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

University of California
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*Making a Difference for California*
Cooperative Extension Sutter-Yuba Counties

# Pomology Notes

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IN THIS ISSUE



Submitted by:

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## Prune Orchard Activities To Consider In March:

- Bee activity in a prune orchard is necessary to set a crop. Decide if you want to put out bees in your orchard this year and order hives. The general rule is one hive/acre. An experienced grower I know uses less bees when the bloom weather is cool and more bees when hot, dry weather is predicted for bloom.
- Get orchard ready for bloom -- a plowed or mowed orchard is warmer than an orchard with tall weeds/cover crop.
- Make plans to protect flowers from brown rot -- if bloom time weather is wet. Prune flowers are susceptible to brown rot beginning at green bud. Alternate between different fungicide chemistry classes when planning a two-spray program. Check the FRAC numbers on the label to make sure you are making a chemistry change. For example, Vangard (FRAC 9) at green bud and Tilt/Bumper (FRAC 3) at full bloom, is a solid rotation.
- Consider spraying captan or chlorothanil (Bravo/Echo) at full bloom to reduce russet scab on fruit at harvest.
- Get air-blast sprayer ready to apply bloom fungicides. Check calibration and do general maintenance (check sprayer filters, replace nozzles as needed, etc.)
- If you have sprinkler (impact or micro-jet) irrigation, check out/maintain irrigation system used for frost control/orchard cooling.
- Evaluate cropload (mid-April) **before** applying nitrogen or potassium fertilizer. Cropload is THE major factor deciding nutrient needs in a mature orchard. The more fruit, the more nutrients required.
- Place order for peach twig borer traps. Traps should be up by April 1, and UC recommends 2 traps per block. Post San Jose scale pheromone traps in the orchard by the end of this month.
- Make sure newly planted trees (replants and new orchards) are protected from sunburn and herbicides by paint + "nursery boxes". If nursery boxes are used without painting trees, the boxes should be flattened (look like ◊ this from the top, not this □) to avoid "box burn".

# Heat at bloom update

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Excessive heat – sustained temperatures above 80°F -- at bloom can cause virtual crop failure in prunes. How bad can it be? In Sutter County, average prune yield per acre is in the range of 2.5 dry tons per acre over the last decade – in good crop years. In 2004, 2005, and 2007, when temperatures reached above 80°F at bloom, the Sutter County crop was 0.5, 0.7, and 0.6 dry ton per acre, respectively. Losses like this cost growers dearly in several ways. First, there is the obvious loss of income in those years. Second and longer lasting, catastrophic losses force local and international packers to find other sources of prunes, fruit not grown in California, to fill their orders. Recovering that market share can be difficult, even with a high quality product such as California prunes.

**What hot temperatures and weather patterns are most damaging to prune fruit set?** In the three years of crop disasters in Sutter County, the bloom weather has been similar:

- Early to normal bloom timing (March 10-15) with no rain from first flower to full bloom.
- Warm temperatures (70+°F daily maximum) begin early, even before any flowers open, and continue as bloom begins. These conditions help make a short, compact bloom period that can be more vulnerable to a spike in temperatures at the wrong time.
- Extreme heat (83+°F) occurs around full bloom and is sustained for at least two days. Extreme heat (85-87°F max) right around full bloom seems to have a big role in damaging the crop set. Appearance of extreme heat early in bloom followed by cooler temperatures doesn't appear to harm the crop as much as heat at full bloom or closely after.

**What can growers do if these conditions appear as bloom approaches?** Run water. Even though running water has not dropped orchard temperatures dramatically in recent research, it does provide some small relief, and may have some benefits we have not been able to measure in our recent work. Just the orchard surface foot of soil needs to be wet, so deep watering is not necessary. Anything else? Not that research has shown to date. We will continue to look at possible spray options at bloom.

# It's Your Money

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## NEW PRODUCTS

Some Good, Some Questionable

Do you have money to waste? There are many easy ways to spend it. New products for agricultural use appear on the market in a steady stream. Some of these products have real merit – they do a job for you and help you make a profit. A few have contributed to important advances in agriculture.

Other products may be of questionable value. They may be grossly overpriced – or of little use – or both. Such items waste your money. Often these products are sold by enthusiastic persons who use scientific-sounding sales talks, promising great benefits heretofore not available. These salesmen promise benefits based on "knowledge," which is usually pure fancy.

Hopes: Almost everyone would like to get something for little or nothing, and it is human to hope that science will provide an easier and/or cheaper way of solving today's farming problems. Promoters capitalize on these hopes. They want you to think that some new "truth" – not yet fully appreciated – is just being made use of, and maybe you can "get in on the ground floor."

Cost: Products of doubtful value are seldom entirely worthless, but they are often worth very little in relation to their cost. Questionable products usually carry an enormous markup on their price to pay for the extensive sales campaign. Rarely do these commodities prove to be a profitable investment and, occasionally, they produce detrimental effects.

## IDENTIFICATION

How do you determine which products you should be wary of buying? What clues should you look for?

The promotional patterns for products of questionable value have common, identifiable characteristics. Such sales campaigns may include one or several of the following statements or claims.

- The product contains a secret or unknown ingredient that is very potent – almost magical in its benefits.
- The commodity produces such remarkable results because it operates on a "newly discovered, secret principle." Or it involves an entirely "new approach" to soil chemistry, the physical condition of the soil, or soil fertility. Or it operates by action of mysterious forces, such as magnetism, catalytic action, nutrient release, micro-organism or enzyme activation, etc.

  This is all described in "scientific" language that is persuasive, perhaps, to potential buyers, but is meaningless to reputable scientists.
- The discovery is so new that most scientists haven't heard about it yet. Or it is clamed that scientists with universities and the United States Department of Agriculture are backward and refuse to conduct research on the product.
- Tests under controlled conditions in the laboratory or field are usually played down, stating that they don't show the benefits obtained in "practical" agriculture.
- Using the product gives numerous, beneficial side effects – extra dividends. These are all highly desirable, but are not easily identified or measured.
- The benefits claimed are supported by large numbers of testimonials – "unsolicited," of course.

  Such claims are mostly personal opinions. Data from properly conducted trials or research are seldom shown.
- Instructions accompanying the product often recommend using it in combination with good management practices which, by themselves, may produce all the benefits that can be seen or measured.

  In other words, the advice you get on the label may be worth more than the contents of the package!
- The active ingredient may be the same as that in a well-known, reputable product, but the recommended quantity is less because of its "new formulation" or "magical properties."

  In such cases, the price per unit of active ingredient is much higher than for the well-known product.

IT'S YOUR DECISION

You may be tempted to buy or use a product having some of the promotional features listed. However, you can save yourself time, money, and disappointment if you first do the following.

- Don't decide in a hurry. Consult a responsible, experienced person before you commit your dollars.
- If you decide to try the product, buy just enough to treat a small portion of your land (1 acre or less). Compare the results with an adjacent plot of equal size on which you did not use the product, but where all other operations and conditions were identical. Then compare yield records or other measurable results.
- Carefully evaluate all new products. Demand adequate proof of their value for your soil conditions and management practices.

Investigate before you invest!

AFTER ALL….IT'S YOUR MONEY.

## Saving Glyphosate

*Franz Niederholzer, UC Farm Advisor & John Roncoroni, UC Farm Advisor*

Glyphosate, the active ingredient in Roundup, is the most commonly used herbicide in California. Highly effective, safe for the user and the environment, and now inexpensive, glyphosate is a valuable weed management tool. How valuable? Imagine the cost of weed control if you couldn't count on glyphosate.

Resistance – the inherited ability of a plant to survive and produce healthy seed after being sprayed with enough material to kill non-resistant plants of the same species – has developed to glyphosate in several weeds in California. These include rigid ryegrass, annual ryegrass, marestail (Horseweed), Hairy fleabane, and junglerice. Glyphosate resistance is a gradual process -- a sort of "resistance creep" -- compared to the sudden resistance that can appear in certain crop/herbicide situations (think Londax® in rice production). Reducing the chance of glyphosate resistance developing in other weed species is the topic of this article. The following are key points to effective glyphosate use in non-cultivated orchards.

**Get the best weed control possible when using glyphosate**. This means optimum spray solution pH, chemistry and glyphosate concentration. Here's what you want in the tank:

- Spray solution pH = 4-6. If spray water is pH≥7, add acidify/buffer first.
- Spray solution hardness <150 ppm calcium or < 300 ppm sodium. Hard water reduces the efficacy of glyphosate. To counter this, add ammonium sulfate (17 lbs/100 gallons of water) or other water treatment before adding gyphosate to the tank. Ammonium ion improves glyphosate performance regardless of water hardness due to improved leaf penetration.
- A solid rate of non-ionic surfactant adjuvant to improve leaf penetration if not included in glyphosate product formulation. Check the label to see what adjuvants can be added to the tank.
- High label rate of glyphosate to kill weeds that are slipping towards resistance. Skimping on glyphosate rate, even if it looks like it works, invites resistance creep. With the low price of glyphosate, don't risk resistance, use a full rate.

- Tank mix glyphosate with postemergent herbicides that can control glyphosate resistant weeds. Possible options – depending labeling for the specific tree/vine crop -- include Treevix™, Rely 280®, Gramoxone®, Shark® and Venue®. Consult with your PCA for registration status, materials, and rates.
- Careful! Keep glyphosate sprays away from your crop. Avoid drifting glyphosate onto crop leaves or spraying sensitive bark of young trees. Lower spray pressure and boxed/painted young trees are keys to crop-safe glyphosate use.

**Spray glyphosate at the right time**. Spray weeds early and when they are not stressed. Don't let weeds go to seed, or even form flowers/release pollen. Smaller weeds are easier to kill than more mature plants of the same species. Dry and dusty weeds are less sensitive to glyphosate than unstressed weeds.

**Consider using preemergent herbicides** to control a broad spectrum of weeds, including those with or creeping towards glyphosate resistance. Effective new products -- Alion, Pindar GT, Matrix, Chateau and others -- give growers and PCAs many tools for preemergent weed control. For best results, these materials generally require rain or irrigation water to move them into the soil and a clean soil surface when applied. If the pre-emergent herbicide you are using has no post emergent activity and the glyphosate resistant weed that you are trying to control has already germinated, combining the pre-emergent with glyphosate will most likely not be effective– for example glyphosate plus surflan on 3 inch tall resistant ryegrass. In this case, include a herbicide in the tank that is effective on the glyphosate resistant weed in the field.

**Check then control, then check control**. Walk the field to see what weeds are present before spraying, match herbicide to the weeds present, and check control after spraying. How did you do? See any weeds "coming through" your glyphosate spray? If you do, work with your PCA to add products or practices to control those uncontrolled weeds. Hand weeding a few rogue weeds before they go to seed might save you a lot of trouble.

**Doesn't all this cost extra?** YES. Glyphosate resistance management costs extra, but it costs less than farming without effective glyphosate.

## PRUNE (DRIED PLUM): FUNGICIDE EFFICACY

| Fungicide | Resistance risk (FRAC#)[1] | Brown rot | | Russet scab | Rust |
|---|---|---|---|---|---|
| | | Blossom | Fruit[2] | | |
| Adament[2,7] | medium (3/11) | ++++ | ++++ | ---- | +++ |
| Bumper/Tilt[2] | high (3) | ++++ | ++++ | ---- | +++ |
| Distinguish** | medium (9/11) | ++++ | ++ | ---- | ++ |
| Elite/Tebuzol[2,7] | high (3) | ++++ | ++++ | ---- | +++ |
| Indar[2] | high (3) | ++++ | ++++ | ---- | +++ |
| Inspire*[2] | high (3) | ++++ | ++++ | ---- | +++ |
| Inspire Super* | high (3/9) | ++++ | ++++ | ---- | +++ |
| Luna Sensation*[2] | medium (7/11)[4] | ++++ | ++++ | ND | ND |
| Pristine[2] | medium (7/11)[4] | ++++ | ++++ | ND | ND |
| Quash* [2] | high (3) | ++++ | ++++ | ---- | +++ |
| Quadris Top*[2] | medium (3/11)[4] | ++++ | ++++ | ND | ++++ |
| Quilt Xcel*[2] | medium (3/11)[4] | ++++ | ++++ | ND | ++++ |
| Rovral + oil[2,5] | low (2) | ++++ | NR | ---- | NR |
| Scala[6] | high (9)[3,4] | ++++ | +++[6] | ---- | ND |
| Topsin-M /T-Methyl/Thiophanate-Methyl + oil[2,4] | high (1)[4] | ++++ | ++++ | ---- | ---- |
| Vangard[6] | high (9)[3,4] | ++++ | +++[6] | ---- | ND |
| Elevate[2,7] | high (17)[4] | +++ | +++ | ND | ---- |
| Rovral/Iprodione /Nevado[2] | low (2) | +++ | NR | ---- | NR |
| Topsin-M/T-Methyl/Thiophanate-Methyl [2,3] | high (1)[4] | +++ | +/- | ---- | ---- |
| Abound | high (11)[4] | ++ | + | ---- | +++ |
| Botran | medium (14) | ++ | ++ | ND | ND |
| Bravo/Chlorothalonil/Echo/Equus[8,9,10] | low (M5) | ++ | ++ | ++ | ----[9] |
| Captan[7,8,10] | low (M4) | ++ | ++ | +++ | ---- |
| Gem[7] | high (11)[4] | ++ | + | ---- | +++ |
| Rally[2] | high (3) | ++ | ++ | ---- | ---- |
| Sulfur[10] | low (M2) | +/--- | +/--- | ---- | ++ |

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

*** Registration pending in California.**

****Not registered, label withdrawn or inactive**

[1] Group numbers are assigned by the Fungicide Resistance Action Committee (FRAC) according to different modes of actions (for more information, see http://www.frac.info/). Fungicides with a different group number are suitable to alternate in a resistance management program. In California, make no more than one application of fungicides with mode of action Group numbers 1, 4, 9, 11, or 17 before rotating to a fungicide with a different mode of action Group number; for fungicides with other Group numbers, make no more than two consecutive applications before rotating to fungicide with a different mode of action Group number..

[2] Fruit brown rot treatments for fungicides in FRAC Groups 1,2, 3, 17, 7/11 are improved with the addition of 2% light summer oil. The oil is "light" summer oil (1-2% vol/vol). If applied in summer, fruit will loose their waxy bloom and look red. They will dry to normal color.

[3] Strains of *Monilinia fructicola* and *M. laxa* resistant to Topsin-M and T-Methyl have been reported in some California prune orchards. No more than two applications of Topsin-M or T-Methyl should be made each year. 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 prune with overuse of fungicides with similar chemistry. Subpopulations of both *Monilinia* spp. have been shown to be resistant to AP (FRAC 9) fungicides on prune in CA.

[4] 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.

[5] Blossom blight only; not registered for use after petal fall.

[6] High summer temperatures and relative humidity reduce efficacy.

[7] Registered for use on fresh prunes only.

[8] Do not use in combination with or shortly before or after oil treatment.

[9] Do not use after jacket (shuck) split.

[10] Do not use sulfur, captan, or chlorothalonil in combination with or shortly before or after oil treatment.

## PRUNE (DRIED PLUM): TREATMENT TIMING

**Note: Timings listed are effective but not all may be required for disease control. Timings used will depend upon orchard history of disease, length of bloom, and weather conditions each year.**

| Disease | Green bud | White bud | Full bloom | May | June | July |
|---|---|---|---|---|---|---|
| Brown rot[1] | +++ | +++ | +++ | ---- | + | ++ |
| Russet scab[2] | ---- | ---- | +++ | ---- | ---- | ---- |
| Rust[3] | ---- | ---- | ---- | + | ++ | +++ |

**Rating:** +++ = most effective; ++ = moderately effective; + = least effective; ---- = ineffective

[1] Flowers are susceptible beginning with the emergence of the sepals (green bud) until the petals fall but are most susceptible when open.
[2] A physiological disorder; no pathogens involved.
[3] More severe when late spring rains occur.