In February, 2008, Stephen Menke, Ph.D took the newly created position of Associate Professor of Enology, in the Dept. of Horticulture and Landscape Architecture (HLA) at Western Colorado Research Center (WCRC), and unofficial title of Colorado State Enologist. Partial funding is provided by the Colorado Wine Industry Development Board (CWIDB) and by the Colorado Association for Viticulture and Enology (CAVE). The position charge is 60% Teaching/Outreach/Extension, 30% Research, 10% Departmental Service.

The mission of the Enology position includes: 1) develop collaborative outreach infrastructure in all stakeholders such that an interactive Colorado wine industry development process is enhanced; 2) provide interactive educational and technical expertise for industry brand enhancement, wine quality assessment, and winery business and marketing knowledge; 3) develop research capacity and perform research to enhance knowledge of marketable sensory and chemical characteristics of wines grown in various locations in CO; 4) teach enology courses in HLA and facilitate enology internships; 5) provide CO wine industry perspective and knowledge nationally to peers and public.

During 2008 and 2009, enhanced research capability at WCRC included: a refurbished GC/MS, PCR capabilities, improved water purification, equipment for experimental winemaking, equipment for wet lab assays, and sensory training capability. In 2009, an agreement with the University of Wyoming Animal Science Department allows the use of their sensory testing facility to train panelists for the Colorado Wine Quality Assurance Program. Also in 2009, an agreement with Grand River Winery allows shared space for making CSU experimental wines. A proposal is being developed to establish a CSU experimental-winery partnership.

The goal is to continue the WCRC research with the cooperative efforts of Grand River Winery to continue research and training for the Colorado wine industry.

Western Colorado Research Center
Fall 2009

New CSU Enology Program, 2008 and 2009

A new project on sustainable management of peach soil-borne problems through integrated use of soil solarization, biofungation, and rootstock selection by Dr. Ramesh R. Pokharel was funded by Strategic Agricultural Initiative program of EPA for 2009 to 2011 with the amount of $43,500. This project aims to combine soil radiation, biofungation and selection of rootstocks as an alternative to Methyl Bromide.

Comments

Dr. Pokharel—Project Approval

For pre-arranged comprehensive site visits, times were arranged with the winery personnel to do a 3.5-hour interview with the CSU enologist. Winery owners, winemakers, and other personnel were part of the interview process. Confidential notes were taken by the CSU enologist. A standardized oral interview format was used for all interviews. The interview consisted of four parts: 1) Account of pre-winery personal history, motivations and actions of owners and history of the winery; 2) discussion of the current state of the winery in the eyes of the owners and personnel and desires for the future of the winery; 3) discussion of abilities of CSU enology program and comparison with desires and needs of the wineries; 4) testing of bottled, tanked, and barreled wines with the owners, with confidential tasting notes by CSU enologist. During the interviews, oral critiques were given by the CSU enologist on current practices, products, and winery business operations. Owners and winemakers asked questions and made comments.

Comments:

Dr. Pokharel—Project Approval

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Comments:
Management of Alfalfa Forage Trials Changed

At the Western Colorado Research Center at Fruita we have been conducting commercial alfalfa variety performance trials since at least the early 1980s. Harvesting alfalfa trials was very labor intensive. The forage in the plot area was cut mechanically, often using a tractor and pull-type swather. The plant material was then gathered and forked onto a tarp, and weighed by hanging the tarp and plant material on a spring scale (Photo A). This plot harvesting system required 4 to 5 sturdy people and a lot of manual labor to harvest as many as 70 plots in a day. By the end of the day after harvesting alfalfa plots all the workers were very tired.

In 1993, we designed and fabricated an automated forage plot harvester using a field-scale commercial swather (Pearson and Robinson, 1994). This automated plot harvesting system was a major improvement, was much faster, and required much less physical exertion over the earlier method. The new forage plot harvester allowed us to conduct considerably more forage research. We used this harvesting system for many years and would often comment during harvest how much better it was than the way we used to harvest forage plots in the “old” days. However, this harvesting system still required three workers to harvest one plot. Therefore, we made an even greater effort to improve the system, and in 2006, we designed and fabricated an updated, very fast, and efficient forage plot harvesting system using a field-scale commercial swather that we call an automated commercial swather for harvesting forage plots. Agron. J. 86:1131-1133.

In 2006, we designed and fabricated an updated, version of the automated commercial swather (Pearson, 2007; Photo B). This latest version was another major improvement in harvesting forage plots.

The new version requires only two people, depending on the experiment and the amount of data and sample collection. For many trials, one person operates the swather and the plot weighing system and electronics, and another person walks along the swather to make sure things are operating properly. With this new system, we can readily harvest several hundred plots in one day without wearing out the workers.

In 2009, we changed the way we manage alfalfa once it has been harvested. We used to dry the alfalfa, bail it, and re-move the bales from the field with a tractor and bail wagon. Making hay required several days of drying time followed by several field operations including raking, baling, and hauling. When making hay, the time from cutting to when the field was irrigated for the next cutting took 7 to 10 days. Haymaking required several trips across the field and plot area, and if it rained there were longer delays between harvest and irrigating the field for the next regrowth. Additionally, alfalfa under went a window was slow to regrow compared to the rest of the field. This meant uneven regrowth and hence variability in plant growth across the field and plots. Wheel traffic from all the equipment also created variability and uneven regrowth in the field and to some extent in the plot area where we could not avoid driving over the plots.

We no longer bale the swathed alfalfa. Once the plots are harvested, the alfalfa is green chopped (Photo C) and trucked to a feedlot operation several miles away in the Loma area.

In 2006, we designed and fabricated a swather for harvesting forage plots. With the plot harvesting system and green chopping we used during 2009, all of our plots can be harvested, the alfalfa from the plots and fields removed, and the alfalfa fields irrigated within 3-4 days of swathing.

Results of our commercial alfalfa forage performance trials are posted on the Internet after each cutting. This information is available at www.csucrops.com.

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


 Western phytoworks

Monitoring weather and mildews helps avoid developing resistance mildew race

Prevailing weather conditions help to grow better fruit crops with low incidence and severity of pests and diseases in western Colorado. The incidence and severity of powdery mildew have been increasing in recent years, probably because of suitable temperatures and relative humidity (RH). Precipitation and/or irrigation, especially with micro sprinkler systems, can lead to higher RH and rapid outbreaks of powdery mildew in a particular orchard when the average daily temperatures are favorable for optimal conditions. Once powdery mildew becomes visible 48 hours after infections; new infections produce spores in about five days. Unlike other foliar diseases, leaf wetting is NOT a requirement for powdery mildew infection. Increasing incidence and severity of powdery mildew demand more pesticide use and thereby increase the risk of developing pesticide resistance in powdery mildew populations. However, recent efforts to establish weather stations, monitor weather, and educate growers on mildew outbreaks have helped to manage powdery mildew and reduce the pesticide use in western Colorado.

In western Colorado, daily temperatures are normally within the required ranges for powdery mildew infection during the crop growing season. Higher RH in different growing seasons when the crop was associated with rain events (scattered up to April 4; April 11-13 and continuous rainy weather from April 20-28) during the 2009 growing season. However, the irrigation water and type,component of powdery mildew species, produce macro and micro spores, are a potential source of RH. Information on the impact of irrigation methods to orchard RH and the prevailing species of powdery mildews in different crops in Colorado is limited. We have recently initiated work on this need.

Currently the impact of powdery mildews in western Colorado is partially understood, primarily for apple, pear, and cherry. The apple powdery mildew, Podosphaera leucotricha, on apple, pear, and the peach causing Rusty spot on peach and nectarine. Although the powdery mildew on cherry and apricot is clearly of Podosphaera leucotricha, the disease has been recognized as a problem for decades, the sporadic incidence has made control difficult. Recent increases in the incidence of the rose mildew, Sphaerotheca pannosa, on peach and nectarine has caused problems for some growers. Thus, our initiation of monitoring mildew incidence and their types in pome and stone fruits in western Colorado is intended to help growers manage the disease more efficiently. The ongoing monitoring of weather data and overwinters mildew fungus and the forecasting of spray schedules have helped to successfully reduce the use of chemicals. Growers’ education to minimize repeated use of same chemistry has helped avoid developing a resistant population of powdery mildew.

The hazelnut powdery mildew (Podosphaera clandestina) is the primary mildew on cherry, but is also reported on peach, apricot, apple, pear, quince, persimmon, and a few ornamental plants. White powdery mildew species cover the leaves (Figure A) and the fruits (Figure B). Apple Powdery Mildew caused by the fungus Podosphaera leucotricha infects shoots and leaves in apple and causes Rusty Spot in peaches (Figures C and D). Often peach fuzz in such infections remains intact, but in severe infection the fuzz is removed (Figure D). Rose mildew infection produces light brown circular spots surrounded by white margins (Figure E). Young peach and nectarine shoots and fruits are susceptible to infection from early stage of development to pit hardening. Fruit infection is important as it decreases marketability and increases fruit cullage.

Powdery mildew overwinters in mycelium in dormant buds (apple mildew) or in inner bud scales of peach or dormant infected rose buds (Rose mildews). In cherry, this fungus overwinters in cleistothecia (Figure F) on leaf litter on the orchard floor and is trapped in tree crotches or bark crevices; powdery mildew species can’t be differentiated in infections until cleistothecia are produced. Ascospores are released from the cleistothecia in response to rain or irrigation and provide the primary or first inoculum that infects cherry leaves or shoots in the spring. In Washington, ascospore release was found to begin one month before bud break, and continued until after bloom.

In western Colorado, cherry powdery mildew is commonly observed in cherry, but its incidence in peach has not been recorded. In Utah and other parts of the nation this disease is important in tart cherry. The rose mildew rarely produces cleistothecia in peach, but recently has been observed in peaches in California. We have started monitoring the mildew outbreaks in western Colorado. Increased grower education on the efficient mildew management is important to avoid developing resistant populations of powdery mildew more efficiently. The ongoing monitoring of weather data and overwinters mildew fungus and the forecasting of spray schedules have helped to successfully reduce the use of chemicals. Growers’ education to minimize repeated use of same chemistry has helped avoid developing a resistant population of powdery mildew.

For more information about this article contact Dr. Ramesh Pokharel at ramesh.pokharel@colostate.edu.