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KOSOVO NEW OPPORTUNITIES FOR AGRICULTURE PROGRAM

ASPARAGUS PRODUCTION TECHNICAL ASSISTANCE

JULY 2013
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Implemented by:

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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, John Casazza, 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.

Asparagus fits the profile and goals of the program. It is a crop that offers an opportunity to diversify the current production scheme in Kosovo, bring in a new crop that has potential for the domestic as well as the export markets and it's a safe and healthy food additive to the population's diet. Planting asparagus will bring Kosovo in line with sixty-two other countries around the world that cultivate it. Even such neighbors as Macedonia and Greece produce asparagus so opportunities abound for the expansion and proliferation of the region's crop.

The group has thought out the introduction of the new crop very well. Three top quality selections of asparagus varieties are included in the mix. Each offers unique characteristics and will be tested in the Kosovo environment to see how they perform. The decision to limit the nursery production to 30,000 seedlings each and then transplant one hectare per grower is adequate to get a good idea of how the crop will grow out before expanding the following year to greater area. It also allows the producers to test different techniques for fertilization, irrigation, and weed, pest and disease control. Farm sizes tend to be around five to ten hectares with production diversified to hedge against crop failures, market fluctuations and other risk factors. Including asparagus in the mix brings in a high cost but high a value crop with a lot of potential for good economic success.

Asparagus is generally suited to Mediterranean types of climates but farmers around the world have adapted the crop to fit their own particular environment. Kosovo farmers have an advantage in that the regional climate is more similar to the Mediterranean climate but cooler thus driving the asparagus production towards the end of the regional season.

Knowledge of asparagus production is widespread around the world and the team at New Opportunities in Agriculture in Kosovo is increasing their knowledge and understanding of the crop and the agriculture operations processes. My role as an FtF volunteer was to assess the group's current level of understanding and capabilities and provide information and ideas on how to proceed efficiently while achieving maximum productivity.

PURPOSE OF ASSIGNMENT

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EXECUTIVE SUMMARY

The New Opportunities for Agriculture's asparagus program has worked with three greenhouse nurseries to successfully produce approximately ninety thousand (90,000) asparagus crowns to be able to plant out to an area of three (3.0) hectares in the spring and summer of 2012. The group has identified six growing sites around the country with sandy loam to clay loam soils, in which to plant the first crop.

The suitability of asparagus to the Kosovo's climate comes into question again especially after the 2012 heavy winter with accumulations of up to four feet of snow on the ground throughout the country. The other concern relates to the multiple rain days during the spring within the prime harvest period of asparagus.

The technical support group of the New Opportunities for Agriculture program is gaining considerable knowledge about asparagus as a crop and about the production practices. The project is at a critical juncture in its progress. There are sufficient amounts of crowns for planting and the growers are highly motivated and interested in planting as soon as possible. But there have been delays, mostly due to the rainy weather, that have pushed back the initial land preparations and weed control operations and the installation of the drip irrigation systems. The longer the delays, the less time the plants are able to grow foliage for the development of the crown prior to the winter dormancy.

Out of the six selected sites for asparagus production, two were visited. After receiving the soil analysis for all six sites, it was determined that all sites meet the criteria for suitable soil texture: two sites with sandy loam soils, two sites with loam soils and two sites with clay loam soils. Drainage at the two sites that were visited had no standing water despite having received daily rains. A site with clay loam soils was not visited, but it is noted that those sites do have more water retention than the sandy loam or loam soils.

Three nurseries were contracted by Kosovo NOA to grow asparagus seedlings. The seedlings were in plastic bags having been transplanted in October 2011. The seedlings are in excellent condition with adequate size, swelling buds and clean and healthy roots. The crowns are ready to plant except they will need to be hardened off before field planting. It is recommended that the seedlings be hardened off and kept at the nurseries and transported to the field once the area is ready to plant.

Aside from the nurseries and field sites, a local agriculture material supplier was also visited. The amount of materials available that are approved for asparagus are limited. The drip irrigation supplies are in good supply with the Euro Drip brand hose and accessories the better quality. Fertilizer materials are limited but sources of soluble fertilizers for drip irrigation injection are available.

A training session was conducted on asparagus crown planting at the farm of Hivzi Aliu. Fortunately, the day prior to the field activity and the day of the training were sunny. The soil dried out enough to be able to get a tractor into the field and rotovate and form the planting furrow. There were eleven (11) grower participants in the training and Ismet Babaj assisted the training. The training exercise was recorded for replay on local television.

FIELD ACTIVITIES TO ACHIEVE PURPOSES

While in Kosovo, the NOA team participated in the weekly staff meeting where Ismet Babaj presented on the asparagus project and its achievements. Ismet demonstrated the greenhouse asparagus crown production, the current situation with the areas to be planted to asparagus in 2012 and the plans for asparagus for the outgoing years. Food is important in the Kosovo culture and people are unfamiliar with the preparation and use of asparagus. Ismet presented various photos of asparagus dishes in closing his presentation.

Three nurseries were visited.
The first nursery is Las Pallmas owned by Luan Buqaj in Lipjan. The crowns were still in bags and inside the plastic house. The size of the crown was small but suitable in size for planting, clean with good root growth.

The nursery of Skender Ramadani, Fidanishta E Godancit in Godance was also visited. The crowns were bigger than in the first nursery and also clean with good root growth. The bagged crowns were already outside of the plastic house and hardening off under natural conditions, which is the best situation at this time for the crowns. They are ready for planting as soon as the fields are available. This should be the protocol for the other nurseries as long as the crowns are maintained with irrigation and fertilizer and are kept in well drained areas.

The crowns at the Agroserra Nursery in Mitrovicë owned by Gani Hazeri, were in the best condition and were larger, with thick clean roots and swelling fern buds.

Next year's plans are to plant the seeds in trays and transplant them directly into the field. This is the traditional method used in commercial asparagus production and is less expensive than nursery bag plantings. This method is riskier than planting the seedlings in nursery bags because of the variability of the soils and the variability in outdoor growing conditions. Care must be taken to plant the seedlings in beds to promote good drainage and maintain the plants with good drainage, fertilized and irrigated. The size of the crowns will vary, which is different than having the crowns come out of the nursery bags.

Three agriculture material supply stores were visited.
The first store, Kalia Garden Center near Lypjan, has two nearby outlets and is a minor supplier of materials for commercial agriculture and mostly supplies the home consumer. However, they had some agriculture grade materials such as Glyphosate based herbicides that are registered for use on asparagus in the USA, and another herbicide named Furore, which is not registered in the USA for asparagus. The limited pesticides included Decis synthectic pyrithroids that could be used on asparagus beetle in Kosovo when registered, according to the PERSUAP. They also carried Previcur, Antracol and Consento fungicides for vegetables, none of which are approved for asparagus. For fertilizers there was KAN 27% N and Linzer 15-15-15. In the second outlet they had a prohibited herbicide containing 2,4–D called Mustang manufactured by Karsai. There were also some additional granular fertilizers, 9-15-15 with 20% SO3 and 5-24-16 with 6% SO3.

The next supplier we visited was Isak Begisholli of Fitofarma in Ferizaj. This store has more materials that could be used in commercial agriculture including a complete supply of

Eurodrip irrigation supplies. In terms of fungicides, there was Mancozeb and Chlorothalonil based products, both of these including Sulfur Dust are registered in the Kosovo PERSUAP for control of Asparagus Rust (Puccinia asparagi). These fungicides including Myclobutanil are registered in the USA for Cercospora Leaf Spot (Cercospora asparagi). Mancozeb is registered in the USA for Fusarium Wilt or Crown Rot (Fusarium oxysporum and Fusarium monilforme). Kosovo PERSUAP states use of fungicides is not recommended for control of Fusarium Wilt even though Mancozeb is available. Fuarium wilt was present in asparagus fields in Macedonia when we visited last year. Mefanoxam and Fosetyl-AL are registered in the USA for Phytopthora Crown & Spear Rot (Phytopthora megasperma). Nothing of this pathogen is mentioned in Kosovo PERSUAP.

The last supplier we visited was Elgen Bokshi of Jonathan – Agriculture Pharmacy in Gjakova. He had a small supply of agriculture chemicals, materials similar to the other stores we visited. He was also a supplier of Siplast drip irrigation equipment manufactured in Italy. It didn't appear to be as good a quality of drip tube compared to the Eurodrip and the inventory of materials was less than that of Fitopharma. He carried a large inventory of flower and vegetable seeds, from what appeared to be from medium to high quality seeds.

Hivzi Alija's farm was visited, in Livoq Village. He has agreed to plant one hectare of asparagus out of his six hectare farm. We toured the field which at the time was planted with green manure livestock feed of wheat and peas. They were trying the day before to get into the field to cut the green manure but with the constant rains, tractors couldn't enter without damaging the structure and compacting the soil. The sandy loam soil was draining well but was wet and needed at least two dry weather days to be able to prepare the field. We were told that forty tons of composted cattle manure was applied to the one hectare field. The wheat and peas looked very healthy, dark green and uniform in size. Based on all of these observations, it was determined that this would be a good field to plant asparagus.

This farm has two tractors - one is around 55 horsepower that is used for planting and cultivating and the other is close to 100 horsepower that is used generally for land preparation and forage cutting. Both tractors are somewhat light for the land prep function but with the light soils and good soil structure these should be adequate for the asparagus planting. The implements for the tractors that could be used in the asparagus operations include a reversible moldboard plow, a small disc harrow, a rotating head rotovator, a small three shank cultivator or furrower, and a motorized manual rotovator. The steps for land preparation, drip hose installation, and planting with the equipment available include a deep plowing, discing or rotavating, furrowing, drip tube installation and covering and planting.

It is important to note that the dairy is within one hundred meters of the field and the manure discharge from the barn forms an open pool that in a heavy rain could flow over to the asparagus field. The well head in the dairy and the field is unprotected and the opening and shaft is exposed. These are easy to address and the owner is aware they need to be addressed in time.

Setting up the training session

On Thursday, May 24, we visited Agroserra Nursery in Mitrovicë to show Mike the quality of the asparagus crowns and what the plan was to transport the crowns to the planting field in Peja. We also visited a field being considered for asparagus planting that is owned by Esat Hajzeri located in Vinarcë, Mitrovicë. The farm was disced and supposedly applied with glyphosate herbicide. There were some weeds returning which could easily be controlled in

the land preparation cycle. The soils were sandly loam with some pebbles and small stones in one section nearest to the river, all in all suitable for asparagus. Mike Kimes and I have portable GPS units and I wanted to show him the features of calculating the area within a perimeter. Mike and I walked the field perimeter and came back with an area of four tenths (0.4) of a hectare, about twenty percent (20%) less than estimated on grower list.

On Tuesday, May 29, we returned to Hivzi Alija's farm in Leshan, Peja, with Mike and Ismet. We were interested in seeing the condition of the soil in preparation for the training that we wanted to conduct. Unfortunately, it rained and hailed setting back the plans to start the land preparation. Ismet Babaj worked on arranging the transportation of the seedlings from the nursery in Mitrovicë to the farm in Peja. We discussed the process for conducting the training and the number of beneficiaries that would be attending. I measured the field with the GPS and discovered the field was actually one (1) hectare in area compared to the one point two (1.2) hectares originally estimated. The truckload of seedlings arrived late in the afternoon. They were offloaded and set in a shady area near to the planting field. We instructed Zegir Alija to make sure to keep the seedlings moist and avoid letting them dry out. It was still two days away from the training.

On Wednesday, May 30, Ismet and I returned to Hivzi Alija's farm in Leshan, Peja. Fortunately there was no rain that day and Zegir Alija hooked up the rotovator and attempted to work the soil. He made some progress in loosening about ten (10) to fifteen (15) centimeters of the topsoil but it was apparent that the soil was still too wet and the finish of the discing left some of the soil in clods. Things were set for the following day's training.

Thursday, May 31, Ismet and I traveled early to Hivzi Alija's farm in Leshan, Peja to set up the training exercise. I had already completed an outline of the training and Ismet had givien the beneficiaries a copy of the asparagus manual I wrote on my last trip to Kosovo in September 2011, and translated into Albanian. When we arrived, we noticed he soil had dried sufficiently to be able to work it with the rotovator. The machine cleared an area of about five hundred (500) square meters. Later we hooked up the three shank cultivator, took off one of the shanks and set the other two to approximately one hundred forty five (145) centimeters. The tractor with the implement attached was able to get into the field and make furrows about twenty (20) centimeters deep and at the row-to-row spacing of the shanks. Ideally, we wanted a distance of one hundred fifty (150) centimeters to be able to establish a clearance for the tractor wheels that would continue to work the beds to cultivate, weed and reform the beds. Actually five (5) centimeters difference is still adequate to accomplish the tractor work. Also, because of the smaller area to be planted and with still the same number of crowns, we decided to plant the crowns at a spacing of twenty-five (25) centimeters giving the area planted a density of twenty-seven thousand (27,000) per hectare instead of the twenty-two thousand (22,000) originally estimated.

Conducting the training session

We conducted the training with nine potential asparagus farmers and the two nursery operators. I wrote a guideline for the training exercise based on the asparagus manual – it was important for the growers to experience the actual planting because they would be teaching their employees how to do the planting in their fields. I started with the group seated in a meeting area and made a brief introduction of the plant, the growth of the crowns and the condition of the crowns at planting, the importance of timing of planting, and the placement and spacing of the crowns. After covering soils, site selection, and variety selection, we went out to the field and I explained the land preparation sequence. We had already placed the drip

tube in the field but we explained how it was supposed to be positioned in relation to the crown placement. I also explained the fundamentals of drip irrigation function, watering principals and maintenance of the dripper lines over the crop cycle. I recommended to Mike and Ismet that the supplier conducts a separate training on drip irrigation once the systems were installed and operating. I discussed the pre-plant fertilizer application even though we decided not to use fertilizer in the demonstration. Our original plan was to broadcast about eight hundred (800) kilograms of 15-15-15 fertilizer and incorporate the material in the land preparation. However, the land preparation was met with wet soils so the group was not able to apply the fertilizer. Ismet continued to talk about the crowns, the placement of the crowns and the covering. Each grower planted a crown and Ismet continued to explain the process, the function of the depth of crowns and the sequence for the commercial harvest over the next two years of growth. The whole process was filmed and interviews of the principle activists questioned on the crop, the market, and the use of asparagus.

One of the interesting aspects of the training and the inquiries of the participants had to do with the use and preparation of asparagus. This is a new crop in Kosovo and many growers, unless they've been outside of the country, had never seen asparagus before. They were interested in knowing how to prepare and use the vegetable. Some of the growers brought magazines with recipes for preparing asparagus. Others talked about the health aspects of asparagus. Ismet and I described all of this because the growers had to understand what was going to drive the demand for asparagus in the future. If they were going into asparagus production in the future, who in Kosovo was going to buy it? I believe some of the growers even clipped the sprouting asparagus shoots and ate them to be able to sense the taste of the vegetable. The training went well and the growers expressed their understanding of the crop, the process for planting and why the crop was so important a vegetable around the world.

TASK FINDINGS AND RECOMMENDATIONS

The following tasks were derived from the Scope of Work provided by CNFA/USAID's Farmer-to-Farmer Program and from conversations with NOA staff working on the project.

Task #1 – One day training on growing asparagus and basic Kosovo asparagus cultural practices for green asparagus. The training should include a planting guide, fertilization and irrigation, IPM training, recommended herbicides for weed control and asparagus best practices.

Task # 2 – Site selection of future asparagus open field production for transplanting from greenhouse to open field for spring of 2013 and recommendation for planting.

Task #3 – Report using Program Format and recommendations or road map for next steps.

Task Findings

Task #1 – I conducted training on growing asparagus and on some of the basic Kosovo asparagus cultural practices for green asparagus. The growers were given the Asparagus Production Manual for Kosovo Asparagus translated into Albania as the reference for the training. I accompanied it with a Kosovo Green Asparagus Field Training outline that I used as a training guide. A copy is attached in the annex section. I did not provide field training on fertilization, IPM pest control, irrigation nor on herbicide practices as equipment for spray was not available and irrigation installation was not complete but the sections in the manual cover each subject thoroughly.

Task #2 – Due to the delays in selecting the training site and viewing current fields for asparagus production we were not able to preview fields for 2013 plantings.

CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE ACTIVITY

1. Now that the nursery production of seedlings is going well, the group has to concentrate on site selection. We've already spoken of the soil and topography and the planting and layout, but other considerations are necessary to discuss. One of these is the packing and cold chain requirements. Given the limited area of soils with light textures throughout the country, I recommend that the group look for planting sites within the Peja municipality along the river terraces where more of the same light soils are available. Also, looking forward I recommend that the group consider planting up to fifty (50) hectares within the Peja area spreading out the planting to as few growers as possible. This will provide a packing plant with enough production to keep one to two lines operational. According to Mark Wood, incoming Chief of Party for Kosovo NOA, a multi-product packing plant will be constructed in Peja in a new phase of the project. The plant should include hydro-cooling and cold storage to store asparagus at the proper temperatures for longest shelf life. This fits with the recommendation to consolidate asparagus areas in the Peja region and plant up to fifty (50) hectares of asparagus by the year 2014.

2. The group needs to develop systems including equipment, irrigation, planting material, crop maintenance and agriculture inputs and process documentation to meet annual planting targets. The Kosovo growing season is limited, especially due to late winters and seasonal rains throughout the spring harvesting and planting periods. The group of growers needs to have equipment in place, irrigation installed and land prepped to be able to plant the areas in early spring for full summer growth. The same is critical for the nursery plantings of asparagus seedlings so that they can get to the field with enough time to produce crowns for the following planting season.

3. The group plans to transfer the seedling sprouted in trays to the open field for the 2012 – 2013 season. I recommend taking a look at planting the seedlings out to the plastic bags as in 2011 – 2012 and keeping them in the greenhouse for grow out and planting in 2013. The quality of the seedlings is excellent. They are big, uniform in size, clean and disease free. Transplanting to the open field will not gain the same results in terms of uniformity, quality of the crowns crown recovery and ease in transportation and post coming out of the ground versus coming from a planting bag. The advantage in planting to the open field is the ability to handle large volumes of crowns in a small area and possibly in the cost of production.

4. Work with the agriculture material suppliers in the country to bring in products specially for asparagus production, including the fertilizers, fungicides, herbicides and pesticides recommended and approved for asparagus in the USA and other parts of the world. Work with the Kosovo PERSUAP to approve more agriculture chemicals suitable for controlling disease and weeds in asparagus.

5. Start developing a financial model based on seedling costs, land preparation and planting costs which are included in the activities that are being started in this year or

coming up in the following year. Add weed control and fertilizer requirements, and pest and disease control as they come about. Eventually harvesting and packing will become part of the cost mix as well as fixed costs of supervision, capital depreciation and any costs associated with maintaining or paying for the land. Teach the farmers on how to maintain records of field activities and costs.

6. Develop a soils and tissue standards for asparagus and work with the local laboratories at the institutes and universities to assist the group and train the farmers and the technicians to interpret the results and develop fertilizer rates to match the requirements.

7. Start a cultivar trial and variety bank of asparagus cultivars from different locations. Keep records of the production, quality and marketability of the product for future reference and future expansion. The trial could be set up at a local university or at the Peja research laboratory to give it academic as well as commercial significance. The variety bank should include material form the cooler climates of Europe and North America. This could also be used as a model farm to provide the growers with techniques for modern asparagus production.

8. Investigate possible marketing channels including exports, potentially aligned with the Macedonian producers and for local markets through supermarkets or through the wholesale market. There is potential even with the low production. Not knowing the production cycles yet, there may be an overlap or an extension of the Macedonian season and a good opportunity for Kosovo asparagus to market internationally. Also, having asparagus in the local market will stimulate demand and possibly open up opportunities for imports in the off season.

9. Start promoting the initiation of asparagus production in Kosovo. This is going to be a historic event, the first harvest of asparagus, and the beginning of a tradition bringing back asparagus to the origin and region of its commercialization in 200 BC.

ANNEXES

Annex 1 – Scope of Farmer to Farmer Program Kosovo Asparagus

Farmer – to – Farmer Program – Kosovo

New Opportunities for Agriculture

Scope of Work

Host Organization: ARD New Opportunities for Agriculture
Value Chain: Asparagus
Assignment Location: Pristina, Kosovo
Scope Developed By: Mike Kimes
Date of Submission: March 15, 2012

Assignment	Dates	Objectives
Asparagus	Arrives: 5/20/12 Preferred: 5/21/12 Departs 6/2/12	Provide technical assistance and training on nursery seedling and crown production with two nurseries producing 240,000 crowns for 8 hectares of planting in May, 2013. Provide technical assistance and training on open field planting for 90,000 crowns grown in 2011-2012 growing season for 3 hectares of new crop asparagus production.

Desired Qualifications of Volunteer

The Volunteer will have past experience in open field production of asparagus, including cultural practices, equipment machination operations, quality, planting programs, field layouts, planting techniques, IPM best practices, fertilizer programs and weed and disease control. The volunteer will be familiar with designing planting schedules in order to provide continuous harvest for lengthening the shipping season. He/she will have the know-how in asparagus crown planting, plant protection, mechanization, food safety and harvest practices.

Issue Description

The purpose of this proposed activity is the production and promotion of 240,000 asparagus seedlings and crowns in Kosovo, producing asparagus crowns for 8 hectares of asparagus for planting in spring 2013. Moreover, the Program will provide technical assistance and training in the open field planting of 3 hectares of asparagus crowns that were grown in greenhouse during the 2011-2012 growing season for the Programs growing grantees.

Program will implement the proposed greenhouse activity with two proven local nurseries that have the capacity to plant asparagus seeds, 120,000 seedlings and crowns in each

greenhouse and protected open fields for crown production and to produce high quality asparagus crowns using three hybrid varieties of asparagus seeds (UC 157, Depoli and Jersey Giant) for planting the following 2013 growing season.

The Program will also plant to permanent open field the 90,000 asparagus crowns that were grown by the Program in nurseries during the 2011-2012 growing season and provide the growing grantees the crowns and technical information and training for asparagus new crop production.

Desired Impacts

- Encourage production of domestically produced asparagus crowns
- Increased agricultural production and diversification of new crops for export
- Promote new crop asparagus with other potential actors who want to plant and export
- Increase knowledge and develop skills of local nurseries and growers to produce asparagus

Desired Impacts	Host Profile Verification Items
• Encourage production of domestically produced asparagus	240,000 asparagus seedlings produced Two nurseries encouraged on seedling and crown production 3 hectares of asparagus crowns planted from nurseries to open field from 2011-2012 crown production.
• Increased agricultural production and diversification	240,000 asparagus seedlings and crowns produced for 8 hectares, 2013 planting 90,000 crowns or 3 hectares of new crop asparagus planted in 2012.
• Promote new crops with other potential actors	At least 20 interested parties participate in training 4 potential producers identified
• Increase knowledge and develop skills of local nurseries and farmers to produce asparagus seedlings and crown production for open field production	Two nurseries trained on seedling production Practical training provided for nurseries, advisors, farmers, students, input dealers and other interested actors

Background Update

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 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:

6. Products and farmers linked with markets:
7. Agriculture products diversified and increased;
8. Food quality and safety improved;
9. Increased affordable and accessible credits;
10. Improved coordination with the agriculture sector.

Assignment Itinerary

Day	Activity
Day 1	Arrive in Kosovo briefing, introductions and orientation
Day 2	Field visits to nurseries
Day 3	List steps needed in the field for asparagus production and cultural practices for open field planting and prepare for training
Day 4	Practical training for open field planting field layout, equipment needs, fertilizer and water use, weed control, disease control and IPM training
Day 5	Transplanting supervision to open field
Day 6	Transplanting supervision to open field
Day 7	Transplanting supervision to open field
Day 8	New sites field visits for 2013 planting
Day 9	Prepared a list of action items needed to follow on asparagus activity
Day 10	Develop road map activities summaries for follow on year 2013
Day 11	Debriefing with USAID and Program – Final Report writing

Deliverables

1. One day training on growing asparagus and basic Kosovo asparagus cultural practices for green asparagus. The training should include a planting guide, fertilization and irrigation, IPM training, recommended herbicides for weed control and asparagus best practices.

2. Site selection of future asparagus open field production for transplantation from greenhouse to open field for spring of 2013 and recommendation for planting.

3. Final report using Program format and recommendations or road map for next steps.

Level of Effort

Eleven days not including travel. Starting assignment on Monday May 21 and ending on June 1, 2012 including working on one Saturday May 26, 2012.

Accommodations: Hotel Sirius

Recommended Preparation

If the volunteer can bring any contacts and pictures of operations, equipment needed for asparagus production, materials needed in the training to be given to the farmers.

Outreach

CNFA requests each volunteer complete at least 8 hours of outreach after returning from an assignment. This includes any conversations you have about your project, newspaper articles, presentations, or other events. Please keep this in mind during your project, and ensure that you are taking notes to correspond with photographs, meetings, or notable activities. Your Washington DC coordinator will follow up with you both during debriefing and again several months after your assignment is completed to get an update of your outreach efforts.

Project Contacts

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Annex 3 – Kosovo Green Asparagus Field Training Exercise

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OD AMERIČKOG NARODA

Kosovo Green Asparagus – New Grower's Primer
May 2012

John L. Casazza
JLC Consulting

Introduction

Now that the asparagus has been in the nursery for almost one year, it is ready to plant to the field at the commercial density and at the right depth and spacing. The seedlings coming from the three nurseries; Las Pallmas from Luan Buqaj in Lipjan, Fidanishta E Godancit from Skender Ramadani in Godance, and Agroserra from Gani Hajzeri in Mitrovica, are the proper size for transplanting and are clean and healthy.

Asparagus crowns are generally planted before the proliferation of shooting from the rhizomes occurs in the early spring and after the last threat of frost. The size of the crown should be a minimum of 2.5 to 3.0 centimeters in diameter when planting. Roots should be prolific and white with multiple clean, white root hairs, as in the picture above. Any damaged crowns should be discarded.

Other items for consideration including row spacing and depth of furrow, irrigation drip line placement and scheduling, , fertilizer placement and amount and type of material to place in the furrow, crown covering with soil and the covering schedule, and initial weed control. All of these items will be covered in the field training.

Pre-Plant Requirements

Soils & Site Selection

Light Textured Soils such as sandy loams or loamy sands, loam and up to sandy clay loam soils are suitable.

Rooting depth is 1.5 meters so any hardpans or sub-surface barriers within the rooting zone will limit growth and development.

Asparagus should not be planted to areas planted to asparagus in the past. Autotoxins and the buildup of plant diseases will reduce future production.

Drainage is important so leveling to permit slow water run-off is recommended.

Planting asparagus should be on flat to slightly sloping area for ease of mechanical field operations and for sufficient drainage.

Avoid areas where standing water exists for more than eight hours after a heavy rain.

Soil pH range is best at 6.2 to 7.5. Adjustments for low pH include additions of agriculture lime while high pH's can be adjusted with sulfur containing fertilizers.

Variety Selection

UC 157 (F1 Hybrid) – The most commonly used variety around the world for commercial asparagus production. Adapted for warm climates and moist soils and shows tolerance to Fusarium and Rust.

UC 115 (DePaoli Hybrid) – Suited for early production in warm climates. The spear heads remain tightly closed until the spear is tall, resulting in a high level of spear quality. DePaoli has moderate levels of tolerance to Phytopthora spear rot.

Jersey Giant – All Male hybrid developed at Rutgers University of the United States. It is adapted to temperate and cool climates. Spear size is medium to small and yield potential is high. The color is green with slightly purple bract. The variety shows resistance to rust.

Selecting the UC developed varieties and the Jersey/Rutgers varieties will provide a thorough evaluation for yield and quality, disease resistance and longevity under the environmental conditions of Kosovo. Over time, some European and Canadian varieties should be explored as alternatives as those adapted to the local markets within the region and to cooler temperate climates.

Planting Material

Planting material is eight to nine month old nursery grown crowns.

The plants were started from seed in trays in August and transferred to bags in October to grow out under greenhouse conditions.

Planting one year old crowns in spring will produce yields of seven hundred fifty (750) kilograms to one thousand (1,000) kilograms per hectare of asparagus the following year.

Land Preparation

Soil should be worked properly and loose up to 40 centimeters to 50 centimeters depth.

With a furrow cultivator or plow, open trenches at least 30 centimeters deep and 150 centimeters, center – to – center.

Installing Drip Irrigation Tube

Irrigation design and layout is determined according to the water source and distance to water source.

Water quality should be checked prior to installation and adjusted if necessary prior to any irrigation operations.

Specifications of the drip tube: 16 mil thickness, 25 centimeter emitter spacing and flow rate of 2 liters per hour.

Lay the specified drip tube at the bottom of the furrow and cover with soil.

Attach to the sub-main line and test the system.

Have the drip irrigation systems connected and functioning before planting.

Fertilization

A dry fertilizer can be broadcast and incorporated during the land preparation cycle or placed into the trench during planting. Mix the fertilizer into the soil if placing the fertilizer in the trench to avoid contact of the high concentration of material with the roots.

A liquid fertilizer can be applied after the installation of the drip irrigation system.

The volume of fertilizer is determined based on the results of the soil analysis. The quantity of nutrients in 800 kilograms of 15-15-15 fertilizer may serve as a guide.

The major nutrients of nitrogen, phosphorous and potassium as well as the other macronutrients and micro-nutriens are essential for growth of the asparagus plants.

Planting Requirements

Planting Crowns

Determine the plant to plant spacing according to the desired density.

Place a mound of soil in the bottom of the trench.

Take the crown out of the nursery bag, cleaning away the soil from around the roots and cutting the ferns and shoots at about 8 centimeters above the top of the crown. Spread out the roots as much as possible.

Place the crown, root down, on the mound of soil.

Cover the crowns with 5 centimeters soil making sure it is compact around the roots.

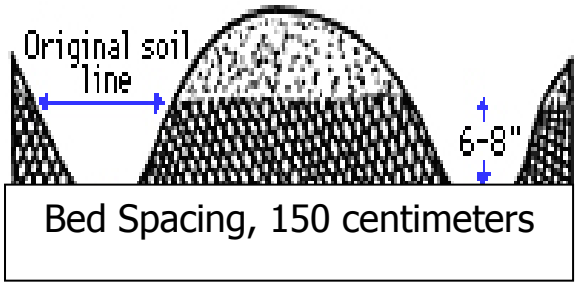
Water the crowns as soon as possible with sufficient water to wet the surrounding soil and keep the crowns hydrated.

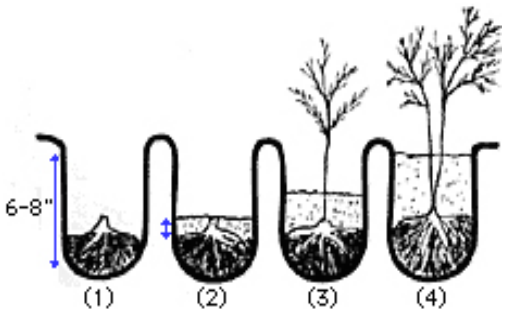
It is critical to keep the crowns and asparagus plants from drying out during the initial two to three weeks.

Crown Cover

As the summer progresses observe the shooting of spears and formation of ferns.

Cover the crowns in the fall up to the level of the determined height of 15 centimeters to 20 centimeters above the level of the original crown.





1. Crown placed at 15 – 20 cm
2. Buried with 5 cm soil at planting
3. Cover in a few months as ferns grow
4. Final crown position at 15 – 20 cm below the surface.

Weed Control & Cultivation

Elimination of the noxious weeds prior to planting is critical. Maintain the weeds with a combination of hand weeding, cultivation and herbicide applications.

Approved herbicides are listed in the asparagus production manual.

Cultivation of the bed can serve many purposes. One of the most common row cultivators for asparagus beds is a Lilliston Rolling cultivator. A row crop cultivator can also be used to reform the troughs and throw dirt up and onto the beds to reshape them and cover weeds. Also, a self-propelled roto-vator can be used between the beds while pushing soil over the top of the beds to get the height back to the original position.

Asparagus production will require a lot of attention, considerable labor especially at harvest and continuous experimentation to be able to get the maximum yield and spear quality.

May 20 - June 2, 2012