 3
I 3. What was the purpose of the loan? What was the loan for? ***[mark all that apply]***			
Purchasing land	1	1	1
Purchasing inputs (for example, fertilizer/pesticides/improved seeds)	2	2	2
Paying for irrigation water	3	3	3
Introducing new crops	4	4	4
Purchasing livestock	5	5	5
Purchasing irrigation equipment	6	6	6
Purchasing other farm equipment (for example, a tractor)	7	7	7
Improvements to existing buildings or infrastructure	8	8	8
Constructing greenhouse	9	9	9
Constructing new buildings or infrastructure for post-harvest activities (e.g., cold storage, packaging, sorting, etc.)	10	10	10
Constructing new buildings or infrastructure for other purposes	11	11	11
Refinancing/covering other loans or debts	12	12	12
Other	13	13	13
Refused	89	89	89
Don't know	99	99	99
I 4. What was the source of credit? ***[choose one]***			
RISP	1	1	1
IFAD credit line	2	2	2
Millennium Challenge Account-Moldova credit line or Access to Agricultural Finance (AAF) activity	3	3	3
Other donor credit line	4	4	4
Private or commercial bank's own resources	5	5	5
Micro-credit organization	6	6	6
Saving and Credit Association	7	7	7
Other (specify) _ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _
Refused	89	89	89
Don't know	99	99	99
I 5. When was the loan approved?			
Enter MM /YYYY	_ _ / _ _ _ _	_ _ / _ _ _ _	_ _ / _ _ _ _
Refused	89	89	89
Don't know	99	99	99
I 6. What was the currency of the loan?			
EURO	1	1	1
MDL	2	2	2

	Loan 1	Loan 2	Loan 3
USD	3	3	3
Refused	89	89	89
Don't know	99	99	99
I 7. What was the initial size of loan? ***[use the same currency as in I9]***			
Enter amount	_ _ _ _	_ _ _ _	_ _ _ _
Refused	89	89	89
Don't know	99	99	99
I 8. What was the assessed value of collateral? ***[use the same currency as in I9]***			
Enter amount	_ _ _ _	_ _ _ _	_ _ _ _
Refused	89	89	89
Don't know	99	99	99
I 9. What was the term of loan?			
Enter number of months			
Refused	89	89	89
Don't know	99	99	99
I 10. What was the interest rate of the loan?			
Enter interest rate / percent	_ _, _ _ %	_ _, _ _ %	_ _, _ _ %
Refused	89	89	89
Don't know	99	99	99

I 11. If you or someone else from your farm applied for a loan to finance the farm's operations in the past 2 years (since December of 2010) and were/was rejected, what do you think was the main reason for rejection? ***[select only one]***

No applications were rejected	0	***Skip to section Last page***
Poor business plan or inability to demonstrate income	1	
Insufficient collateral	2	
Discrimination against farmers/people like me/us	3	
Bad credit history	4	
Repayment too risky	5	
I/we do not have crop insurance	6	
The loan I/we applied for was too small to interest the lender	7	
Other (specify) _ _ _ _ _ _ _ _ _ _ _ _ _		
Refused	89	
Don't know	99	

I 12. What was the main reason for not applying? ***[select only one]***

Did not think I/we would qualify for a loan due to insufficient collateral	1
Did not think I/we would qualify for a loan due to credit history	2
Did not think I/we would qualify for a loan for other reasons	3
The terms of loans available are unfavorable to me/us	4
Afraid I/we would not be able to pay back the loan/ did not wish to get into debt/too risky to take on debt	5
I/we did not know of available loans in my areas/not sure of application process	6
I/we were able to borrow what was needed from family/friends	7
I/we did not need a loan	8
Other (specify) _____	
Refused	89
Don't know	99

Questionnaire #

Explain the respondent that this is a longitudinal survey and that we will probably need to contact him / her in the future for participation. Tell that the names and contact information will be kept confidential and will not be disclosed to the third party.

Reenter farm operator code	

			Respondent	Training attendee (if applicable)	Alternative contact person	
1	**Name / Surname**					
2	**Relation to respondent**				**Family member/Relative**	**1**
					Friend	**2**
					Neighbor	**3**
					Other	**4**
3	**Telephone number**					
4	**Alternative telephone number**					
5	**Address**	**CIS area (for ISRA/CISRA)**				
		Region				
		Raion				
		Primaria				
		Settlement (village / town)				
		Detailed address				

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