

New Regional Water Management Specialist Hired for Western Colorado

Denis Reich has been hired by CSU to be the regional water management specialist in western Colorado. Filling this position has been the aspiration of many people for many years and we are delighted Denis has been selected to fill the position. Denis comes from Iowa State University where he has been working as a Research Technician for the past 3 years on biomass and alternative cropping systems. He begins his work at CSU in early January 2008. His office will be located at the Western Colorado Research Center at Fruita. His work address will be:

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Some of Denis's duties will include:

- Serve as a knowledge expert in the area of water use, issues, and practices.
- Serve as a knowledge expert in the area of efficient urban water use and management.
- Provide water resource education to Extension Agents and other CSU personnel.
- Provide broad water outreach education covering both agriculture and urban audiences.
- Work with other private and public entities to enhance collaboration and communication among these entities.
- Collaborate with Agricultural Experiment Station researchers to enhance effectiveness and visibility of applied water-related research.

Please join us in welcoming Denis to western Colorado. We wish him the best as he begins his new job with CSU.

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



WCRC Hosts Annual Meeting of National/International Fruit Tree Rootstock and Breeder Horticulturists

The Western Colorado Research Center hosted the annual meeting of the NC-140 and the NECC-1009 Regional Research Coordinating Committees consisting of horticultural scientists coordinating international trials of fruit tree rootstocks and varieties on Nov. 11 - 14, 2007. The group of 27 scientists included participants from the U.S., Mexico, and China. Plans were made for new rootstock trials for apple, peach, and tart sweet cherry to be planted in 2009 and pears possibly in 2010. Colorado is planning to participate in the 2009 apple and the peach trials and the 2010 pear trial if it comes to pass. Colorado currently has no active NC-140 trials as the 2001 and 2002 peach trials were removed at the direction of the study coordinators in late fall 2006.

The participants expressed their appreciation for being able to meet in Colorado as it provided new perspectives on the industry and climate in Colorado. And it provided opportunity for greater input from Colorado growers and participants in the planning for future trials.

For more information contact Dr. Harold Larsen at harold.larsen@colostate.edu

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NC-140 horticultural scientists at WCRC – Orchard Mesa, Nov. 12, 2007.

A Diversity of Tours and Visitors This Summer at WCRC

Over the years, we have hosted a wide variety of tours and visitors at the Western Colorado Research Center (WCRC). This year was no exception. Several groups and visitors came to WCRC this summer.

On June 12, 2007 Dr. Ron Godin hosted 22 interns at WCRC–Rogers Mesa. As part of their internship, this group worked with local organic farmers.

On June 27, 2006 a group sponsored by the Colorado Foundation for Water Education toured WCRC–Rogers Mesa. The 40 participants included state and local policy makers and politicians as well as members of state and local water organizations and the Delta County office of the National Resource Conservation Service. WCRC faculty and staff shared current water research and use practices at Rogers Mesa as well as plans for the upcoming irrigation system upgrade scheduled for this winter.

We invited a select group of people to participate in an afternoon tour at WCRC–Fruita on July 17, 2007. The tour was organized to provide politicians, community leaders, and conservation district and agency personnel with an opportunity to see first-hand current research at the center and discuss issues and topics of importance to agriculture in western Colorado. Many excellent questions were asked and valuable discussions ensued during the tour. Keeping our stakeholders informed about our current research activities is important.

August 2, 2007, WCRC–Orchard Mesa was the location for a visit by CSU President Larry Penley with local CSU employees with CSU agencies, including WCRC, Extension, and Forest Service. Following a luncheon, there was a question and answer session with President Penley.

On August 15, 2007, we hosted a tour at WCRC that was organized by CSU Extension for people around the state who were interested in water quality issues in Colorado. The tour began in Fort Collins and over three days they met and toured a number of facilities and projects. The tour included two stops



July 17, 2007 tour of Western Colorado Research Center—Fruita.

at WCRC- one at Fruita and another one at Rogers Mesa.

On July 24, 2007, Dr. Harold Larsen hosted a tour at WCRC–Orchard Mesa for 17 members of Governor Owens' Budget Committee. He provided an overview and background information on the CSU grape project and the fruit research program.

On September 6, 2007, approximately 100 people who were attending the Plant Community Restoration Workshop toured a seed production field area of several native plant species at WCRC–Rogers Mesa. Dr. Ron Godin gave an overview of his work with this activity.

On September 19, 2007 an energetic group of people from the Newcomers Group in Grand Junction toured WCRC–Fruita. Current on-station research was described by Dr. Calvin Pearson. The Newcomers Group showed keen interest in western Colorado agriculture and the agricultural research we are conducting at WCRC. Following the tour they ate a catered lunch at the research center on picnic tables under the large cottonwood tree on the lawn.

On October 10, 2007, 15 CSU Environmental Science students visited WCRC–Rogers Mesa. Dr. Ron Godin hosted and shared insights on his work with native plants and environmental restoration through the Uncompaghe Plateau Project.

We enjoy hosting tours from all types of groups, both large and small, and we find this is a great way for us at WCRC to stay connected with our stakeholders and the public. If you are interested in learning more about who we are and what we do, contact us and make arrangements to visit any one of the centers at WCRC.

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

WCRC Reports Daily Weather Observations to National Weather Service Since 1963

WCRC – Orchard Mesa researchers and staff have faithfully reported daily weather observations to the National Weather Service (NWS) since the Orchard Mesa facility was established in spring of 1963. Harold Larsen assumed responsibility for these reports in summer of 1992 and was recognized by the NWS in November, 2007 for 15 years of continuous reporting. Prior reporters for WCRC – OM were Harold Weimer (1963 – 1980) and Rocky Renquist (1980 – 1992), with substantial help from other station personnel over

the entire 44 year period.

The data collected is available within the National Oceanic and Atmospheric Administration (NOAA) database and through the publication "Colorado Climate" found in many libraries. The Orchard Mesa station data is found under the "Colorado River Drainage" as station number GJ6ESE. The dataset is unique in that it includes evaporation pan data during the irrigation season in addition to the usual temperature highs & lows, precipitation, and wind run data. The evaporation pan is one of the few located between Denver and Salt Lake City. The dataset can be accessed through the NOAA website, <http://www.ncdc.noaa.gov/oa/ncdc.html>. Look on the left side of the page for the link to "Data & Products." The Orchard Mesa site also has electronic weather station (datalogger) data that goes back to around 1980 and continues through the present. That data as of January 2007 is now included on the Colorado Agricultural Meteorological Network (CoAgMet) under station ID "ORM01" and can be accessed at the following internet site: <http://ccc.atmos.colostate.edu/%7Ecoagmet/>

Weather data collected includes temperature (max / min / ave), precipitation, wind (wind run, wind speed, wind direction; hourly & daily wind gust speed, direction, & time), relative humidity, vapor pressure, solar radiation, soil temperatures (2", 6", & 18" depth). This data is archived by WCRC and by CoAgMet (historical data prior to 2007 still to be sent to CoAgMet for incorporation in their archives) and available upon request and by arrangement. Similar data is collected at the other two WCRC sites in Fruita and on Rogers Mesa near Hotchkiss. These stations also are part of CoAgMet; their station ID's are "FRT02" and "HOT01", respectively.

The data has been used by CSU researchers (campus and WCRC) as part of research and outreach efforts; the MultiPest Degree Day calculator output that is reported through the FruitFacts and on our WCRC website is based on weather data collected at CoAgMet sites. Other users of the data include the National Weather Service, the water engineers with the National Resource Conservation Service (NRCS) in both Mesa and Delta Counties, the Crop Insurance Corporation, etc.

One additional weather data network is based at the WCRC – Orchard Mesa site. That is the RMAVV Weather Station Network for vineyard crops. It can be accessed at the following web address: <http://www.rmavv.org/weather.php>.

This radio-telemetry network was established through a Colorado Specialty Crops grant to RMAVV, expanded through a grant from the Environmental Protection Agency (EPA), and maintained by RMAVV. It provides real-time (15 min.) updates to the industry on-line for eight locations from the East end of the Grand Valley (Palisade & East Orchard Mesa) to west central Orchard Mesa to 22 Road on the West and South to the Redlands. Data reported includes temperatures, precipitation, wind speed & direction, solar radiation, relative humidity, and leaf wetness. The data is incorporated into computer models that track and identify potential powdery mildew disease risk for grape growers. It also includes a temperature probe at the top of a 50 ft. weather tower that provides temperature inversion data at the Orchard Mesa site. Dr. Caspari is the primary WCRC researcher maintaining the network.

For more information contact Dr. Harold Larsen at harold.larsen@colostate.edu



Harold Larsen with 15 year award from National Weather Service, Nov. 2007.

Natural and Bio-fumigants: Potential Options for Disease Management in Western Colorado.

Soil-borne pathogens (fungi, nematode and bacteria) are constant threats to crop production. They are also common and important to western Colorado fruit growers as they cause "Replant disease" in stone fruits. The disease reduces the vigor and productivity of the orchard planted in the same field after another stone fruit.

Methyl bromide, which worked very well to mitigate the soil-borne diseases, is no longer available to growers. However, alternative soil fumigants such as methyl iodide, chloropicrin and MIDAS 33 and MIDAS 98 were found to be effective to manage this disease, if applied properly. However, they are not environmentally friendly and also are not acceptable to many organic growers whose numbers are increasing

in western Colorado. There currently is no management option for organic fruit producers to this disease which also increases susceptibility to pests, diseases and nutritional imbalances. Thus, a search for environmentally friendly management options especially targeted to the organic growers was initiated. Bio-fumigation (soil solarization) and bio-pesticides (e.g., isothiocyanate from *Brassica* crops) could be potential alternatives for both organic and conventional growers. Preliminary observations indicated that *Brassica* crops can be grown successfully in western Colorado.

Soil solarization is a very simple process of heating soil by solar heat to a sub-lethal level for a period of time to inactivate/kill soil borne pathogens. Moist, loose soil is covered and sealed with plastic to provide an airtight environment (Fig 1). Adequate moisture is critical to the process because it absorbs and holds the solar heat, allowing soil temperature to reach and maintain the necessary levels to be affective. The time required depends on the temperature attained; the higher the temperature, the shorter the time needed. At 95° F, it would require 48 days.

In 2007, solarization at the Western Colorado Research Center raised the soil temperature to greater than 95° F (maximum of 108° F) for nearly 12 weeks between mid-June to and mid-September (Figure 2). In addition to this, an observed 90% decrease in dag-

ger nematode populations compared to non-treated soil clearly demonstrates the potential of soil solarization in western Colorado.

Previous studies elsewhere have shown that soil solarization not only managed the soil-borne diseases, but also it increased the concentration of soluble mineral nutrients such as ammonium- and nitrate-nitrogen. Similarly, it also increased the concentration and availability of other soluble mineral nutrients, including calcium, magnesium, phosphorus, potassium. This helped to improve plant health and growth and thereby reduced the need of chemical fertilization. In addition, it also reduced the weed pressure in solarized soil as compared to non-solarized soil. Incorporation of by-products such as canola meal cake, chicken manure/compost and mustard green manure would help to raise soil temperature further. Tests of canola meal cake, chicken manure and mustard green manures combined with soil solarization are underway at WCRC— Orchard Mesa. In addition, tests of isothiocyanate from different species of *Brassica*, oils from different plant species and some new chemical products are underway and preliminary observations are very encouraging, especially with mustard products.

Preliminary attempts to manage *Cytospora* canker, a devastating disease of stone fruits with no organically certified control currently available, by using these mustard products and some other oil-based products have provided encouraging results. Cankers treated with these materials appeared to dry up; further studies to confirm these results are in progress.



Fig 1: Covering soil with plastic and sealing all the sides, is a simple way of heating soil inside plastic.

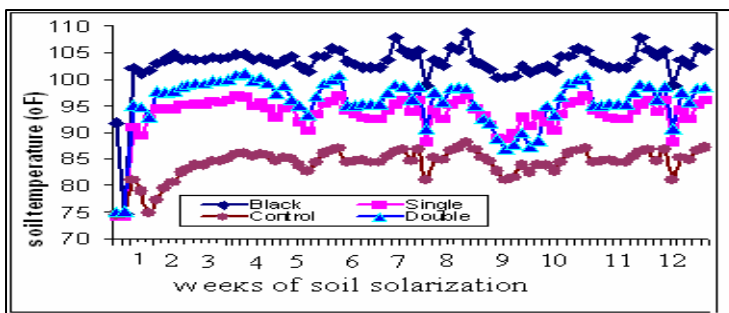


Fig 2: Comparison of soil temperature at 6" depth from June 19th to Sep 15, 2007 at Orchard Mesa Research Center under black plastic, a single layer of white, a double layer of white plastic (all plastic 6 mm thick), and in a non-covered plot.

WCRC Employees Participate in Bike-To-Work Day

Several employees at WCRC–Fruita participated in Bike-To-Work Day on June 27, 2007 by biking to and from work at Fruita. Fred Judson biked the farthest from his home in Palisade, covering a round trip distance of 50 miles. Others biked a lesser distance coming from Grand Junction, covering a round trip distance of 25 to 35 miles. Although the bike ride was more work for some than for other more experienced bicyclists, we all had a good time on that hot summer day!

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



Picture from left to right are Chip Brazelton, Fred Judson, Calvin Pearson, and Daniel Daw-