

# Western PhytoWorks

**Western Colorado Research Center**

**Fall 2006**

**WCRC Personnel Changes in 2005-06**

Several significant changes in WCRC personnel occurred in 2005 and 2006 that need to be shared with our readers. Frank Kelsey, our second WCRC Manager, and Lot Robinson, a Research Associate at Fruita, both submitted their resignations in Aug. - Sept., 2005. Frank took another job with industry, but remains in Grand Junction and has been added to the WCRC Advisory Committee. Lot took a different job with the energy industry. Finally, in 2005, Dr. Joe Brummer moved to the CSU main campus and the Dept. of Soil and Crop Science and, in 2006, Dr. Matthew Rogoyski moved to transitional retirement. The past contributions of each of these former co-workers is acknowledged and appreciated. Continued collaboration by Frank and Joe are anticipated in the years ahead, although in slightly different capacities than before.

The Manager vacancy at WCRC was filled on an interim basis as of Jan. 1, 2006 by myself (Harold Larsen, fruit pathologist at Orchard Mesa) for a three year term (to conclude with my retirement in 2009). That shift in responsibilities necessitated hiring of a new Research Associate to cover my research and Extension responsibilities. Dr. Ramesh Pokharel joined us in early August, 2006 to assume those duties.

Ramesh was born in Nepal, has his B.S. in Plant Protection from Haryana Agricultural University in India (1980), his M.S. in Plant Pathology from the University of the Philippines (1991), and just completed his Ph.D. in Plant Pathology at Cornell University (2006). He taught college in Nepal, worked as an Extension plant pathologist, collaborated on various research projects as a plant pathologist/nematologist, and worked as a Research Associate at Cornell while doing his Ph. D. studies there. He is a basic plant pathologist by training with focus on plant parasitic nematodes, but has broad interests and experience in integrated plant management and soil health issues. He and his wife, Parbati, have two children and enjoy outdoor activities and traveling. He has been hard at work since his arrival looking at nematode involvement in replant situations for tree fruits and in the NC-140 fruit rootstock study blocks. We look forward to his contributions to our research and outreach program.

John "Chip" Brazelton joined WCRC as a Temporary Research Associate at the WCRC-Fruita site in Sept., 2005. His duties include many of those previously covered by Lot Robinson while the Agricultural Experiment Station considers what to do with the position previously held by Lot. Chip has extensive farming and administrative experience in Texas and has done an excellent job helping out at Fruita.

The 2005 calendar year also saw the move of Joe Brummer to campus to teach forage science courses in the Department of Soil and Crop Science and serve as the State

Extension Specialist for forage crops. Joe continues to work with WCRC researchers on research projects, doing so from his campus "home base." We are glad that relationship continues, even on a long-distance basis.

On August 1, 2006 horticulturist/pomologist Dr. Matthew Rogoyski moved to transitional, half-time retirement in order to provide personal care for his mother; the duration of his transitional period will be between one and four years. His absence leaves a temporary hole in the Horticultural research program at WCRC.

Finally, our Accounting Tech Susan Baker was promoted to Accounting Tech III in July. Our congratulations to Susan!

For more information contact Dr. Harold Larsen at [harold.larsen@colostate.edu](mailto:harold.larsen@colostate.edu) or 970-434-3264 ext 205.

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<p>Western PhytoWorks is a publication of the CSU Western Colorado Research Center, 3168 B 1/2 Road, Grand Junction, CO 81503-9621.</p> <p><i>Editor: Dr. Ron Godin</i></p> <p><i>The information in this newsletter is not copyrighted and may be distributed freely. Please give the original author credit for their work.</i></p> <p>Direct questions and comments to:            Susan E. Baker            Phone: 970-434-3264, Ext. 201            Fax: 970-434-1035            E-mail: <a href="mailto:susan.baker@colostate.edu">susan.baker@colostate.edu</a></p>	

**WCRC Researcher Presents Paper at Scientific Meetings in San Diego**

Dr. Calvin Pearson, Research Agronomist with the Agricultural Experiment Station at WCRC at Fruita with an appointment as Professor in the Dept. of Soil & Crop Sciences at Colorado State University, presented a scientific paper at the Association for the Advancement of Industrial Crops (AAIC) meetings held in San Diego, CA on October 14-18, 2006. The title of his paper was "Transforming Sunflower into a Rubber-Producing Crop." Dr. Pearson was among many researchers and industry representatives who came together to share

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information on the importance of industrial crops. This scientific meeting, sponsored by AAIC and other professional and scientific societies, was the Sixth New Crops Symposium.



The meeting was titled "Creating Markets for Economic Development of New Crops and New Uses."

AAIC is an international, nonprofit educational and scientific organization established; 1) to promote the production, processing, development, and commercialization of industrial crops and products derived from industrial crops; 2) to educate people through national and international meetings and conferences about industrial crops; and 3) to provide the public, industry, and government policy makers with expert scientific, engineering, and business information on developments in the utilization and commercialization of industrial products from agricultural crops.

Presentations at the meetings in San Diego were organized into sessions for bioproducts and bioenergy, industrial crops, specialty crops, botanicals and medicinals, ornamentals, oilseeds, and latex, rubber, and resin, among others. Two speakers highlighted the meetings. Dr. Tom Dorr, USDA Under Secretary for Rural Development was the reception speaker and spoke on the topic of "Linking Research to Commercialization." Dr. Gale Buchanan, USDA Under Secretary for Research, Education, and Economics, gave the keynote address on the topic of "New Directions for Research – Bioenergy and Biobased Products."

All the presentations at the AAIC meetings were very informative and timely. Attendees came away from the meetings with a clearer understanding of the powerful research and cutting edge technology to create a sustainable society and an economy based on biology and agriculture to replace an economy so dependent on petroleum.

For more information about this article contact Dr. Calvin Pearson at [calvin.pearson@colostate.edu](mailto:calvin.pearson@colostate.edu).

### **EPA Grant Awarded to Investigate the Role of Trap Crops to Control Beet Leafhopper and the Transmission of Beet Curly Top Virus**

In recent years, beet curly top virus (BCTV) has caused significant losses in commercial tomato plantings in western and southeastern Colorado. In the past few years some commercial tomato growers in the western Colorado counties of Mesa and Delta have lost an estimated 50000 plants in a single growing season to beet curly top virus. The virus has been observed to affect both hybrid and open-pollinated tomato varieties. In addition to tomatoes, BCTV has been observed to cause damage in winter squash, sweet peppers and chili peppers. Beet curly top virus has been reported to cause significant losses in pepper crops in New Mexico. Beet curly top has also been observed to infect other crops such as beans, potatoes, cabbage and alfalfa.

The symptoms expressed by BCTV will depend on the host plant. Most common symptoms in tomatoes include leaf and fruit distortion and plant stunting. Leaves on tomato plants will typically twist and curl upwards. The twist and curling is

followed by a yellowing of the leaves and purpling of the veins. The leaves may also become thickened. The tomatoes will also ripen prematurely and have a mealy texture. Infected seedlings may also be killed by the virus.

BCTV is common in arid and semi-arid regions from Mexico to Canada. BCTV has a broad host range, including over 300 species in 44 plant families. These families included many common weed species such as mustards, filaree, mallow, bindweed, broadleafed plantain, gum plant and dandelion. The only known vector of BCTV in the western United States is the beet leafhopper, *Circulifer tenellus* (Baker). Both BCTV and



beet leafhopper were introduced from the Mediterranean region of southern Europe. Beet leafhoppers which are infected with BCTV can transmit the virus to a plant within one minute after

beginning to feed. The rapid transmission of the BCTV to the host plant complicates the prevention of the infection of the plant. Insecticides have proven to be ineffective at preventing transmission of the virus. Plant breeders have also reported inconsistent results from supposedly BCTV resistant varieties of tomatoes. In 2005, five varieties of tomatoes which were bred for resistance to BCTV were evaluated near Grand Junction, Colorado. All five varieties succumbed to BCTV.

This study proposes to determine if trap crops in combination with systemic and foliar insecticides can eliminate or reduce the infection and subsequent loss of tomato plants to BCTV. This study will use a border and within-field strips of sugar beets and mustard plants which are highly attractive to the beet leafhopper as trap crops. The trap crop will be treated with a systemic and a foliar application of insecticides killing the beet leafhoppers before they have the opportunity to move to the tomato plants.

The EPA awarded \$37,770 for the two year investigation. Work will begin in 2007 and will be conducted at sites in Delta and Mesa Counties.

For more information contact Dr. Rick Zimmerman at the Rogers Mesa Research Center. (970-872-3387) or Rick. Zimmerman@ColoState.Edu.

## Producing Canola and Biodiesel on the Western Slope

Biodiesel has recently attracted interest because of the increasingly high cost of petroleum diesel. Biodiesel has similar properties, can improve air quality, and is safer to handle than petroleum diesel. Several oilseed crops, including canola, are suitable for biodiesel production. Canola is a desirable source of vegetable oil because of its high seed oil content (40-45%).

There is an effort underway to build a biodiesel production facility in southwest Colorado by the San Juan Biodiesel Cooperative. A feasibility study for the project has been completed and other various activities are being conducted including a capital funding-raising campaign. Construction of the biodiesel production facility is anticipated in the near future. Successful completion of such a facility would open up the possibility of growing canola, along with other suitable crops, in western Colorado to supply vegetable oil for the biodiesel plant.

In 2005 and 2006, yield trials were conducted at the Western Colorado Research Center at Fruita to evaluate canola entries (cultivars and breeding lines) for seed yield and related agronomic characteristics and to assess the potential for commercial production of canola in western Colorado. Canola was fall-planted both years. Plants established well and survived the winter in good condition.

In 2005, plant height of canola entries averaged nearly 64 inches. Plant lodging, across all entries, was quite low at only 8.8% and seed shattering for the twenty-eight canola entries averaged only 1.8%.

The standard test weight value for canola is 50 lbs/bu; however, test weights for the twenty-eight canola entries in 2005 averaged only 36.1 lbs/bu. Test weights ranged from a high of 43.4 lbs/bu for the cultivar Baldur to a low of 29.8 lbs/bu for the cultivar KS3018. A severe infestation of false chinch bugs



occurred during the growing season and could have negatively impacted test weights. Seed moisture content in

2005 averaged across all entries was 6.3%.

Seed yield in 2005 averaged 2323.5 lbs/acre and ranged from a high of 3027.3 lbs/acre for the cultivar Baldur to a low of 1542.8 lbs/acre for the cultivar KS2098. Seed oil content averaged only 35.3%, much lower than is typically produced by canola. Oil contents ranged from a high of 37.3% for the cultivar ARC92007-2 to a low of 32.4% for the cultivar Casino.

The 2006 data are being analyzed and will be available sometime during the winter. Another canola trial was planted on 12 Sept 2006 and will be harvested during summer 2007. Several years of testing are needed to adequately evaluate the potential for growing canola in western Colorado for biodiesel production.

For more information about this article contact Dr. Calvin Pearson at [calvin.pearson@colostate.edu](mailto:calvin.pearson@colostate.edu)

## Enology Position Added to the Wine Grape Program at WCRC

Colorado's rapidly growing grape and wine industry continues to have substantial positive impact statewide, especially in Mesa and Delta counties of western Colorado. Two entities formed to help promote and nurture this emerging sector of Colorado agriculture were the Rocky Mountain Association of Vintners and Viticulturists (RMAVV) and the Colorado Wine Industry Development Board (CWIDB). They have worked with Colorado State University's Dept. of Horticulture and Landscape Architecture (HLA) and the Agricultural Experiment Station (AES) to provide funding for the Colorado State University (CSU) grape program based at the WCRC – Orchard Mesa. The grape program currently is directed by Dr. Horst Caspari (Professor of Viticulture, HLA & WCRC) and involves work by Dr. Harold Larsen (Plant Pathologist &, now, Interim Manager of WCRC), Dr. Rick Zimmerman (Entomologist, Bioag. Sci. & Pest Management [BSPM] and WCRC), and Dr. Ramesh Pokharel (new Plant Pathology Research Associate at WCRC – OM, see associated article in this newsletter). However, work on the impact of vineyard and other factors on the quality of Colorado wines has been limited by the lack of an enologist as part of the research program. That will change with the addition of an enology position at the WCRC in the coming season.

Enology is the science of wine-making. Colorado's grape and wine industry has identified wine-making and the impact of vineyard and other factors on the quality of Colorado wines as an area needing attention. The individual hired to fill the new enology position is to do this by developing an externally-funded program of enology research and extension education/technical assistance that contributes to the growth and vitality of Colorado's emerging wine industry. The appointee is expected to contribute disciplinary expertise in a viticulture/ enology program that is increasingly focused on maximizing the quality of Colorado wine, especially with small-scale enterprises, and to teach enology and mentor student interns in the viticulture/ enology concentration in the undergraduate Horticulture major under development in HLA on campus. The new position will be based at WCRC – Orchard Mesa and will work closely with the others in the Grape Program as well as the industry itself.

Industry's view of the importance of work in this area is indicated by the fact that the CWIDB and RMAVV have committed half of the funds needed to fill this position. CSU will fund the other half of the position. An international search is underway with the hope of having the new enologist on board at WCRC – OM by this coming growing season. The job announcement is available on the HLA website as follows:

<http://hla.agsci.colostate.edu/employment/positions.htm>

## New Research Project Initiated at WCRC on Living Mulches

Using a living mulch in a novel cover cropping system involves growing an annual grain crop that is no-till seeded into an existing plant stand (usually perennial). Kura clover (*Trifolium ambiguum*) is a perennial, rhizomatous plant that has been successfully used in the Midwest as a living mulch in no-till corn production systems. Kura clover can take from 1 to 2 years to establish before a grain crop can be no-till seeded into the stand, but clover has several unique qualities that make it well suited as living mulch. Once established, the clover provides nitrogen to the annual crop, reduces soil erosion, improves overall soil health, survives well under a corn canopy, and can be grazed as forage once the grain crop is removed. This system has not been tested under irrigation where it may also reduce nutrient loading in tailwater coming from furrow-irrigated fields. Because the clover can compete against early growth of the grain crop, it must be suppressed prior to no-till seeding. The objectives of this new research project are to: (1) evaluate methods of suppressing the clover prior to seeding corn, (2) determine nitrogen replacement values of the clover, and (3) compare the living mulch system to conventional corn under irrigation in Colorado. We will be comparing grain and forage yields, water use, and water quality impacts between the living mulch and conventional systems.



This novel cover cropping system study is being conducted at the Western Colorado Research Center at Fruita. In August of 2004, a one acre plot of kura clover was seeded and allowed to fully establish during the 2005 growing season. An area adjacent to this no-till plot area was planted to corn using conventional

clean-till production practices. Treatments to suppress the clover prior to seeding were: (1) broadcast application of Roundup, (2) band application of Roundup, and (3) flaming. Nitrogen replacement values were achieved by applying 0, 150, or 300 lbs N/acre to the plots with kura clover and 0, 150, or 300 lbs N/acre of commercial fertilizer to the conventional corn plots. Composted poultry manure, provided by Grand Mesa Eggs in Fruita, was used as the nitrogen source in the clover plots. Each plot area was furrow irrigated from a different surge valve. A meter was installed at each valve to measure the amount of water applied and a continuous recording flume was installed in the tailwater ditch to measure the amount of runoff from each plot area. Tailwater samples were collected from each plot area over the course of irrigation and analyzed for sediment loads. Harvest of the corn plots will occur sometime during November 2006. This research project is expected to continue for several years in order to fully evaluate how this living mulch cropping system will perform in western Colorado.

This project is a collaborative effort with Drs. Joe Brummer, Neil Hansen, and Calvin Pearson. Drs. Brummer and Hansen are faculty members in the Dept. of Soil & Crop Sciences on campus in Fort Collins and Dr. Pearson is also a faculty member in the same department but is located at WCRC at Fruita and is an employee of the Agricultural Experiment Station.

This study was initiated at Fruita, and as it expands, it will include other locations in Fort Collins and along the Front Range. Some of these other locations will be conducted on-

farm with farmer cooperators. To date, funding for this project has been obtained from the Natural Resources Conservation Service as a Conservation Initiative competitive grant. Also, a small grant was obtained through the USDA-Cooperative State Research, Education, and Extension Service Water Resources Program and the Colorado Agricultural Chemicals and Groundwater Protection Program.

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