HEALTHY FOOD SYSTEMS • HEALTHY ENVIRONMENTS • HEALTHY COMMUNITIES • HEALTHY CALIFORNIANS

University of California
Agriculture and Natural Resources
Making a Difference for California
Cooperative Extension Sutter-Yuba Counties

Orchard Notes

February 2011

This Issue

Submitted by:

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Sutter-Yuba Counties

Sutter-Yuba-Colusa

Walnut Day

Thursday, February 24, 2011
1:00 p.m. – 4:00 p.m.
Veterans Memorial Hall, Yuba City

12:30 p.m. **Registration**

1:00 p.m. **Welcome and Moderator,** *Janine Hasey, UC Farm Advisor, Sutter and Yuba Counties*

Emerging Walnut Issues in 2010 and Research Updates
Janine Hasey, UC Farm Advisor, Sutter/Yuba Counties

Research Efforts toward Replanting without Soil Fumigation and Movento for Nematode Control in Walnut
Mike McKenry, Extension Nematologist, UC Kearney Ag Center

Herbicide Resistant Weeds in Walnut Orchards – Issues and Management
Brad Hanson, Extension Weed Specialist, UC Davis

Break: ***Refreshments Courtesy of DuPont Crop Protection***

Laws and Regulation Update
Jan Kendel, Sutter County AG Department

Irrigation and Pruning Impacts on Canopy Management and Walnut Productivity
Bruce Lampinen, Pomology Specialist, UC Davis

The State of the Walnut Industry: Report from the California Walnut Board & Commission
Dennis Balint, CEO, California Walnut Board; Carl Eidsath, Technical Support Director; Michelle McNeil, Senior Marketing Director, International

Sponsored by: University of California Cooperative Extension, Sutter/Yuba and Colusa Counties

Co-Sponsored by: Sutter County Agricultural Department

2.0 hours PCA and 2.5 hours CCA Credit – Pending

To all tree and vine crop growers in the region!

Protecting Crops from Extreme Temperature Damage

Thursday, February 17, 2011
10:00 am – 12:00 pm

Sutter County AG Building
142A Garden Hwy, Yuba City

10:00	**Introductions** *Janine Hasey, UC Farm Advisor, Sutter/Yuba Co*
10:10	**Protecting Crops from Frost Damage** *Rick Snyder, UC Extension Specialist*
10:50	**How Hot is Too Hot at Prune Bloom?** *Franz Niederholzer, UC Farm Advisor, Sutter/Yuba Co.*
11:05	**Weather Forecasting Tools to Help Farmers** *Eric Kurth, Meteorologist, National Weather Service, Sacramento*
12:00	**Adjourn**

Sponsored by University of California Cooperative Extension, Sutter/Yuba Counties

Topics covered will include 1) active and passive frost protection practices, 2) weather tools for farmers from the National Weather Service and 3) critical bloom prune temperatures. Special guest speakers will be Rick Snyder, University of California Cooperative Extension Specialist in crop weather (micrometeorology) and Eric Kurth, Meteorologist, National Weather Service, Sacramento.

Walnut Pruning Field Meeting

Thursday, March 10, 2011

1:30 pm – 3:30 pm

Nickels Soil Lab, Arbuckle
(map on back page)

Demonstration of pruning 3 year old hedgerows and conventional planted walnut orchards with a look at two pruning trials for hedgerow Chandler and Howards

The workshop will be conducted by UC Farm Advisors & Walnut Specialist:

Janine Hasey, Sutter & Yuba Counties;
Carolyn DeBuse, Yolo & Solano Counties;
Bruce Lampinen, Pomology Specialist, UC Davis;
John Edstrom, Colusa County

IN THE EVENT OF RAIN, MEETING WILL BE HELD ON: **FRIDAY, MARCH 11, 1:30-3:30 PM**

Questions: Sutter/Yuba UCCE Office at 530-822–7515
or look at our website for updated Information at http://cesutter.ucdavis.edu/

Conservation Assistance Available for Organic Producers

California agricultural producers who are certified organic or transitioning to organic production may qualify for technical and financial assistance through a National Organic Initiative administered by USDA's Natural Resources Conservation Service (NRCS). Organic producers can receive up to $20,000 per year or $80,000 over six years through the special organic EQIP funding. The assistance targets over two dozen core conservation practices, including conservation crop rotation, cover crop, nutrient management, and pest management grazing.

Producers must submit applications by March 4, 2011
for funding consideration during fiscal year 2011.

Interested producers are encouraged to contact their local NRCS Service Center. Contact information is available at http://offices.sc.egov.usda.gov/locator/app?state=CA

The Latest on Powdery Mildew of Peach in California

J. E. Adaskaveg, UC Riverside Plant Pathologist

Powdery mildew of peach occurs worldwide, but is most damaging in semi-arid growing areas. This means that in some years in California the disease can be severe. The disease can be caused by several different species of powdery mildew fungi that commonly occur on Rosaceous plants. Historically, three species have been reported on peach with *Podosphaera pannosa (*formerly *Sphaerotheca pannosa*) being the most important one. *Podosphaera leucotricha* is less common and *P. clandestina* has been reported on peach seedlings in the eastern United States. More recently a fourth species we have identified a fourth species *P. tridactyla* in the central valley. Fruit infections can be caused by *P. pannosa*, *P. leucotricha* and *P. tridactyla* resulting in the most economic damage. Stem and leaf infections are important sources of overwintering and secondary inoculum, respectively.

The susceptibility of peach and other stone fruit crops varies greatly among cultivars. The eglandular (without glands at the leaf base) peach cultivars are more susceptible than the glandular ones. Furthermore, in some cultivars, tissues also vary in their susceptibility with fruit being more or less susceptible than leaves, depending on the mildew species involved and maturity of host tissue. Leaves, buds, green shoots, and fruit are commonly attacked by most powdery mildew fungi, but flower infections are rare. Symptoms include circular, white, web-like colonies that become powdery once masses of asexual conidia are produced in chains on all tissues. Leaves may then curl or become stunted. Severe infections commonly cause leaf chlorosis, necrosis, and leaf drop.

For mildew caused by *P. pannosa*, fruit are susceptible from the early stages of development until pit-hardening on peach. For *P. tridactyla*, fruit may be susceptible for extended periods but this is not completely studied. White circular spots may enlarge, coalesce, and cover large areas of the fruit. Based on indirect evidence, *P. leucotricha* (mainly an apple pathogen) presumably is involved in causing another powdery mildew symptom on peach fruit known as "rusty spot". With this disease, small, circular, orange-rusty lesions develop on the fruit that enlarge and may cover the entire fruit. No symptoms occur on leaves and stems. Lesion development has been related to rapid fruit growth. Infections for all powdery mildew species usually result in some deformation of the fruit surface with depressed or slightly raised areas. Secondary infections caused by other fruit decay fungi may also occur in necrotic mildew lesions.

Disease cycle. In the spring, newly developing leaves become diseased as they emerge from infected buds. When overwintering spore cases (chasmothecia) are present, ascospores are released that serve as primary inoculum. Because roses are an important host for the *P. pannosa* pathogen where the disease is not always managed, diseased roses can be major contributors to the development of epidemics of peach powdery mildew. Secondary infections by the wind-disseminated, asexual conidia occur throughout the growing season. Conidia germinate between 2 and 37°C, with an optimum of 21°C. Conidia can germinate in free water and at relative humidities of 43 to 100%. Excessive durations of wetness will kill conidia of powdery mildew fungi. During periods with warm, humid conditions the disease can quickly develop into an epidemic.

Management of powdery mildew. Selection of less susceptible cultivars, cultural practices, and the use of protective fungicide treatments are the most important practices for managing the disease. Less susceptible cultivars should be planted in areas that commonly have a high incidence of disease. To reduce the relative humidity in the orchard, the frequency of irrigation periods should be minimized and low-angle sprinklers should be used to keep foliage dry. Fungicide applications are done from full bloom until the pit hardening stage of fruit development for peach. Adequate management of rusty spot was achieved with three to four fungicide applications including the full bloom treatment in the most favorable conditions for disease.

Table 1. Treatment timing of fungicides for spring and summer diseases of peach and nectarine.*

Disease	Dormant	Bloom		3-6 weeks	Preharvest[1]	
		20-40%	80-100%	postbloom	3 weeks	1 week
Brown rot	----	++**	+++	+	++	+++
Powdery mildew	----/ND	++	+++	+++[2]	----	----
Scab	----	+	++	+++	----	----
Rust	+[3]	----	----	+++	++	----

* - Visit the UCIPM program at www.ucipm.ucdavis.edu.
** Rating: +++ = most effective, ++ = moderately effective, + = least effective, ---- = ineffective, and ND = no data but needs to be evaluated. Note: Not all indicated timings may be necessary for disease control if environmental conditions are not favorable or the pathogen is not present.
[1] Timing not exact; weather conditions determine need for treatment.
[2] Apply until pit hardening.
[3] Fall application before winter rains begin is the most important; additional spring sprays are seldom required but may be needed to protect the fruit if heavy persistent spring rains occur.

Several products are available for managing powdery mildew. Wettable sulfur has been known to be effective for many years but has the shortest residual residue. In orchards where mildew has been a problem, a pre-bloom treatment with wettable sulfur can be used to reduce the chasmothecia and subsequently the primary inoculum.

For bloom sprays the SBI fungicides (propiconazole/Tilt, Bumper, fenbuconazole/Indar, metconazole/Quash, myclobutanil/Rally, tebuconazole/Elite, Tebuzol, Orius in EC or WP formulations; the QoI fungicides (such as azoxystrobin/Abound) or trifloxystrobin/Gem; and wettable sulfur are effective materials. Other materials include premixtures such as pyraclostrobin & boscalid/Pristine and the newly registered propiconazole & azoxystrobin/Quilt Xcel. Several new premixtures will be registered this coming year and include azoxystrobin&difenoconazole/Quadris Top, trifloxystrobin & fluopyram/Luna Sensation and pyraclostrobin & fluxapyroxad/BAS703. In our testing this year we found that the new SDHI products, fluopyram and fluxapyroxad, are also highly effective against powdery mildew but will only be sold as premixtures. Thus the premixtures offer high activity, very consistent performance, and built-in resistance management with two different modes of action for powdery mildew management.

Lastly for petal fall (to pit hardening) treatments, the products mentioned above can be used, as well as two new materials that only have activity against powdery mildew. Quinoxyfen/Quintec, which was registered in 2010, has a unique mode of action and can be used to break-up overuse of SBI and QoI fungicides. Another material with a different mode of action that is only active against powdery mildew is metrafenone. This material is not registered on tree crops but it is going through the specialty crop registration process. The outlook is very positive for new modes of action that are highly effective against powdery mildew. Just as using single-site mode of action fungicides, when using pre-mixtures or tank mixtures rotate between the FRAC Groups, never apply more than two consecutive applications of the same FRAC Group number, and, ideally, rotate between the FRAC Groups with every application.

Table 2. Fungicides registered or planned for registration for managing selected diseases of peach*.

New Products	Fungicide[1,3]	Resistance Risk (FRAC#)[1]	Brown rot[2]		Powdery mildew[2]	Scab	Rust
			Blossom	Fruit			
	Elite/Orius/Tebuzol	high (3)	++++	++++	+++	++	+++
	Indar/Enable[4]	high (3)	++++	++++	+++	++	ND
	Orbit/Tilt/Bumper	high (3)	++++	++++	+++	++	+++
2010	Quash	high (3)	++++	++++	+++	ND	+++
	Rally	high (3)	+++	+++	++++	ND	ND
	Pristine	medium (7/11)[5]	++++	++++	+++	+++	+++
Late 2011	Luna Sensation	medium (7/11)[5]	++++	++++	+++	+++	+++
	Inspire Super	medium (3/9)	++++	++++	+++	++	+++
2009	Adament	medium (3/11)	++++	+++	+++	ND	+++
2011	Quadris Top*	medium (3/11)	++++	+++	+++	ND	+++
2010	Quilt Xcel*	medium (3/11)	++++	++++	+++	ND	+++
	Topsin-M /T-Methyl /Thiophanate-Methyl[3]	high (1)[5]	++++	++++	+++	+++	+
	Elevate	high (17)[5]	+++	+++	+	ND	ND
	Abound	high (11)[5]	++	+	++	++++	+++
	Gem	high (11)[5]	++	+	++	++++	+++
2010	Quintec	high (13)	----	----	++++	----	----
	Sulfur[10]	low (M2)	+/-	+/-	+++	+++	+++

* - Visit the UCIPM program at www.ucipm.ucdavis.edu.

** - **Rating:** ++++ = excellent and consistent, +++ = good and reliable, ++ = moderate and variable, + = limited and/or erratic, +/- = minimal and often ineffective, ---- = ineffective, ND = no data, and NR = not registered.

[1] Do not use fungicides with the same FRAC number and high resistance risk more than twice in one year.

[2] Strains of *Monilinia fructicola* resistant to Benlate (label withdrawn), Topsin-M, and T-Methyl are present in some peach and nectarine orchards. Resistant strains of the jacket rot fungus, *Botrytis cinerea*, and powdery mildew fungi have been reported in California on crops other than almond and stone fruits and may have the potential to develop in peach and nectarine with overuse of fungicides with similar chemistry. Sub-populations of both *Monilinia* spp. have been shown to be resistant to AP (FRAC 9) fungicides in a few prune orchards in northern CA.

[3] To reduce the risk of resistance development start treatments with a fungicide with a multi-site mode of action; rotate or mix fungicides with different mode of action FRAC numbers for subsequent applications, use labeled rates (preferably the upper range), and limit the total number of applications/season.