San Joaquin
Pomologist

po• mo•lo•gy\ po˙mäleji\ n [tr. L *pomum* fruit + *logia* - logy study] 1: the science of the cultivation of fruits 2: the science or practice of growing, storing, processing and marketing fruits

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SILVER BULLET FOR SERR DROP?

Some of you have asked me about reports circulating that a new product is available for reducing flower drop in Serr walnuts. Here are the facts.

Pistillate flower abortion (PFA) is caused by over-pollination. When Serr flowers get too many pollen grains on the sticky surface of the pistil - from Serr or pollenizer variety catkins releasing pollen at the time Serr flowers are open – the flower aborts and falls from the tree. This drop is different from non-pollination drop, which occurs a few weeks later when nutlets are around ¼-inch in diameter. Chandler and other varieties are also susceptible to PFA, but not nearly so dramatically as Serr.

It has been known for some time that walnut flowers produce ethylene, a gas produced naturally by many plants when they are about to abort. ReTain®, a plant growth regulator marketed by Valent BioSciences Corporation, inhibits natural ethylene production. It is registered and used on apples and pears to improve post-harvest storage of those crops.

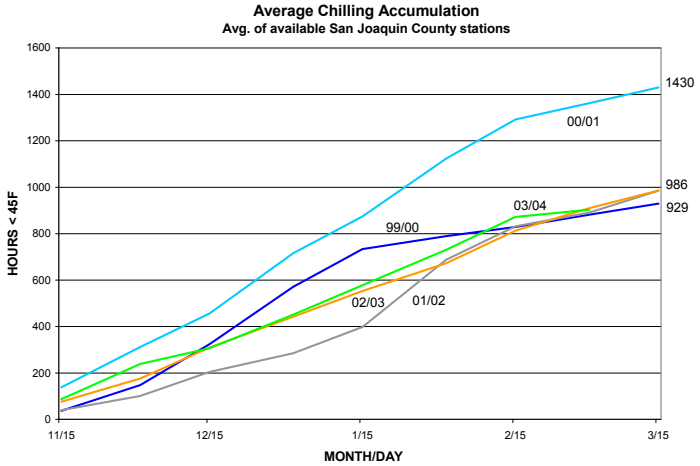
Kings County UC Farm Advisor Bob Beede, speculated that ReTain® might reduce PFA if sprayed on walnuts. Last year, Bob conducted a small-scale experiment to test this idea. He sprayed a ReTain® solution on individual Serr flowers during bloom and observed that PFA was markedly reduced compared to untreated flowers on the same trees.

ReTain® is not registered for use on walnuts in California. Bob, I, and other farm advisors will be collaborating with Valent BioSciences this year to see if we can duplicate Bob's results and identify optimal rates and timings for ReTain® on Serr. If these trials are successful, and Valent BioSciences pursues registration of ReTain® on walnuts, we may soon have a treatment that helps reduce PFA and boost Serr yields.

WINTER CHILLING RECAP

San Joaquin County orchards have been exposed to only moderate chilling this winter. We conventionally measure chilling accumulation as the total number of hours with temperatures below 45°F, between November 1 and March 15. As seen in the chart of accumulated chilling for recent years, the pattern of average chilling accumulation this winter has been very similar to last year, except for slightly better chilling in late November and late January/early February this winter. It appears we will end up with a seasonal total around 900 hours for 2003/2004 in most county locations, with the exception of the Tracy area, which has been running around 150 hours less than east county sites.

As was the case last year, expect to see signs of less-than-optimal chilling in high chill requiring crops like apples and cherries. Peaches and apricots may also be affected, depending on the chilling requirement of particular varieties. Leaf-out and bloom will likely be delayed and/or prolonged, making it difficult to properly time bloom and post-bloom spray applications. These impacts on bloom may also carry through to harvest - especially for short season crops like cherries, apricots, and early peaches – and lead to uneven fruit growth and ripening and a need for multiple picks to achieve uniform fruit size and maturity.



WHAT'S THIS DISCHARGE WAIVER THING, ANYWAY?

If you haven't heard by now about new regulations governing off-site flow of storm and irrigation water run-off from orchards and other irrigated farming operations, you will soon. The following is a brief history and description of the situation.

The California Water Code is the body of laws governing water use and quality in California. (Many aspects of water use and quality are also governed by federal law.) The State Water Quality Control Board, through its nine regional boards (RWQCBs) is charged with regulating waste discharges that may affect surface and ground water quality, including discharges of irrigation return flows and storm water run-off from agricultural lands.

Since 1982, the Central Valley RWQCB has allowed irrigated agricultural operations a waiver from the waste discharger reporting requirements imposed on other types "point-source" discharges such as cities and factories. This began changing in 1999 with the passage of Senate Bill 390, which stipulated that agricultural waivers should be sunsetted by January 2003. In November 2000, a consortium of environmental groups petitioned the Central Valley RWQCB to rescind these waivers and regulate agricultural discharges the same way it does these other discharges.

After much discussion, consultation, and soliciting of input by the Central Valley RWQCB, they adopted in July 2003 a resolution that establishes a "conditional waiver" system for irrigated agricultural lands. Under this system, owners of irrigated agricultural lands producing actual or potential run-off of storm or irrigation water to natural or man-made surface water bodies must obtain a waiver from the waste discharge regulations. The conditional waivers have reporting and monitoring requirements, which are still being hammered out.

There are three ways growers can comply with the new regulations. The first is to submit an application, called a Report of Waste Discharge, to the RWQCB. The fees and documentation associated with this option make it unlikely that growers will choose it, but it is available. The second option is to submit a Notice of Intent with the RWQCB to register as an *individual* discharger covered under the conditional waiver. The third is to join a *coalition* group approved by RWQCB to work cooperatively toward meeting the conditional waiver requirements. Like the first option, there are reporting and monitoring responsibilities for the individual and coalition conditional waiver options.

The details of this program are still being worked out. What San Joaquin County growers need to know is that, if your property falls within the scope of the definition given above, you must comply with the conditional waiver requirements by electing one of the three options. Most growers are aligning with coalition groups in order to ease the cost and burden of compliance. To date, the RWQCB has approved several coalition groups to enroll growers. One of the groups available to growers in San Joaquin is the San Joaquin County & Delta Water Quality Coalition, coordinated by the San Joaquin County Regional Conservation District. Other coalition groups may be organized as the regulatory picture becomes clearer.

For more information on the conditional waivers program, contact the Central Valley RWQCB at (916) 464-3291 or visit their web site: www.swrcb.ca.gov/rwqcb5/programs/irrigated_lands/.

FUNGICIDE EFFICACY CHARTS

I have included with this newsletter new fungicide efficacy and spray timing charts put together by UC plant pathologists for apples and pears, peaches and nectarines, and cherries. These charts were compiled by Jim Adaskaveg, Brent Holtz, Themis Michailides, and Doug Gubler. Similar charts for other fruit and nut crops are available on the web at www.uckac.edu/plantpath/2004EFFICACY-TIMING.pdf.

APPLE AND PEAR—FUNGICIDE EFFICACY

Fungicide	Resistance risk [1]	Scab		Powdery mildew (apple only)
		Protectant	Eradicant	
Bayleton	high	----	----	+++
Benlate [2]	high	+++	+++	+++
Flint	high	++++	++++	++++
Procure [3]	high	++++	++++	++++
Rally [4]	high	++++	++++	++++
Rubigan [3]	high	++++	++++	++++
Topsin M	high	+++	+++	+++
Vangard	high	+++	+++	+++
Captan [5]	low	++	----	----
Maneb [5]	low	++	----	----
Thiram [4]	low	++	----	----
Ziram [5]	low	++	----	----
Copper	low	++ [6]	----	----
Lime sulfur [7]	low	----	++++ [7]	+++ [8]
Sulfur	low	++	----	++++

Rating: ++++ = excellent and consistent, +++ = good and reliable, ++ = moderate and variable, + = limited and/or erratic, +/- = minimal and often ineffective, ---- = ineffective.

1. Do not use the same fungicide or fungicides with similar chemistry and high resistance risk more than twice during a season.

2. Label withdrawn.

3. On pear, use only **before** white bud and **after** full bloom.

4. Labeled on apple but not on pear.

5. These are important components of resistance management programs.

6. Copper, though effective for scab control, causes fruit scarring.

7. "Burns out" scab twig lesions when applied at delayed dormant and disrupts pseudothecial development when applied to leaves in fall. CAUTION: LIME SULFUR IS INCOMPATIBLE WITH MOST OTHER PESTICIDES. CHECK BEFORE USE.

8. In-season application eradicates powdery mildew.

APPLE AND PEAR—TREATMENT TIMING

Note: not all indicated timings may be necessary for disease control.

Disease	Fall	Delayed dormant	Green tip	Pink bud	Spring
Scab [a]	++ [b]	++ [b]	+++	+++	+++
Powdery mildew [c]	----	----	----	++++	+++

Rating: +++ = most effective, ++ = moderately effective, + = least effective, and ---- = ineffective

a. Protection of early tissue is important. Additional applications should be made according to infection periods as determined by the Mills table.

b. Disruption of pseudothecial development (fall) and inactivation of overwintering twig lesions (delayed dormant) occurs; effects of these treatments on disease control uncertain.

c. Early application is most effective; added treatments are made if mildew continues.

CHERRY--FUNGICIDE EFFICACY

Fungicide	Resistance risk	Brown rot [1]		Botrytis	Powdery mildew [1]	Shot hole Leaf spot [2]
		Blossom	Fruit			
Benlate [3]	high	++++	++++	++++	+++	
Elite	high	++++	++++	++	++	
Indar	high	++++	+++	----	+++	
Orbit (Break)	high	++++	++++	----	+++	
Pristine	medium	++++	++++	+++	+++	
Rovral [4] + oil [5]	low	++++	++++	++++	++	
Topsin M [3]	high	++++	NR	++++	+++	
Abound	high	+++	+	----	++	
Cabrio	high	+++	++	----	++	
Elevate	high	+++	++++	++++	+	
Rally [6]	high	+++	+++	----	++++	
Rovral [4]	low	+++	NR	+++	----	
Rubigan	high	+++ [9]	+++ [9]	----	++++	
Botran	high	++	++	+++	?	
Bravo /Echo [7,8]	low	++	?	++	----	
Captan [8]	low	++	++	++	----	
Copper	low	+/-	----	----	----	
Sulfur	low	+/-	----	----	+++	
Ziram	low	+/-	?	----	----	

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

1. Do not use the same fungicide or fungicides with similar chemistry more than twice in one year.
2. Shot hole and leaf spot occur infrequently on cherry in California; control usually is not necessary.
3. Benlate label withdrawn. Strains of *Monilinia fructicola* resistant to Benlate and Topsin are present in some California cherry orchards.
4. Blossom blight only; not registered for preharvest use.
5. Oil is a "light" summer oil, 1-2% volume/volume.
6. More effective when applied as a concentrate (80-100 gal/acre) than as a dilute spray.
7. Do not use after shuck split.
8. Do not use in combination with or shortly before or after oil treatment.
9. Not registered for brown rot.

CHERRY—TREATMENT TIMING

Note: not all indicated timings may be necessary for disease control.

Disease	Late budbreak	Popcorn	Full bloom	Petal fall	2-3 weeks later	Preharvest 1-10 days [a]
Botrytis	----	+++	+++	++	----	+++
Brown rot [b]	----	+++	+++	++	----	+++
Powdery mildew [c]	++	++	++	+++	+++	----

Rating: +++ = most effective, ++ = moderately effective, + = least effective, and ---- = ineffective

a. Select broad spectrum fungicides (or combinations) that have activity against both brown rot and Botrytis fruit rots.

b. Begin at popcorn and repeat every 10 to 14 days through bloom if rains continue.

c. Use sulfur at late bud break, other fungicides for later treatment. Treat immediately if mildew is found on shoots or leaves on inner scaffolds.

PEACH AND NECTARINE—FUNGICIDE EFFICACY

Fungicide	Resistance risk [1]	Brown rot [1]		Powdery mildew [1]	Scab	Rust	Leaf curl	Shot hole
		Blossom	Fruit					
Benlate [2]	high	++++	++++	+++	+++	+	----	----
Elite	high	++++	++++	+++	++	+++	----	+/-
Indar	high	++++	++++	+++	+++	?	----	+/-
Orbit (Break)	high	++++	++++	+++	----	+++	----	+/-
Pristine	medium	++++	++++	+++	+++	ND	ND	++++
Rovral [3]+ oil [4]	low	++++	++++	+	+	++	----	++
Topsin [2]	high	++++	++++	+++	+++	+	----	----
Vangard	high	++++	+++ [7]	ND	?	?	----	+
Elevate	high	+++	+++	?	?	?	?	?
Rally	high	+++	+++	++++	----	----	----	----
Rovral [3]	low	+++	+++	----	----	----	----	----
Abound	high	++	+	++	++++	+++	----	++
Botran	high	++	+	?	?	?	?	?
Bravo/Echo [5,6]	low	++	----	----	+++	+	+++	+++
Captan [6]	low	++	++	----	+++	----	----	+++ [8]
Copper	low	+/-	----	----	----	----	+++	+++
Sulfur	low	+/-	+/-	+++	+++	+++	----	----
Ziram	low	+/-	----	----	+++	----	++++	+++

Rating: ++++ = excellent and consistent, +++ = good and reliable, ++ = moderate and variable, + = limited and/or erratic, +/- = minimal and often ineffective, ---- = ineffective, and ? = insufficient data or unknown; ND= labeled, no data.

1. Do not use the same fungicide or fungicides with similar chemistry and high resistance risk more than twice in one year.
2. Benlate label withdrawn. Strains of *Monilinia fructicola* resistant to Benlate and Topsin are present in some peach and nectarine orchards.
3. Blossom blight only; not registered for preharvest use.
4. Oil is a "light' summer oil, 1-2% volume/volume.
5. Do not use after shuck split.
6. Do not use in combination with or shortly before or after oil treatment.
7. High summer temperatures and relative humidity reduce efficacy.
8. Not effective if used as a dormant treatment.

PEACH AND NECTARINE—TREATMENT TIMING

Note: not all indicated timings may be necessary for disease control.

Disease	Dormant	Bloom		3-6 weeks post bloom	Preharvest [a]	
		20-40%	80-100%		3 weeks	1 week
Brown rot	----	++	+++	+	++	+++
Powdery mildew	----/?	++	+++	+++	----	----
Leaf curl [b]	+++	+	----	----	----	----
Rust	+ [c]	----	----	+++	++	----
Scab	----		++	+++	----	----
Shot hole [d]	+++	+	+	++	----	----

Rating: +++ = most effective, ++ = moderately effective, + = least effective, ---- = ineffective, and ? = no data but needs to be evaluated.

a. Timing not exact; weather conditions determine need for treatment.

b. Treatment should be made before bud break and preferably before bud swell.

c. Dormant treatment with liquid lime sulfur.

d. 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.

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Joe Grant
Fruit & Nut Crops Advisor

MARK YOUR CALENDARS

The annual **Central California Apple Symposium** is scheduled for the April 13, 2004. Program details will be mailed in the coming weeks. Please mark your calendars and plan to attend.

Cherry Day 2004, sponsored by the California Cherry Advisory Board, will be held March 17 at the Waterloo Gun & Bocci Club in Stockton. For information, contact the CCAB at (209) 368-0685.