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Comments *(cont)*

Only six of the 49 wineries visited appeared to be fully self-supporting. The rest were being partly supported by non-winery income. Despite this, most wineries felt optimistic about their future economic viability, but think it will be a slow process. Impediments include: isolation from potential customers, lack of capital for expansion, insufficient marketing expertise, insufficient control of inventory fluctuations, unease about generational transfer of winery quality. Almost all wineries stressed that they felt the CSU Enology Program would be of greatest benefit to them in helping improve product technical quality, in identifying marketing niches, and in providing outreach education in all aspects of the industry needs.

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

Colorado Wine Quality Assessment

Sites Assessed N = 49	Bottled Wine Quality Category	Bottled Wines Assessed N = 277	Barrel/Tank Wine Quality Category	Barrel/Tank Wines Assessed N = 146	Wine Fault Identified	Wines with one or more Identified Faults N = 69
	Outstanding	3	Excellent Potential	33	Oxidation	37
	Excellent	18	Good to Average	69	Volatile Acidity	22
	Near Excellent	42	Below Average and Not Flawed	19	Reduced sulfurs	17
	Good	76	Flawed but Redeemable	20	Excess SO_2	9
	Average and Sound	27	Faulty and Not Redeemable	5	Microorganism generated odors	10
	Below Average and Sound	67				
	Flawed and Salable	31				
	Faulty and Not Salable	13				

Dr. Pokharel-Project Approval

A new project on sustainable management of peach soil-borne problems through integrated use of soil solarization, biofumigation 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, biofumigation and selection of rootstocks as an alternative to Methyl Bromide.

Colorado State University

Western PhytoWorks

Western Colorado Research Center

Fall 2009

New CSU Enology Program, 2008 and 2009

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 among 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 re-furbished 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 Grande River Winery allows shared space for making CSU experimental wines. A proposal is being developed to establish a CSU experimental/ commercial winery license as part of a shared premises winery with Grand River Winery

Colorado Winery Baseline Survey Assessment

An intensive project in 2008 and 2009 was a preliminary survey assessment of the wineries in the Colorado wine industry. On-site pre-arranged comprehensive interviews were done for part of the wineries. On-site unannounced tastings were also done at tasting rooms of other wineries. The methodology of each differed. For unannounced tastings, the CSU enologist showed up at winery tasting rooms during regular business hours, did not identify himself, tasted all of the wines available for sale, made tasting notes on the wines, and made snapshot observations on the operation of the tasting room at the time.

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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:

Common positive wine attributes included: good fruit intensity and color, intensity of tannin structure, appropriate mouth-feel, and good initial presentation of aromas and flavors. Common wine attributes in need of improvement included: either overripe or unripe aromas and flavors, lack of middle palate fruit, imbalance of fruit and acidity intensities, inconsistent finish.

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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 1960s. 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 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 to four people to harvest forage plots and still required a significant amount of hand labor.

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, bale it, and remove the bales from the field with a tractor and bale 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 underneath a windrow 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 when 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.

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.pearson@colostate.edu.

Pearson, C.H. 2007. An updated, automated commercial swather for harvesting forage plots. Agron. J. 99:1382-1388.

Pearson, C.H., and L. Robinson. 1994. Automating a commercial swather for harvesting forage plots. Agron. J. 86:1131-1133.

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 sprinklers lead to higher RH and rapid outbreaks of powdery mildew in a particular orchard when the average daily temperatures are favorable for mildews. Under optimum conditions, 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 often within the required ranges for powdery mildew infection during the crop growing season. Higher RH in different growing seasons of 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, especially the micro sprinklers, 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. This is mostly for 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 caused primarily by *Podosphaera clandestina* 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 overwintering 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 hawthorn 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 patches 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 margin (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 population since the incidence and severity of the powdery mildew infestions appear to be increasing.

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