Thinking about our climate while waiting for spring . . .

Our Western Slope climate is a wonderful natural resource – the sunshine, the low humidity, the changing seasons, the drainage winds and the nearby mountain snows that provide most of our water while we stay dry. Sometimes we think of climate simply as the average precipitation and temperature and not much more than that. But climate encompasses much more -- the seasonal cycles, the occasional extremes, and the year-to-year fluctuations too. There have been plenty of them to talk about lately.

We always have our ups and downs, but the differences have been particularly impressive lately. For example, who would have imagined this winter being this cold (13 deg F below average for January 2013) after being so mild in November and early December. What was that fog all about and the January rainstorm? And what about the heat and drought this past year following so quickly on the heels of the super abundant high water we had back in 2011. 2012 wasn’t as bad as the drought years of 2002 or 1977 in terms of streamflow, but it certainly wasn’t good.

What would it be like if we had back-to-back years like that? Based on over 100 years of data, back-to-back dry years for the Colorado High Country are, fortunately, quite rare. It did happen back around 1900 for up to 4 straight years. But since then the really low runoff years have tended to come individually. That being said, we are staring another dry year in the face right now. As of the end of January 2013, the snowpack in the Upper Colorado River basin is only 66% of average – better than it was a few days ago, but still not great. There is less than a 20% chance statistically that we’ll end up with an average year for snowpack and water supplies based on where we stand now. And if we have another warm, early spring and

and early melt like last year, water supplies could be reduced again.

Weather forecasters are doing a darn good job predicting daily weather for the next week or so. Their forecasts keep getting better farther in advance. But climate predictions for what spring and summer will be like are not yet skillful. Sometimes the El Nino Southern Oscillation gives us some useful clues - but not this year (it’s “neutral”). I can tell you with confidence that I am very uncertain about the next few months. I wish I could be more helpful. But as we look ahead enthusiastically to spring (and spring can kick in quickly on the W. Slope) the best we can do is warn you that this current drought could very well continue. Plan accordingly.

The Colorado Climate Center tracks climate and projected water supplies very closely. If you would like to receive a weekly update by e-mail for the Upper Colorado River basin, please let me know.

Also, we would appreciate help improving rainfall monitoring in W. Colorado. If you are interested in being a rain gauge volunteer, please check out http://www.cocorahs.org. If it looks like something you might want to help with, click the “Join CoCoRaHS” button.

For more information about this article contact: Nolan Doesken, State Climatologist, Colorado Climate Center, Department of Atmospheric Science, Colorado State University, Fort Collins, CO 80523-1371, 970 491-3690, Nolan.Doesken@Colostate.edu.
Evaluating other Markets for Olathe Sweet Corn

Eating fresh Olathe sweet corn is one of the highlights of summertime dining. How would you like to see Olathe sweet corn available year round? Tri River Area Extension agent Bob Hammon and the Colorado West Sweet Corn Market Order were awarded a specialty crops grant from the Colorado Department of Agriculture to conduct a study on the feasibility of the commercial production of frozen Olathe sweet corn.

Bob and project coordinator, Elizabeth Neubauer, an advanced Master Gardener and culinary arts student at the Western Colorado Community College (WCCC) managed the acquisition, processing, packaging and freezing of almost 700 pounds of sweet corn kernels cut from the cob during the 2012 growing season.

The frozen product was evaluated with group taste tests, individuals at sweet corn evaluation give-away sites, and distribution to chefs at locally owned restaurants. There was great diversity of evaluators, from the local Rotary Club, to Mesa County Health and Human Services employees, to clients of Child and Migrant Services, for whom the evaluation form was translated into Spanish. The consensus was clear: the vast majority of evaluators thought the product was great, superior to the high end frozen corn available at national supermarket and health food outlets.

The problem comes in the economics of processing our corn. Olathe sweet corn has earned a reputation based on its quality, which can’t be compromised by an inferior product bearing the Olathe-grown name. High volume canned and frozen corn is a different genetic type than that used in fresh market production at Olathe. The processing-corn varieties are high yield, tougher kernels that can stand the bruising of mechanical harvest and dehusking. The Sugary Enhanced, one of the standard types of sweet corn, and related genetic types used in Olathe’s fresh market production requires special harvest and handling to prevent bruising and to maintain product quality. When combined with smaller kernel sizes it adds up to higher production costs.

After conducting an economic analysis with Rod Sharp, CSU Extension Western Region Agricultural Economist, it became obvious that large scale processing of our fresh market varieties would not be economically feasible. The project used an economic model developed by Rod to evaluate several different scenarios to see if there was a way to get processing costs below $2.00 a pound.

We decided to use an economic model that starts with small-scale processing, mechanizing only the dehusking and kernel cutting steps in the process. Even this would take an initial investment in excess of $100,000, five or more seasonal employees, and would require a breakeven price of about $3.00 per pound to produce about 15,000 pounds of frozen sweet corn during the two-month harvest season.

If a frozen Olathe sweet corn product ever becomes available in home-meal sized packaging, it will be a high end, niche market delicacy. Another alternative is to package for commercial usage, either in restaurants or as an ingredient in value-added products. The Western Colorado Community College Culinary Arts Program student-run restaurant, Chez Lena, is featuring an Olathe sweet corn based Crème Brulee dessert during their winter semester. Another high-end Grand Junction restaurant chose the frozen sweet corn to use in a corn chowder entry in a local soup competition and won the Peoples Choice Award, gathering the most votes from the public participants.

(Continued Page 8)
Update from Dr. Frank Johnson, Interim Manager, Western Colorado Research Center (WCRC)

For the past two years, I have been serving as the Interim Manager of WCRC as well as the Associate Director of the CSU Agricultural Experiment Station (CAES). I thought I would give you an update on a number of personnel changes that may be of interest to you.

Dr. Lee Sommers, CAES Director, will be retiring on May 31, 2013 and I will be retiring on June 30, 2013. With these retirements, a restructuring of the College of Agricultural Sciences (CAS) and the CAES will occur. CAS Dean Craig Beyrouthy will also have the title of the CAES Director. Lee’s current position will become the CAES Deputy Director/CAS Associate Dean for Research. A search is underway to fill Lee’s position and it is anticipated that his successor will be named by April 1.

With respect to my positions, my CAES Associate Director position will become CAES Assistant Director and an internal search will be conducted in the near future. A position description is being prepared for WCRC Manager/Research Associate and a search will be initiated in February.

Dr. Amaya Atucha joined us last June as an Assistant Professor with responsibilities to conduct a tree fruit research and outreach program. Dr. Ramesh Pokharel will be leaving WCRC at June 30. He was recognized by the Western Colorado Horticultural Society as Friend of the Industry at its annual meeting in January.

John Wilhelm, a research associate at WCRC-Orchard Mesa retired December 31, 2012 after 20 years. Bryan Braddy has taken over John’s responsibilities as well as other assignments. We are in the process of filling two research associates positions – one at WCRC - Orchard Mesa and one at WCRC - Fruita. Our target date to fill the Fruita position is mid-February and the Orchard Mesa position by mid-March. We currently have the WCRC – Rogers Mesa site for sale and George Osborn continues to man that facility until its sale.

All of these changes do present challenges. However, having the opportunity to make and adapt to changes will inure to the benefit of our programs and those whom we serve.

For more information about this article contact Dr. Frank Johnson at frank.johnson@colostate.edu.

Dr. Ramesh Pokharel honored by WCHS as “Friend of the Industry”

Grow Another Row

What to do with non-saleable fruit? This was a dilemma we had at Western Colorado Research Center-Orchard Mesa.

When growing fruit and vegetables for research projects most is NOT saleable but it is edible. Amanda McQuade of “Grow Another Row” approached us two years ago and asked if we would consider donating fruit to her cause. Since then we have worked with Amanda and her energetic harvest crews to provide fruits and vegetables to the local food banks and homeless shelters in Mesa county. According to Amanda we donated over 2.5 tons of produce in 2012.

So if you have some land and a little extra time maybe you would consider “growing another row”.

You can contact Amanda at www.growanotherrow.org or at growanotherrow@gmail.com.
A Sustainable Colorado Wine Community

What is a sustainable Colorado wine community? Sustainability and viability are current buzzwords in our culture. What do they really mean, and how are they expressed in the context of Colorado agriculture and the Colorado wine industry?

To sustain, from the Latin sustener, literally means to hold from underneath or to uphold. The Random House Dictionary provides several derivative meanings, including: "...to keep going, as an action or process..." and "...to provide for (an institution or the like)...". Synonyms include: "...to maintain or to nurture...".

To be viable, from the Latin vita + haber, literally means life having. The Random House Dictionary provides several derivative meanings, including: "...having the ability to grow or develop..." and "...practicable or workable...".

In daily use, the meanings of sustainability and viability are not so precise, and can have a lot of variability in economic, political and social applications. However, most of us might agree that a sustainable entity is socially, environmentally, and economically responsible. Many of us in agriculture might say that sustainable agriculture engages in practices that keep the environment healthy and food production economically and socially viable. Notice that in this definition, viability is part of agricultural sustainability, because the land hosts the living organisms needed for production of food and fiber and bio-energy.

So what are the things that will keep a Colorado wine community sustainable and viable? The wine industry is somewhat unique, in that the economic, environmental, and social components are tightly intertwined in ways unlike almost any other industry. So, to simplify this discourse, let us consider economic sustainability as the main variable, and assume the environmental and social components will follow.

Is the Colorado wine industry economically sustainable? It depends on your point of view. Right now, most vineyards and wineries do not independently generate enough revenue to pay for both their expenses and a living income for the owners. This deficit is covered by dependent income from other sources, either funds generated from another crop or another business or other salaries, or from ‘legacy’ funds that the owners previously accumulated or inherited. In many Colorado vineyard and winery enterprises, these dependency-covered deficits have occurred for many years. In most industries, these would be regarded as non-sustainable and either closed or sold. This begs the question of identity. Are these operations truly businesses, which are supposed to sustain ownership through income to live on and profits, or are they dependent hobbies of interest to the owners, but that will exist only as long as the interest and legacy money hold out? Can an industry, consisting mostly of a generational turnover of dependent hobbyists with legacy money, hope to be sustainable and grow? Who will invest the resources necessary to grow the Colorado wine industry if the industry never makes a profit?

Why is the Colorado wine industry in this position of dependent economics, leading to questionable sustainability? There are both historical and agricultural causes.

Historically, most modern Colorado vineyards and wineries were started by industry pioneers, who started an industry in an unproven physical and economic location, and often with very limited practical experience in the industry, especially with regard to climate, soils, and horticultural and winemaking practices. As well, most of these industry pioneers invested and maintained their enterprises with either external income or legacy money, alleviating the pressure to have a profitable industry. However, despite economic deficits, these pioneers have had a strong commitment to the industry, and their accumulated experiences and financial investments are the basis for future sustainability, including economic, environmental, and social components.
and social components. Many of these pioneers are still in the industry, but will soon turn over their enterprises to the next business generation of the industry. This turnover phase of the industry is critical to industry growth and sustainability. The emotional and financial investment of the pioneer generation in the industry must be converted to a new generation of much more economically sustainable enterprises. The alternative is growth stagnation and eventual decline.

Also historically, wine made in Colorado faces many market barriers. The most difficult barrier is establishing a brand reputation for new products from an unknown region, within a national industry that sells highly on already established regional brands. As well, many novice winemakers took years to develop a Colorado wine brand with wines of consistent sensory quality, though most now do so very well. The effort to promote the Colorado wine brand has been largely successful in the last decade, but an increase in industry volume and product niche placements is needed for industry growth. In terms of location, most vineyards and many wineries are not near consumer population centers. This geographic barrier to distribution has been compounded by the low volumes of each wine niche produced by each winery, making consistent supplies to larger populations, necessary for industry consumer growth, very difficult.

The main agricultural impediment to sustainability was the initial assessment that growing *Vitis vinifera* grapes in Colorado was a climatic given for the Grand Valley and West Elks AVAs. This assessment has proven to be less than dependable, even in the best locations. Unpredictable cold events in fall, winter, and spring have imposed a heavy burden on economic viability for vineyards. As well, many new growers do not have experience with this agricultural region or with horticulture, and they often repeat the mistakes of earlier novices in site selection and variety choices and in marketing to wineries. This dependence on unreliable supplies of *Vitis vinifera* grapes has also been compounded by the difficulties, both perceived and actual, of creating a market for the non-traditional flavor profiles of wines from cold-hardy hybrid grape varieties. This creation of new consumer wine niches is riskier and requires more intensive education of consumers, and thus engenders initial reluctance in winery participation.

So what are the needs and possible solutions for achieving growth and economic sustainability for the Colorado wine industry?

First, the industry needs more acreage of grapes and higher yields per acre than presently achieved. These grapes should preferably be grown in Colorado, both to maintain the Colorado brand and to be able to monitor consistent grape quality at harvest. The effects of cold events must be avoided or mitigated in these new plantings. However, most sites suitable for *Vitis vinifera* cultivars are either already planted or are in peaches or converted to housing. This means that most growth in grape supply will of necessity have to rely on either planting cold-hardy hybrid cultivars or on importing grapes from outside the state. Cold-hardy hybrids have only been grown in small experimental plantings in Colorado. Thus, a learning curve will be steep in both growing and making commercially acceptable wine from these cultivars in our locations. This learning curve must be accompanied by an educational effort with consumers on behalf of these new cultivars.

Second, at WCRC, we have been experimentally growing a number of cold-hardy cultivars and making test wines from them for several years, as well as making blended wines from both *Vitis vinifera* cultivars and cold-hardy hybrids. We believe that these blended wines can be a great way to prepare the market for new wine niches that use these cold-hardy cultivars. Each year, we have industry workshops on cultivar performance in our test vineyard. We also taste and blend wines from these cultivars, to introduce them to the industry as possible wine components. Blind tastings, by Colorado consumers, of these cultivars and their blends have also led us to believe these cold-hardy hybrids can be incorporated into highly acceptable commercial wines.

Third, there must be more efforts to recruit investment capital for industry expansion and to promote high quality business plans for generational transfer of existing Colorado wineries and vineyards.

(Continued Page 6)
Familiar Faces Moving On From CSU Extension

Two of our long-time CSU Extension professionals have moved on to greener pastures over the past few months.

Curt Swift, Area Horticulturalist, retired at the end of August. Dr. Swift was with Extension for 33 years. Although Dr. Swift has officially retired from CSU Extension, he won’t be sitting on the front porch in a rocking chair watching the weeds grow. He has started his own consulting firm, Swift Horticulture Consulting and High Altitude Lavender.

Robbie Baird LeValley, Area Livestock and Range Management Agent, left CSU Extension to take a top spot in Delta as the Delta County Manager at the end of September. Robbie was with CSU Extension for 23 years and during that time took Extension to a whole new level with her innovative programs and knack for forming relationships.

The Area Horticulturalist position is currently being advertised with a closing date of February 13th. The overall purpose of this position is to provide leadership and organization in the development, implementation, evaluation, and reporting of educational programs in Horticulture in the Tri River Area, and to serve as a County Department Head for Mesa County as part of the Tri River Area Extension program.

Interviews for the Area Livestock and Range Management position were held on January 16th and 17th. Four excellent candidates were interviewed and negotiations are currently underway.

For more information about this article contact Rhonda Follman at rhonda.follman@colostate.edu. Rhonda Follman is the Extension Area Director located at the Fairgrounds in Grand Junction.

(Western Phytoworks)

(Sustainable CO Wine Community-Continued from Page 5)

To get this capital, we must convince investors that growth in size, market penetration, and continued wine quality can be coordinately accomplished. And we have to consider that using cold-hardy hybrids and creating a new set of consumers for wines using these cultivars may be an important part of any preferred strategy.

If cold-hardy cultivars are a necessary key to industry growth and sustainability, then we need to start soon to develop, promote, and market high quality wines from cold-hardy grapes grown in Colorado.

For more information about this article contact Dr. Stephen Menke at Stephen.menke@colostate.edu.

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Western Colorado Horticultural Society

In August 2012 the Western Colorado Horticultural Society sponsored a concert at Grande River Vineyards, “Heard it Through the Grapevine” series. The proceeds from the concert were donated to WCRC-Orchard Mesa to be used for tree fruit research. This was the second concert and the research fund has grown to $10,000. Thank you WCHS. We look forward to working with you again on this effort. The 2013 concert series is in the planning stages but watch for information at: http://www.granderivervineyards.com/events-concerts/ and come out to support agriculture in Mesa County.
Research Plot Combines Donated to the Western Colorado Research Center at Fruita

Agronomic field trials require the use of specialized field equipment designed for conducting plot research. At the Western Colorado Research Center we have historically conducted field trials on corn, small grains, soybeans, canola, and other grain crops. Plot combines are vital pieces of equipment to harvest these field trials that are conducted both on and off-station. Off-station research can span western Colorado from Delta-Montrose up to the Craig/Hayden area.

For on-station research we have used a 1949 modified Gleaner A combine for more than 25 years. At the time we obtained the Gleaner A combine it had been used for many years in another research project on the Front Range. The Gleaner A plot combine has served us well over the years but it has been showing its age and it was time to determine how to replace it. New plot combines are expensive (based on recent quotes from two companies), with costs ranging from $270,000 to $370,000. Such a large amount of money was not in the budget- at several levels. So we had to try other approaches. We contacted associates and colleagues asking if they knew of a good used plot combine. A long-time associate at Syngenta in Nebraska said he knew of a combine that we might be able to obtain as a donation. Arrangements were made between CSU and Syngenta and a 1973 Gleaner K combine was donated to WCRC-Fruita and in October 2011 the combine arrived at the research center by semi-truck from Nebraska.

We spent winter and spring 2011-2012 working on the combine- painting and modifying the machine inside and out. The “new” Gleaner K combine was used for harvesting corn grain plots in fall 2012 and it performed extremely well. We also obtained a small grain head from a farmer in Ohio and we also painted and renovated the grain head. It will be used for harvesting wheat, barley, oats, and other small grain crops. Plot harvest with the Gleaner A combine required two people to combine harvest plots. With the new Gleaner K combine only one person is needed to harvest plots. This frees up a person to perform other farm and research functions and allows us to use staff at the center more efficiently.

At the research center we have a 1976 Hege 125B combine we have used for harvesting plots on and off-station depending on the experiment and the crop. We acquired the Hege 125B combine as a used piece of equipment more than thirty years ago and it has been used heavily for harvesting for many, many field trials across western and northwestern Colorado. This small plot combine was in need of replacement. In the last few years, we typically have had to make several repairs to the Hege 125B combine during the harvest of a single field trial.

During fall 2012, Rick Novak, Director of Colorado Seed Programs at CSU in Fort Collins, visited the West Slope and the research center at Fruita. He toured our facility and when he saw our Hege 125B combine he said he might know of a better Hege that we might be able to obtain as a donation. After some checking and making a few arrangements by various people at CSU and by the donor, Fred Judson, staff member here at the research center, picked up the 1992 Hege 140 combine from the Front Range in early December 2012 and transported it back to the research center. The Hege 140 combine was a generous donation again from the Syngenta Seed Company. We are in the process of doing some maintenance and improvements on the combine. It will be an excellent contribution to our research equipment here at the research center at Fruita. We will use the Hege 140 (Continued on Page 6)
Olathe Sweet Corn—Continued from Page 2)
Several chefs who evaluated samples were ready to buy, but at a price that was closer to production cost than what a processor would need to receive to make their endeavor economically sustainable.

The final conclusion from this project is that while a frozen Olathe sweet corn product has superior flavor to other sweet corn products we tested, a processor would have to use extreme cost control measures and market to the most expensive of high-end markets. Other uses for Olathe sweet corn need to be investigated, especially the quality and application for field-dried sweet corn. This is already being used in distilled products, and further research could lead to a reasonably priced corn meal product.

For more information about this article contact Bob Hammon at bob.hammon@mesacounty.us.

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(Plot Combine—Continued from Page 7)

for harvesting off-station small-grain plots and some on-station research plots also.

Having good operating, reliable plot equipment, even though it may not be new, allows us to conduct our research in an efficient, safe, and productive manner. We extend our appreciation to our industry partners, and in this case – Syngenta, for their generous support of our research programs.

For more information about this article contact Dr. Calvin Pearson at calvin.pearson@colostate.edu.

(Irrigation Workshop Continued from Page 10)
presentation and made their presentation at the end of the day.

Day 6, July 12, 2012. The other four groups made presentations. The presentations were finished by noon. After lunch, we held closing ceremonies in which the attendees were presented certificates of completion along with comments from U.S. Embassy representatives and workshop organizers and presenters.

The workshop was highly effective and successful (see class photo below). In the words of one of the attendees, “It was really good <spending> days with you during the Trilateral Workshop and we learned very much from you.” Another attendee wrote, “The workshop had lots of benefits for us and will help us with our jobs.” A US-AID observer wrote “Your hands-on approach was excellent and I am sure everyone learned some very important and practical techniques to pass on to Afghan farmers.” The time we spent with farmers was highly productive. Our hope is that the farmers will share the positive experience they had at the workshop with other farmers and influential people in their location that will help to promote positive interactions between Afghans and the West.

For more information about this article contact Dr. Calvin Pearson at calvin.pearson@colostate.edu.
Custom Rates for Colorado Farms and Ranches

Colorado State University Extension conducts an annual survey of agricultural producers, land owners and managers, lenders, agricultural consultants, machine operators, and Extension agents. The results of this survey are a report of “custom rates” charged for various crop and livestock operations in Colorado.

The survey results are reported by region: Northern, Southern, and Western. The Northern region generally includes those counties north of I-70 and east of the Rocky Mountains. It includes the Front Range. The Southern region includes the counties in southeastern Colorado and the San Luis Valley. The Western region generally includes those counties in and west of the mountains.

The report includes rates for 1) farm tillage, 2) planting, 3) chemical and fertilizer application, 4) grain harvesting, 5) hay and silage harvesting, 6) orchard picking, pruning, and thinning, 7) hired labor, 8) crop share rental arrangements, 9) cash rental arrangements, 10) sheep shearing and tagging, 11) fertility testing of bulls and rams, 12) pregnancy testing, 13) horse shoeing and hoof trimming, 14) livestock hauling, 15) fence building, and 16) livestock grazing.

The rates reported in this report are not recommended rates, but simply indicate rates currently being charged throughout Colorado, as reported in the survey. The information in this report should be used only as a guide. Reported rates represent a variety of working conditions, machine and equipment sizes, and farm and ranch operations. They do not necessarily measure the full economic cost of performing the work specified. Some custom operators may charge only for the costs of fuel and labor. Others may charge for all costs including depreciation on equipment and allowance for risk. Field conditions, such as size, terrain, and location, may also account for variations in rates charged. Reported charges were used to determine a range of custom rate charges. “Most common” refers to the custom rate reported most often. “n/a” indicates that insufficient information was available for that particular activity.

Farm machinery and equipment needed to operate a modern farming operation can be expensive and quite specialized. Therefore, many farm operations may benefit by using custom operations and/or machinery rental to perform machinery operations. For others, custom operations may be a method to spread the fixed costs of owning farm machinery over more acres and thus reducing per unit costs and increasing cash flow.

The custom rate survey information can also be used as a management tool for estimating expenses when preparing enterprise and whole farm budgets, projected cash flow statements, and projected income statements. These values typically include all costs associated with an activity including implement and tractor costs and variable costs such as fuel, lube, and labor.

Custom rates vary significantly according to the availability in a given area, timeliness, operator skill, field size and shape, crop conditions, and performance characteristics of the machinery being used. Some operations may be offered at bargain rates due to family or neighbor relationships between the parties involved. So there is no assurance the average rates reported will cover your total costs for performing the custom service or that you will be able to hire a custom operator for the most common rate listed in the publication. If at all possible calculate your own costs carefully before determining the rate to charge or pay.

The “Custom Rates for Colorado Farms and Ranches” can be found at:
http://www.coopext.colostate.edu/ABM/custrates.htm.

For more information about this article contact Dr. Rod Sharp at rod.sharp@colostate.edu.
Irrigation Workshop Taught in Afghanistan by CSU Experts

On July 7-12, 2012, Dr. Calvin Pearson, Professor/Research Agronomist with the Western Colorado Research Center at Fruita and Denis Reich of the CSU Water Center, Grand Junction, travelled to Kabul, Afghanistan to conduct a 6-day intensive workshop on “Irrigation scheduling, crop water management, and best management practices.”

Attending the workshop were approximately thirty people, eight of which were young women (one professor from Kabul University and seven students). The attendees came from various provinces around Afghanistan and from various disciplines ranging from agronomists to civil engineers.

Day 1, July 7, 2012. Registration, welcome, and introductions. We made a presentation on the purpose of the workshop along with a pretest and general overview of crop water requirements in Colorado along with soil and water conservation methods. We also learned about Afghani agriculture and the crops that are produced in the various provinces in Afghanistan.

Day 2, July 8, 2012. The first half of the day was spent in the field showing and discussing crop water measurement methods and best management practices. In the afternoon, we had a PowerPoint presentation on irrigation efficiency calculations and concepts of evapotranspiration i.e. crop water use, and irrigation. We explained the CoAgMet weather station network and learned about Afghani efforts to initiate a weather station network, and discussed the installation and use of atmometers.

Day 3, July 9, 2012. The morning was spent at Badam Bagh Farm discussing climatic factors and how these factors affect crop water needs. We also showed how to determine soil moisture content using the feel method, how to use a ball probe, as well as demonstrating soil moisture sensors and how they can be used for irrigation scheduling.

Day 4, July 10, 2012. We had a discussion about outreach and extension methods and scenarios. Seventeen farmers from around Afghanistan joined the workshop. The morning was spent in the field at Badam Bagh Farm in small groups (see photo above), mixed with workshop attendees and farmers discussing irrigation methods and technology and best management practices. Following lunch, classroom time was spent with farmers in attendance discussing irrigation practices and technology and potential extension programming that might address some of the issues discussed.

Day 5, July 11, 2012. The first part of the day was spent presenting information about extension and outreach methods and how good teams should function. Attendees were organized into groups (teams) and the groups spent the majority of the day preparing an oral project focused on current Afghan irrigation needs using PowerPoint presentations. One group finished preparing their

(Continued Page 8)