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Knowledge to Go Places

Western Phytoworks

Western Colorado Research Center

Fall 2004

WCRC Hosts Environmental Restoration Workshop

WCRC hosted a workshop on environmental restoration in Delta, Colorado at the Bill Heddles Recreation Center on October 26, 2004. Six presentations were made by renowned experts in environmental restoration. Presentation topics were:

1. "Elements of Environment Restoration" by Dr. Russell Walker, Professor, Mesa State College.
2. "Introduction to the Ecology and Management of a Western Scourge: Tamarisk" by Dr. Anna Sher, Assistant Professor, Denver University and Director of Research, Herbaria, and Records at the Denver Botanical Garden.
3. "Reclamation Strategies and Revegetation Technology for Recovery of Sites Impacted by Invasive Species" by Dr. Kenneth D. Lair, Restoration Ecologist/Research Botanist, Bureau of Reclamation.
4. "Lessons Learned from Revegetation of the I-70 Corridor Including Glenwood Canyon" by Jim Lance, Landscape Architect, Retired, Colorado Department of Transportation.
5. "Recent Developments/Future Trends in Tamarisk Control Legislation" by Dr. Anna Sher, Assistant Professor, Denver University and Director of Research, Herbaria, and Records at the Denver Botanical Garden.
6. "Handling and Planting Techniques for Environmental Restoration using Native and Adapted Plants" by Dr. Roger Kjelgren, Associate Professor, Utah State University.

An hour-long roundtable discussion was held at the end of the workshop that provided the audience with an opportunity to ask specific questions of interest and have dialogue with the speakers. The roundtable discussion provided all speakers with an opportunity to respond to the same audience question.

Feedback from those in attendance at the workshop hailed it as a complete success. One of the attendees commented, "For the first time in a very long time at such a conference, all of the presentations kept my full attention for an entire day."

For more information about the workshop, contact Frank Kelsey at frank.kelsey@colostate.edu, Matt Rogoyski (mattew.rogoyski@colostate.edu), or Calvin Pearson (calvin.pearson@colostate.edu).

Computer Models for Fruit Crop and Pest Development

Work has been underway in 2003 & 2004 to validate computer spreadsheet programs that will calculate, track, and predict pest development (and, thereby, spray dates) for fruit crops. In addition, an effort has been made to convert an older BASIC computer program that allows us to track and forecast bud dormancy and development in the spring to a more user friendly, spreadsheet system. Both of these projects have made progress and are nearing release.

The Multi-Pest Degree Day Calculator (MPDDC) program is a Microsoft Excel-based program developed by Washington State University researchers that looks at pest development. It is available on the Web to anyone who wants to download it, but needs to be modified with local long-term weather data (daily average temperature maximums and minimums) in order to provide the predictive capability. Once that has been done, one simply enters the daily maximum and minimum temperatures for their own location and the program does the rest. It calculates the daily DD value and accumulates it for each pest included in the sheet. One then compares the accumulated DD values with the benchmark DD value

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Manual (shelter) and electronic datalogger weather station (tripod unit at left) used to collect weather at Western Colorado Research Center-Orchard Mesa

accumulations to determine appropriate spray timing (or control application). Customized files incorporating local long-term temperature data have been created for many

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growth habit of the two with a tendency to throw bottom whirl limbs that show strong vertical growth tendencies. The crotch angles of these limbs are very tight and difficult to bend down without the limb breaking off in the union, but when they are repositioned to a flatter angle the fruit set increases dramatically. They show a well defined and straight growing central leader. The Honeycrisp are not as vigorous and the central leader is less well defined. They have not yet attained the height of the Cameo, but do have flatter, easier to train lateral limbs. Outside reports had indicated that Honeycrisp would be the more susceptible to powdery mildew, but our experience is to the contrary. Cameo has been more inclined to have mildew problems but both can be cleaned up with proper pesticide applications. Fire blight has not been a problem to this point. Cameo tends to grow large fruit when adequately thinned with the largest apples developing calyx end splits when allowed to remain on the tree into later maturity. Honeycrisp have produced more of a medium sized apple. Both varieties have exhibited a tendency to alternate bear when early thinning was not adequate. Anecdotal taste tests have shown that people like both the apples and find Cameo to be a desirable midseason sweet fruit with good storage characteristics. Honeycrisp is an earlier apple with a tart flavor

that pleasantly surprises many who taste their first one. It also seems to store well. Neither fruit has shown a tendency to be 100% red, but both are very appealing in appearance. Variation in color and maturity may dictate double picking to achieve the best returns.

The center also has a planting of Honeycrisp grafted onto an old variety study block that has M26 rootstock with a large number of different interstems. It is organically managed on a three wire trellis trained to a modified french axe system with hanging microsprinklers for irrigation. A weed free strip has been successfully maintained using thermal techniques for the past three years. The growth of these trees has pushed the central leader to the top of the trellis in only two growing seasons while putting out large numbers of soft laterals with desirable crotch angles. This block is scheduled for removal in the winter of 2004/2005.

While all the above observations are based on a limited number of years experience with these apples, early indications are these may be two good new variety choices for this area of the state.

For more information about the Cameo and Honeycrisp planting at Rogers Mesa please contact George Osborn at 872-3387 ext. 4 or by email at george.osborn@colostate.edu.

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Colorado fruit-growing locations. In addition, an overview document with instructions on how to use the MPDDC program and an Excel spreadsheet file with DD information for codling moth and peach twig borer have been prepared to accompany the MPDDC program. Use over the past year at WCRC-OM and WCRC-RM has shown that the program is applicable to growers here.

The Orchard Crop Phenology program is just a bit further behind. Our old program needed GWBASIC to run it. We entered temperature data collected at our WCRC weather stations (Fig. 1) for each year beginning Oct. 1. The prediction portion of the program was applicable only for WCRC – OM because it was based on the normal year values for WCRC – OM. Use at other locations needed development of normal year values to plug in, and it was not clear how to create these in GWBASIC. Adaptation to Microsoft Excel was a logical progression (as it should be much more user friendly), but someone with both interest in the project and experience with Excel and GWBASIC was needed. Mr. Erik Hedl volunteered his time and has now completed most of the conversion from the GWBASIC platform to a Microsoft Excel platform. Initial testing and customization for locations that have long-term temperature data are planned for this fall. We hope to have customized files for several locations ready for testing this winter and spring.

For more information, contact Harold Larsen at (970) 434-3264, x-205 or via email at harold.larsen@colostate.edu.

WCRC Hosts Outreach Activities for Clientele Benefit

Part of the mission of the Western Colorado Research Center is to conduct outreach activities to address the needs of western Colorado agriculture. In pursuit of this goal, WCRC participates in and hosts a number of outreach activities throughout the year designed to meet the needs of a broad and varied spectrum of clientele. Over two dozen different outreach oriented activities have been hosted or sponsored by WCRC since January of this year, and our scientists and staff have participated in numerous other conferences and seminars within the region, state, and nation to provide training and new information in horticulture, agronomy, pest management and related disciplines. Some examples of the types of programs conducted during 2004 include a “Tree Fruit for Beginners” short course at WCRC - Orchard Mesa, and presentations on food safety and grapevine drought recovery at the 61st annual Western Colorado Horticulture Society meeting in January. Scientists from WCRC – Orchard Mesa presented seminars on tree fruit and grape production as part of Cooperative Extension’s master gardener training program, and scientists and staff lead two tree fruit and grape pruning workshops in March. Also in cooperation with Cooperative Extension, WCRC scientists provided training at the annual commercial pesticide applicators workshop in February.

In late winter and early spring of 2004, WCRC - Rogers

Mesa hosted a series of brown bag lunch seminars covering forages, pest management, irrigation, and soil science, and this site also hosted the grape growers brown bag lunch series where growers have the opportunity to ask WCRC scientists viticulture related questions pertaining to their operations. The grape grower brown bag lunch program takes place on the 2nd and 4th Wednesday of the month beginning in May and concluding in October. In addition to programs and interaction with growers, WCRC scientists and staff also support the industry by meeting with and hosting agencies such as the Colorado Foundation for Water Education, the Gerber sponsored EPA tour of the Colorado fruit industry, and the USDA Risk Management Agency responsible for crop insurance in Colorado. Such meetings provide an opportunity for information transfer and education between different agriculture related agencies, WCRC, and members of the west slope agricultural community.

This fall, WCRC hosted seminars and a viticulture program planning meeting as part of Colorado Mountain Winefest. Recently, WCRC - Fruita hosted an alumni function whereby WCRC personnel and CSU graduates on the west slope spoke to high school seniors regarding the types of career opportunities available in agriculture. A workshop on environmental restoration hosted by WCRC in late October is described elsewhere in this edition of Western Phytoworks.

Some of the events already being planned for 2005 include a hay production workshop and Master Gardener training and pruning workshops, both in conjunction with Cooperative Extension, and a series of brown bag seminars on a variety of topics to be conducted during winter 2004-05. One of the best ways to stay informed on the availability of these types of programs is to frequently check the WCRC website (www.colostate.edu/programs/wcrc) and click on our “Upcoming Events” tab to see what events are scheduled. For more information on this article, contact Frank Kelsey (frank.kelsey@colostate.edu).



John Wilhelm demonstrates Peach Pruning.

New Weigh Bin Designed and Constructed at WCRC

Each year field experiments are conducted off-station at various locations around western Colorado by WCRC researcher Dr. Calvin Pearson. Some of these studies require harvesting field plots using farmer-cooperator equipment. Collecting yield data from commercial scale combines and other harvest equipment can be challenging. Furthermore, off-station plot harvesting often requires considerable labor to complete plot harvest efficiently and without slowing the harvest operations of cooperators on the rest of their farm.

For many years, a spring scale and large round tub were used when weighing corn grain harvested from small field plots. Handling a tub full of grain required two stout people and a third person was needed to record data and manage subsamples collected for grain moisture and quality determinations.

To improve both labor efficiencies and data collection, a new weigh bin was designed and constructed this summer at the Western Colorado Research Center at Fruita. The square weigh bin is made of 16-gauge steel and measures 24 inches by 24 inches with a 12-inch bin depth. A quick release trap door in the bottom of the bin allows for easy and fast bin dumping. Two sides of the bin slope toward the door and promote fast and complete cleanout when the bin is emptying.

The weigh bin has been fitted with an electronic weighing system from Cardinal Scale Manufacturing Co. (Webb City, MO) and includes a 1,000-lb capacity load cell and readout (Model 728 Digital Indicator) constructed of stainless steel with ½-inch high red LED readout numbers. The load cell and weigh bin hang from an 8-foot length of 2 by 2-inch steel tubing. The tubing spans the grain tank and provides solid support for the load cell and weigh bin.

Four support rods are attached to the weigh bin and angle upward to where they come together and hook onto the load cell. The two support rods on the same side of the weigh bin are attached to each other and hinged. Thus, the support rods can be easily lifted off the load cell hook and because they are hinged the support rods fold down into the interior of the box to allow for convenient transport of the weigh box.

A deflector shield attaches to the two support arms that are opposite from the clean grain auger (not shown in photo). As grain comes out of the clean grain auger the deflector shield keeps grain from spilling out of the weigh bin. A 12-volt motorcycle battery powers the weighing system and a convenient carrying rack with handle holds both the readout and battery.

The “old” spring scale could be read to the nearest half pound while the digital readout has been set to read to the nearest tenth of a pound. The electronic weighing system will improve the data obtained from farmer-cooperator field research.

The weigh bin was designed to be as lightweight as possible, but is still sturdy and can readily accommodate plots

yielding more than 100 lbs of grain. The overall weight of the weigh bin, not including the electronic weighing system and support tubing, is 48 lbs. The weigh bin has two handles on the sides for carrying and to make setup on the combine easy and fast.

This weighing system reduces the labor requirement from three to two people. One person operates the weigh bin and the other person records data and manages the subsamples. This new weighing system can be operated safely and efficiently inside the grain tank of commercial combines in a manner that has been previously accomplished over the years with the old system.

The cost of the electronic weighing system was \$700 and construction materials (not including labor costs) for the weigh bin were \$110. Design and construction of the weigh bin was a joint effort by Research Agronomist Calvin Pearson and Research Associate Lot Robinson. For more information about this piece of equipment, contact Calvin Pearson at calvin.pearson@colostate.edu.



Lot Robinson operating the weigh bin inside the grain tank of a commercial combine.

Rogers Mesa Cameo and Honeycrisp Update

The Western Colorado Research Center’s Rogers Mesa site has some newer apple plantings now in their fourth leaf. The two varieties planted are Cameo and Honeycrisp, both on M26 rootstock. Half of these plantings are managed conventionally and half are managed under organic standards. All the trees are on a three wire trellis and trained to a modified french axe system. The irrigation method for both the plantings is hanging microsprinklers. Weed control in the conventional block is accomplished with herbicides to maintain a five foot wide weed free strip. The organic block was grown with ground cloth providing a five foot wide weed free strip for the first three years. The cloth has now been removed and the weeds are controlled with thermal techniques.

The Cameo variety has proven to be the more vigorous in