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KOSOVO NEW OPPORTUNITIES FOR AGRICULTURE PROGRAM

STRAWBERRY PRODUCTION, HARVEST AND
POSTHARVEST HANDLING TECHNICAL ASSISTANCE



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KOSOVO NEW OPPORTUNITIES FOR AGRICULTURE PROGRAM

STRAWBERRY PRODUCTION, HARVEST AND
POSTHARVEST HANDLING TECHNICAL
ASSISTANCE

JULY 2012

DISCLAIMER

This report was prepared by the New Opportunities for Agriculture project team of Tetra Tech ARD based on a Final Report prepared by Short Term Technical Advisor, Surendra Dara, a Farmer to Farmer volunteer. The authors' views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

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BACKGROUND

USAID supports economic growth in Kosovo through programs that strengthen and improve competitiveness of Kosovo agribusinesses, improve the business environment, and encourage local economic development. Accordingly, USAID/Kosovo has awarded Tetra Tech ARD the task order for the New Opportunities in Agriculture in Kosovo Program.

The goal of the program is to increase economic growth in Kosovo through expanded, environmentally sustainable production and sales of value-added agricultural products by enabling producers and processors to compete regionally and globally. The program has the following components:

1. Products and farmers linked with markets;
2. Agriculture products diversified and increased;
3. Food quality and safety improved;
4. Increased affordable and accessible credits;
5. Improved coordination within the agriculture sector.

The strawberry industry is in a nascent stage in Kosovo with great potential to expand and improve. Strawberries are currently grown in small acreages in about 130 ha. Based on the personal communication with growers, about 50 tons/ha are produced during the three or so years of the crop cycle. With the help of New Opportunities for Agriculture and Initiative for Agricultural Development in Kosovo, a few growers are experimenting with a short-day cultivar, Honeoye and a day-neutral cultivar, Albion for fruit production. Honeoye is also currently being evaluated for nursery production by two nurserymen in Kosovo within the NOA program.

Strawberries require specific environmental conditions for optimal growth and production. They are very sensitive to high temperatures or extended photoperiods, which are characteristic of summers in Kosovo. As such, thorough knowledge of the strawberry plants, understanding of various varieties and their interaction with the environment, as well as specific production practices are all essential for the Kosovo growers to develop the strawberry industry.

It is to be noted that strawberry production on the California Central Coast evolved over decades of refining the nursery and fruit production techniques in relation to the local agroclimatic conditions. Kosovo farmers can use these refining techniques and learned knowledge to modify certain practices and adapt strawberry production to their local conditions.

PURPOSE OF ASSIGNMENT

The purpose of this assignment is to provide technical assistance and training to Kosovar strawberry farmers on topics of production, harvesting, and postharvest handling of the crop. Furthermore, the assignment is to provide assistance on nursery production of strawberry transplants and on developing the strawberry industry.

Just like any other developing industry, the strawberry industry in Kosovo needs the technology necessary for it to establish and grow. The knowledge of growing nursery plants and production fields is critical to realize potential yields and good quality strawberries. It is also important to have a well-trained group of progressive farmers who will be the leaders of this industry. California is the largest producer of the best quality strawberries because of the multidimensional support from the growers, industry partners, universities, and other entities in research and outreach. A similar structure is necessary for Kosovo strawberry industry to grow.

The training conducted during this assignment introduced various aspects of the strawberry production chain, from nursery plants to postharvest handling and even to marketing of strawberries. The audience was Kosovar farmers. Awareness is now there to realize how the transplants are produced, why they require specific chilling temperatures, how they are planted in production fields, how the land is prepared, water and fertilizers are applied, and fruit is harvested and shipped. They are also aware of various components of IPM and the opportunities to adapt them for their local conditions.

EXECUTIVE SUMMARY

This assignment was created to provide the developing strawberry industry in Kosovo with an introduction as to best strawberry production practices and necessary training and consultation. Trainings and consultations provided during this assignment will help the farmers to move in the right direction for the growth of the industry. Kosovar strawberry farmers are generally enthusiastic and educated enough to understand the technology suggested to them. Recommendations embedded within this report will help them to expand the production period and improve the yield and quality of the berries, and to produce good quality transplants.

Multiple field visits to look at the nurseries and production fields that were planted in two experimental varieties were made. The condition of the fields varied in response to the care provided by the farmers.

A field day was conducted and was well attended by enthusiastic farmers. However, fewer farmers attended the follow up workshop which was more critical for them to gain the required knowledge. If the FtF volunteer's presentation and manual are translated and growers go through the contents thoroughly, it will compensate for the absence of some of them at the workshop and also serve as a guide for all of them. It should be remembered that these are only guidelines, and farmers must fine tune the practices as appropriate given local conditions.

The strawberry industry certainly has good potential for growth within Kosovo.

FIELD ACTIVITIES TO ACHIEVE PURPOSES

Open field and high tunnel strawberry operations of Rexhep Spahiu and Mehdi Bresilla in Llugaxhi, Lipjan were visited on July 10. Albion and honeoye varieties were planted in these fields, but the plants looked a little stressed for water.

On July 11, a field owned by Halim Bafitu in Davidovc, Shtimje and a nursery owned by Skender Ramadani in Godanc, Shtimje were both visited. The main field looked very good and well maintained and within-row spacing was appropriate, but between-row spacing of 20-22 inches seemed excessive. A good configuration for uniformity or increasing the bed width for planting a third row was recommended. It was observed that the nursery field needs more irrigation and care as it has just started to produce runners. The owners are expecting 20 runners per plant and between 20-30 runners per plant are needed for an increased block. With proper care and cooperative environmental conditions, more runners can also be produced.

Also a few fields in Zhegra, Gilan were visited. Both fields need more irrigation. Growers seemed to conserve water for other crops such as tomatoes because they were currently bearing fruit. They were advised that good plant health of strawberries is very important even during the non-bearing first year in order to realize good yields within the next year. Lumnije Bislimi's Honeoye plants were severely water stressed and heavily weed infested. It was advised that a focus be put on weed removal and watering. Zeqir Jahiju's field is slightly better with some recent weeding, but needs more care: weeding, watering, and nutrition.

Xhavit Mulaj's nursery in Llukë, Decan was visited on July 12. Nursery appeared to be well irrigated and fairly well maintained. He said that he was irrigating every five days either with sprinklers or flooding with river water. There were a few weeds which he would soon be removing. Runners were also forming and growing well. He just needed to train them for a good spread and growth. A good number of runners can be expected from this nursery if the care continues.

On July 13, Llausha was visited for a field day organized by Initiative for Agricultural Development of Kosovo. During the visit the field was inspected, and a short introductory talk about strawberry cultivation was held. It was attended by about 35 people. Their fields were well maintained except that there was some early damage to Honeoye probably from sunburn. Hetem Balaj and Selim Balaj seemed to be progressive growers and their older fields were displayed. These fields are being used to experiment on plants to produce runners for extra transplants.

The workshop titled Strawberry Production Technologies was conducted on July 16, which was attended by 17 farmers. They were given a strong overview of strawberry production and postharvest handling practices, all questions were answered about irrigation, nutrition, pruning, harvesting, and postharvest handling issues. A manual focusing on strawberry production and postharvest handling of strawberries was prepared and will be translated into Albanian.

TASK FINDINGS AND RECOMMENDATIONS

Task in Scope of Work (SOW):

1. Assess berry production, harvest, and postharvest in Kosovo in terms of its scale and potential for growth.

Recommendations regarding #1:

- a. Strawberry cultivation is technologically advanced and a thorough knowledge of the production techniques is very important. The FtF volunteer provided as much information as possible through the workshop, but not many people attended. The FtF volunteer recommended that they need to build up the knowledge first, experiment with various practices, and then make appropriate changes to suit the local conditions. Right from the selection of varieties to postharvest handling of berries, specific practices account for improving the yield and quality at each and every step. Growers need to work on all these aspects. The manual provided, once translated, will help the farmers as a quick reference.
- b. The FtF volunteer put together a list of early, early mid, mid, late mid, and late season short-day varieties and everbearing or day-neutral varieties for the Kosovo growers (see annex I). He also compared monthly temperature trends in Kosovo with those in similar strawberry growing areas in the US but could not get that information for Kosovo so an educated guess was made and a list of varieties was developed based on those grown in Dakotas, New York, and Virginia states in the US.
- c. Conduct a study evaluating various cultivars and different production practices to identify avenues to expand the production season (see annex II).
- d. Seriously commit to improving sanitary conditions in the field during production, harvesting, and postharvest handling for improved food safety and fruit quality.
- e. Farmers should work collectively on gaining and exchanging strawberry production technologies, acquiring and using equipment, and strengthening the industry.
- f. Follow IPM practices as much as possible. Kosovo farmers seemed to need a little more understanding of IPM. They could refer to the manual provided by the FtF volunteer for an overview.

Task in SOW:

2. Assist a trader that the NOA is working with on a trial shipment of strawberries to Albania by focusing on cooling and packaging materials.

Recommendations: N/A

Task in SOW:

3. Provide one-on-one technical assistance to a local nursery on plant multiplication.

Recommendations to #3:

- a. Better care of the plants with proper irrigation and fertilization and proper spacing the runners will increase the number of transplants produced.
- b. Maintain good health of the runners to produce disease and pest-free transplants.
- c. Do not sell transplants that are infected with diseases or infested with pests as this will have a major impact on field production. Some diseases and pests are difficult to manage if they spread out to larger areas.

CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE ACTIVITY

Kosovo has a good potential for the strawberry industry to grow primarily because it is an underdeveloped sector. There seems to be demand for good strawberries in Kosovo and that is also an indication for future growth. However, strawberry cultivation requires specific knowledge and the growers need to work on building the knowledge base individually and collectively as a group for the growth and promotion of the industry.

If farmers use the training provided and follow the recommendations provided for every stage of the production and postharvest handling, it is fair to expect that there will be a significant improvement in the yield and quality of strawberries. Farmers need to evaluate various cultivation practices and eventually design a system that is ideal for strawberries in Kosovo climate. Exploring cooler or high altitude areas for growing strawberries and nursery plant propagation is something to consider.

A follow up visit to evaluate the progress and additional planning for the future is recommended.

ANNEX I: STRAWBERRY VARIETIES

Early	Early Mid	Mid	Late Mid	Late	Everbearing	Day-neutral
Annapolis	Brunswick	Cabot	Clancey	Lateglow	Ft. Laramie	Albion
Earliglow	Darselect	Cavendish	Jewel	Winona	Ogallala	Seascape
Mohawk	Glooscap	Kent		Sparkle	Ozark Beauty	Selva
Northeaster	Honeoye	L'Amour				Tribute
Sable	Redchief	Mira				Tristar
Veestar		Seneca				

These are the varieties grown in Dakotas, New York, and Virginia along with a couple of popular day-neutral varieties grown in California.

ANNEX II: STRAWBERRY VARIETY STUDY

Agro-climatic zones: 3-4

Varieties: 15-20 Types: Early-bearing and day-neutral

Production: Open-field and tunnel (To evaluate early production)

Pruning: Normal and pruned (To evaluate prolonged production)

Replications: 4

Area: 0.5 ha or 25,000 plants for 20 varieties or 1250 plants/variety

For each variety open-field and tunnel production systems will be compared with and without pruning after the peak production in summer. Both day-neutral and early-bearing varieties will be included in the study and treatments will be replicated four times. This study will be conducted in different agro-climatic zones.

Open-field	Tunnel
Pruned 75 plants	Pruned 75 plants
Open-field	Tunnel
Normal 75 plants	Normal 75 plants

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