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IMPROVING PASTURE AND FORAGE PRODUCTION

KOSOVO CLUSTER AND BUSINESS SUPPORT PROJECT

September 14, 2006

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IMPROVING PASTURE AND FORAGE PRODUCTION

THE REPORT DESCRIBES THE BENEFITS THAT FARMERS CAN OBTAIN FROM THE PROPER PREPARATION OF FORAGE AND SILAGE FEED IN ORDER TO MAXIMIZE THE NUTRITIVE VALUE OF FORAGE PRODUCTION. IT IS A CONTINUATION OF WORK PERFORMED UNDER TWO PREVIOUS ASSIGNMENTS, ONE IN MAY 2005 AND A SECOND IN MAY 2006.

Kosovo Cluster and Business Support project – Improving Pastures and Forage Production
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PURPOSE OF ASSIGNMENT

The purpose of this assignment is to improve pasture and forage production for milk producers of the Kosovo Association of Milk Producers (KAMP) and other farmer associations by visiting farms in different areas, preparing recommendations for improving forages for dairy producers, and giving field workshops and presentations to farmers and other stakeholders.

BACKGROUND

Proper preparation of forage and silage feed represents the most important factor influencing the nutritive value of forage production. The cost of feed represents over 60% of the total cost of milk production.

Currently in Kosovo, there are more than 130 farms with 10-150 cows per farm. The average yield per cow is still very low. One of the reasons for this is the bad quality of forage, untimely harvesting and the failure to feed the animals high protein & energy feed. The key to producing high quality forage is the timing of the harvest. As forages (grasses or legumes) mature, the amount of fiber increases and the amount of protein and energy decreases, resulting in poor performance from the cows. High quality forages are a must if the farmer is going to have a high producing herd of cows. Just going to the field and harvesting the forage earlier can achieve a substantial increase in the amount of milk produced per cow.

EXECUTIVE SUMMARY

This assignment was a follow up to two KCBS assignments made in 2005 and one in 2006. Many of the larger farmers, which I worked with last year, have adopted the recommendations I had given. They volunteered information to other farmers in training sessions as to how much their milk yields had improved as a result of cutting silage at the correct point of its growth. Many farmers are making corn silage for he first time. Many began cutting during my visit as I recommended. This is about two weeks earlier than in the past and will dramatically improve milk production.

During this visit there was more interaction with other stakeholders, particularly the University Faculty of Agriculture, the Ministry of Agriculture, and the ministry of Education. The KAMP initiative in round baling was well received by the farmers and many farmers were seeing benefits from high quality forage. KCBS should continue to support the initiative by collecting feedback, producing educational leaflets and working with University Faculty to set up process for analyzing forage samples from farmers and associations.

In visits to pastures [one of the most underutilized resources in Kosovo], where KCBS is conducting field trials, we held field days, discussing fertilizers applied to the different pastures this spring and the growth difference. I recommend that KCBS should have fertilized pasture sites for field days next year and also have several sites with different legume establishment methods. A forage team of University faculty from many disciplines, Ministry of Agriculture, farm advisors, and sheep and cattle growers should be assembled to make unified recommendations for pasture improvement and to define research needs.

FIELD ACTIVITIES TO ACHIEVE PURPOSES

Fieldwork consisted mainly in visiting specific farms and studying their practices. The visits concluded with recommendations for improving practices in such matters as forage collection, seed preparation, fertilizing practices, harvesting equipment settings and adjustments, and storage of silage. In respect of the latter, I provided much advice on silage bunker layouts and management. At several farms, I performed periodic sampling of alfalfa yield and quality.

My assignment coincided with corn silage harvesting. I was able to advise on the correct maturity stage for proper moisture content silage should have before being ensiled

I gave seminars, often at the farms to which several farmers from neighboring farms came; and I also met with other stakeholders to help arrange better silage forage testing, to consider how pasture leases might encourage better farmer management, and to inform University faculty about pasture trials.

RECORD OF DAILY ACTIVITIES

Following is a list of my daily activities during the course of this assignment with details of the activities.

Aug 28

Worked in office preparing for meetings and presentations. I met with Milazem to plan a work schedule. Meet with Dr. Sylë Sylanaj, executive director of HAK association to discuss results of pasture trials and interpretation of the data in the report.

Aug 29

Visited Rudina Dairy near Prizen. They have followed KCBS recommendations on planting and management and were just finishing corn chopping. They said they had harvested about 1,000 tons and had sold 400 tons silage to neighbors because of the recognized quality of the silage. The corn was near the final recommended stages so they had harvested it during the last week in a timely manner. We took a sample of their baleage for analysis. He had a roll of duct tape in the office which we used to patch the holes in the plastic after the bales were sampled. I recommend that KCBS buy rolls of this tape and show farmers how to use to patch holes. Their main complaint last spring was that the plastic tape they were using to patch holes dried out and fell off. This duct tape is commonly used in the US and does not fall off as the plastic tapes do.

I spoke with the owner about planting 12 rows of headlands (rows perpendicular to the rest of the field). Without them, they were spending much time hand cutting the last few feet of each row and/or driving over it. The owner was concerned about cultivating but I described how we generally lifted the cultivator and turned on the headlands with minimal corn lost.

We visited another farmer, Isa Dina who had a field with a portion planted with the Pioneer hybrid and a portion planted with a French hybrid. The French hybrid had come with fertilizer to apply and had been planted at a higher plant population. The Pioneer hybrid had been planted at a lower than recommended plant density and had received only 50 kg N/ha when abut 160 kg N/ha would be recommended. The plants were clearly nitrogen deficient. They were shorter, yellow, and lower yielding. He was asking about making silage but, because of the nitrogen deficiency, the corn had matured beyond the stage recommended for silage and we recommended that he harvest it for grain.

We visited a third farmer, Xhevdent Morina, who had excellent looking corn. He had fertilized with about 165 kg/ha nitrogen plus some manure. This may have been slightly more than needed due to the manure application. The corn was 0.5 meter taller than the

pervious farmer's and Xhevdent was going to have excellent yields. We determined that he should start chopping immediately. Milazem had visited and estimated that it would be ready to harvest this weekend. Whole plant corn dries an average of 0.5% per day at this time of year. However, with the exceedingly hot weather last week, the corn had likely dried at close to 1% per day. We also sampled the baleage for analysis.

Aug 30

We visited Lulzim Shamolli from the Ministry of Agriculture who is responsible for pasture lands. We discussed the need to improve pasture to make it more productive. His concern is that lamb production is less than one sixth of what it was before the war. He agreed that the need was to interseed legumes and to fertilize and then to rest pastures periodically. We discussed ways to encourage this. He was willing to partner with KCBS and a farmer association to purchase a no-tillage drill for membership use. He is working with KTA to transition the public lands they hold. He felt that by the end of the year an agreement would be reached on leasing the land to farmers. The Ministry of Agriculture would be responsible for the leasing. I discussed the need for a multiyear lease if the farmers were to make improvements. I also discussed the possibility of a lower first year lease if improvements were made. He thought both were possibilities.

We visited with Dr. Ragip Kastrini in the Agriculture faculty at the University who has run for the forage analysis. He discussed the samples that were run this summer for KCBS. He had run them on the NIRS and then repeated the analysis with wet chemistry. He said the results were very comparable. I asked if I could get a copy of results run both ways (only one final result was sent to KCBS). He said he would send. He felt that in the future we could run only NIRS which would be much less expensive and faster.

We discussed the baleage samples we brought in. I asked for dry matter, crude protein, and NDF. He wanted to include Ca and P (these are a part of the printout package of the NIRS). I also asked for a pH analysis to determine the extent of fermentation in the bales. He had a more complicated pH procedure but I recommended simply putting 10g of fresh silage in a 50 ml beaker, covering silage with distilled water, shaking periodically, and then measuring pH with a pH meter about 2 to 4 hours after initial wetting. It will be important to get baleage samples to the lab within 24 hours or to freeze the samples if we want silage pH.

Aug 31

Al Wannus, Milazem and Illia (from TV station) went to Gjakove to give a presentation to Farmers Association. There were 42 farmers present and about a dozen others. I talked about silage making (both for wrapped bales and for corn silage). Tom Geld, Association president reported that those making corn silage had increased from 1 or 2 farmers making it a couple years ago to over 40 farmers this year, in large part due to the efforts of KCBS. We visited a farm and talked about agronomic characteristics of corn silage production. (They had fertilized well; we could show the difference between fertilized and unfertilized based on fertilizer applicator skips). However the plant population was low and we discussed how yield could be increased by more plants per hectare and show how this was indicated by ear size (they were larger than optimum). We discussed the silage making; they were chopping and had begun to fill a bunker silo. It was lined with plastic (a good practice) and they were hand unloading. We discussed how they could pack it better. The silage also had too many long particles. This was likely due to running the chopper at too slow an rpm for the ground speed of the tractor. The longer particles would make packing more difficult.

Sept 1

Went to Malisheva and gave a presentation to the farmer's association concerning silage making. There were 17 farmers present. They asked many questions. Over half were making corn silage for the first time. After the seminar we walked to a nearby field and talked about the production of corn silage and when to harvest. Both fields were planted at lower than desirable populations. The lower plant populations reduced yield. One field had been replanted in May and would not be ready to harvest for about 2 weeks. The other field was at ¼ milkline and would be ready to harvest to 2 to 4 days.

Sept 2

Visited Acareve pasture trial site of HAK. We inspected the plots with Dr Fadil Millaku and Dr. Sylë Sylanaj (professors from the University and project coordinator and executive director, respectively, for pasture trials). The site overall looked the worst it will this season because there has been a month or more of extremely hot, dry weather. The pasture will green up when the fall rains start. It appears that tall fescue was the best grass for this site. It also appears that alfalfa and white clover might be better legume choices than red clover due to their greater drought tolerance. Good stands of the grass occurred especially in the wheel tracks from when the field was disked. I believe this means broad cast seeding with some surface tillage and getting a firm soil will be a successful seeding method without the expense of a seeding drill.

We had a field day with about 17 people present. A regional agricultural advisor was present. We spoke with her and she said that she thought that the trial was worthwhile and she would host a seminar or help distribute any information KCBS made available. Among those present was the mayor of the 7 surrounding villages. He appears to be a good contact for the future.

Sept 4

Visited Lipjan Agricultural School. They have some variety plots of grasses and alfalfa that had just been cut. We talked about harvesting alfalfa. They were following the recommendations of the seminar that I gave there last spring. They have cut alfalfa 4 times already (instead of the usual 2 or 3) and may take a fifth cutting. They have fed the higher quality hay to a Holstein cow that freshened this spring and it is giving up to 10 liters per day more than last year and with less concentrate feed.

We visited a farmer near Ferizaj, Prapashtica (Shefki Asllani). He had made round bale silage and was very happy with the results. He had bales with a number of holes that he had patched with plastic tape. The tape was coming off and we discussed how he should patch holes with duct tape because it does not break down under UV light and fall off like the plastic tape. We discussed how he could have bales with less holes to start with. We looked at some alfalfa he had cut yesterday. He plan was to spread it out this evening and then rake it and bale it tomorrow. We discussed how he should try to make a wider windrow to begin with and then avoid the spreading or spread immediately after mowing. Spreading partially dried alfalfa causes the leaves to fall off and he will end up with poor quality hay. His corn was ready to be harvested and we recommended that he start as soon as possible.

We visited a second farmer near Ferizaj, Bajram Mujota and looked at his corn. It was planted after harvest of wheat and was just pollinating. I recommended that he should wait until 1 week after a killing frost and harvest the forage for silage. We saw another field that was near to harvest and I recommended beginning harvest on Thursday. Both fields had thin stands. The second field was also short. He apparently took cheap seed from Switzerland. Because of the thin stand and short height he was going to have less than half the yield he could have had.

We visited a third farm, Avdullah Isufi (Lloshkobare) but he was plowing about 20 km away and his farmhand, who we were supposed to meet, was not available. We did look at the disk mower and discuss how it could be adjusted to produce a wider swath for cut alfalfa.

Sept 5

I worked in office to develop slide set for pasture seminar and field discussion. I also developed a flyer for pasture management that KCBS can distribute and produced a summary of results for USAID.

Sept 6

We drove to Podujevo region and I gave a presentation on silage preparation to about 8 farmers and a similar number of advisors and administrators. After the presentation we visited field (Mustaf Deda) to continued presentation. We discussed the proper time to cut (half milkline - now) and they chopped some corn and we discussed proper silage cutting length. An educator from the Municipality was present to take pictures to make a CD on corn silage harvesting which will be distributed to farmers. The Vice Mayor of the municipality was present. We went to the farm and discussed some of the principles of wrapped bales. He had wrapped from alfalfa for silage. It was too wet when wrapped and fermentation was poor. His bales were also wrapped with only two layers of plastic and they had spoiled. We talked about filling his bunker silo.

We went to Orlian and visited the HAK pasture test site with Syle Sylanaj and Fadil Millaku. We had a field day for about the 16 farmers and educators who were present. Portions of plot areas that had been fertilized and seeded were fenced off and we were able to demonstrate the value of resting pastures as well as the value of overseeding and fertilizing. Mr. Shukri Maxhumi, (shumax4@hotmail.com, 044-148434) Ministry of Education Science and Technology, was present for the field day and said that they wanted to include some of this information in future educational efforts.

Sept 7

We went to Leposaviq and spoke to a group of 8 farmers in the municipal building. We talked both about silage and about improving pastures. There is good discussion among the participants. The municipal agricultural advisor was there and he offered to work with us and distribute material. The farmers asked if we could do a pasture trial there next year like we did in other parts of Kosovo. The municipal agricultural advisor recommended two trials, one in each of two northern municipalities. We discussed the potential of them forming a group to purchase a chopper and then we could hold winter trainings and they could plant corn for silage and then harvest next fall.

Sept 8

Met with Dr. Bexhet Mustafa (Vice Regent of Pristina University) and Dr. Sylë Sylanaj. We discussed the importance of pastures. Dr. Mustafa had worked with alpine pastures in Austria and is a part of the Medical and Biological faculties of Pristina University. He is interested in increasing pasture usage in Kosovo. We discussed the need to form Pasture Team composed of University faculty of botanists, soil fertility experts, veterinarians, and animal scientists from the University as well as Advisors, and some Association members (total of 15 people) to develop unified recommendations for pasture use and to develop list of research needs.

We visited with Dr. Ragip Kastrini, concerning the baleage forage analysis. He reported laboratory dry matter ADF, crude protein, calcium, phosphorus and pH. We repeated that we need 'as received dry matter' or 'as fed' dry matter not laboratory dry matter and we also need NDF. Calcium and Phosphorus are unimportant. I will write a protocol for sampling and for laboratory handling of samples.

Sept 9

Worked on reports and future educational leaflets for KCBS.

TASK FINDINGS AND RECOMMENDATIONS

These have been incorporated in the foregoing Record of Daily Activities.

CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE ACTIVITY

1) Get both near infrared reflectance (NIR) and chemistry data for alfalfa stage of maturity samples run earlier this year from the University. He ran data both ways but only submitted one to KCBS. This data can be used to prove that NIR works well. NIR analysis will make analysis cheaper for farmers and will improve turn around time so farmers get results before feedstuff has been fed.
2) The KCBS-KAMP bale wrapped project was a great success and was well received by the public.
    a. Need to get forage analysis of some baleage made with KCBS support to show increased quality of baleage compared to hay. Analyses should include dry matter, crude protein, neutral detergent fiber, and pH.
    b. Need to educate about use of duct to repair holes rather than plastic tape which degrades in UV light and fall off.
3) Regarding the pasture trials with HAK:
    a. We should get the soil test results that were conducted on the HAK pasture test sites.
    b. Next spring we should fertilize the HAK pasture test sites according to soil test recommendations and paying special attention to applying 50 kg nitrogen/ha in mid April. (You might recommend as applying 10 kg to 32 by 32 meter area of each plot type (fertilized only, fertilized and seeded with grasses, and fertilized and seeded with both grasses and legumes).
    c. We should get a listing of the specific varieties of alfalfa and clover seeded in this trial. This will let us determine if appropriate variety selections (e.g. adequate winterhardiness) were made of each species for pastures.
    d. Should get a percentage of each species of seeded grass and clover at each of five sites. So that we can determine which grass is best at various sites and use only one grass and one legume for future seeding trials.
    e. Should work with Fadil and Syle to develop pasture improvement recommendations based on the % of grass present (i.e. if significant grass present fertilize only and/or seed legume only).
4) Should begin pasture establishment trials at several sites. The gold standard is to seed with a no-till drill but these drills are expensive and therefore seldom used. Options include 1) broadcasting seed onto soil surface just after frost is gone in spring and going over with a disk or harrow; 2) broadcasting seed onto soil surface just after frost is gone and going over with cattle or sheep herd, and 3) broadcasting seed onto soil surface and allowing daily thaw and nightly freeze to incorporate seed.
5) Should work to establish a Pasture Team, including University faculty of different disciplines, Ministry of Agriculture staff, advisors, and Association representatives to develop approaches for improving pasture production.
6) The possibility of forage seed production should be explored. One or two test sites should be established to plant various clovers for seed production.
7) Work with the ministry of Agriculture to encourage development of pasture leases that encourage pasture improvement and good management.
    a. Need a multiyear lease if the farmers are to make improvements.
    b. A lower first year lease if improvements were made would encourage improvements.

ANNEXES

Annex I: Establishing alfalfa – Trifold Flyer

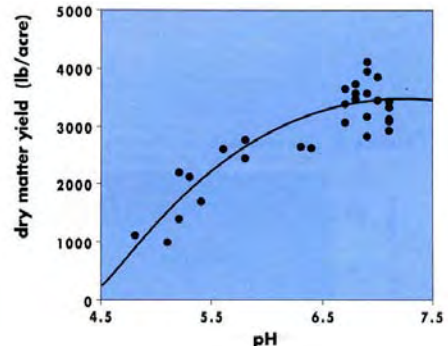
Annex II: PowerPoint Presentation to USAID

1) Soil test

Soil pH must be above 6.5

if lower add lime 1 year before seeding alfalfa.

Add phosphorus, potassium, boron, and sulfur fertilizer is recommended by soil test.



Effect of Soil pH on Yield

2) Select a good variety

Some varieties establish better and yield more than others

3) Choose best establishment method

- Direct Seeding
- Oats & grass herbicide
- With Companion crop
  - Use 60 kg/ha oats
  - or 4 kg/ha Italian ryegrass

4) Seed at appropriate time

- Either spring or late summer seeding works well
- Seed in early April or mid August

5) Prepare a firm, smooth seedbed

Soil field should be weed-free. Soil should clod free. It should be firm enough so that shoe does not sink more than half cm

6) Use correct seeding rate

- 1 kg/ha = 50 seeds/m^2
- Expect60% germination and emergence if good seed
- 40% plant survival during the 1st season
- Target at end of seeding year is 200 to 300 plants/m^2

7) Inoculate seed with Rhizobia bacteria

Inoculum should be less than 6 months old and be kept in cool spot until used

Without (left) and with (right) innoculum

8) Place seed at proper depth

Place seed 0.6 to 1.2 cm deep

9) Control weeds during first 60 days after seeding

Weeds during the first 60 days will thin stand. Spray if weeds less than 10 cm tall or if alfalfa is over 35 cm tall and weedy harvest to control weeds

10) Harvest 60 days after planting

Take 1 to 3 cuttings in seeding year.

Why Grow Alfalfa?

- ✓ **High quality forage**
  - Source of energy for animals
  - Source of protein for animals
- ✓ **Does not need nitrogen fertilizer**
- ✓ **Provides nitrogen fertilizer for the next crop**
- ✓ **Corn (either grain or silage) and wheat yield 10 to 15% more following alfalfa than continuous cropping.**

Corn yields following alfalfa than following corn

ANNEX I

Ten Steps To Establishing Alfalfa

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Improving Pasture and Forage Production

Purpose of the assignment

- To improve pasture and forage production for milk producers
- Prepare recommendation for improving forages for dairy producers
- To participate on field workshops and presentations to farmers and other stakeholders
- Work with Agriculture Faculty to improve forage testing for farmers

- Visit selected crop producers, pastures, and feed forage producers;
  - To Determine the conditions of forage production, and determine quality of feed.
  - To Identify resources needed based on six selected farm visits
  - Identify efforts by KCBS staff in following-up with these farmers and others.

- Check procedures producers used in collecting of forage samples for testing

  Sample of baleage and grasses at different stages of maturity and analyze for forage quality

- Organize Seminars
  - Two seminars on good harvesting time for corn silage
  - One seminar on silage preparation
  - Two seminars on good pasture management

- Recommendations and plans for future implementation to be used by KCBS staff and local service providers in future trainings.
- Develop tools for KCBS staff to use and distribute
  - Flyers
  - Slide sets

Visit selected crop producers, pastures, and feed forage producers in different area

Gjakove, Prizren, Lypjan, Peje, Podujeve,

Vushtrri, Malishev, Rahovec

Pasture Establishment Sites

- Visited pasture management subcontract plots
- Visited sites at Kacanik and Prizren
- Made specific recommendations for each sites

Major messages

- Harvest forage at proper stage for high quality
- Harvest forage at proper stage for ensiling
- Sample forage to know forage quality and supplement needed
- Improve pasture
  - interseed legumes
  - fertilize
  - rest pastures during grazing


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Thank you