

University of California
Agriculture and Natural Resources
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From the Shell

March, 2015

Produced by:



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Farm Advisor
Fresno & Madera
Counties

Save the date!

Thursday, May 28, 2015

Almond Symposium- 2015

Contents

- Almond Symposium Announcement
- Orchard Operations for March
- Use of phosphite-containing products in 2015—A memo
- ‘Advances in Walnut Production’ Short Course
- Weekly Evapotranspiration forecast

When?

Thursday, May 28, 2015
8:00 am to 12:00 pm

Where?

Kerman Community Center
15101 W. Kearney Blvd.,
Kerman, CA

Key Topics:

Drought management
Canker Diseases
Laws and Regulations
Navel Orangeworm Update
And more!

Detailed agenda will be out in next few weeks!

PCA/ CCA continuing education Credits

Registration—\$10 only
(Lunch included)

Questions or comments? Contact:

Gurreet Brar, (559) 241-7515
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Our programs are open to all potential participants. Please contact the Fresno County UCCE office (two weeks prior to the scheduled activity) at 559-241-7515 if you have any barriers to participation requiring accommodation.

Orchard Operations for March

Gurreet Brar, UCCE Farm Advisor, Fresno & Madera Counties

Almonds:

The common foliar diseases that could affect almond during post-bloom period are: jacket rot, shot hole, anthracnose and rust. If the orchard has a history of rust disease, we should consider spray applications after petal fall. I am providing an overview here in terms of symptoms and management, so that they can be monitored and managed in a timely manner, starting with brown rot blossom blight, a disease that infects flowers from pink bud stage through full bloom. These diseases can be effectively managed with well-timed management strategies. One of the most important things to keep in mind is that fungicides should be sprayed in rotation, according to their FRAC group number for fungicide resistance management. To learn more about FRAC numbers and fungicide efficacy and timings go to the UCIPM webpage here:

<http://www.ipm.ucdavis.edu/PMG/r3902111.html>

Brown rot blossom blight:

Causal organism: *Monilinia laxa*, *Monilinia fructicola*

Infects: petals, pistils and stamens of almond flower. After infection, the fungus moves into woody tissue and kills twigs.

Varieties susceptibility: All varieties are susceptible but to varying degree. Butte and Wood Colony are the most susceptible, Carmel, Fritz and Monterey are moderately susceptible and Aldrich & Nonpareil are the least susceptible.

Management: In orchards with high disease pressure, a two-spray program is recommended- one spray at pink bud stage (5-10% bloom) and the other at full bloom. However, in most years and in most orchards, one application at 80% to full bloom should be sufficient, while in wet years a



Early morning dew on almond bloom in February. On susceptible varieties such conditions coupled with high daytime temperatures can favor disease. (Photo: Gurreet Brar, UCCE)

third application at petal fall may be necessary. If there are prolonged wet periods at bloom, leave no more than 10 days between sprays.

Fungicides: Some recommendations by the UC IPM are: Benzimidazole (FRAC 1), dicarboximide (FRAC 2), anilinopyrimidine (FRAC 9), DMIs (FRAC 3) and strobilurins (FRAC 11).



Developing almond nut damaged by green fruit rot. (Photo : Jack Kelly Clark, UCCE)

Jacket rot or Green fruit rot:

Causal organism: *Botrytis cinerea*, *Sclerotinia sclerotiorum* and *Monilinia laxa*.

Infects: Senescing petals and anthers during later part of the bloom. Can spread to flower jacket, which then wither and stick to developing fruit.

Could lead to rotting of entire nut cluster.

Varieties susceptibility: Carmel, Price, Avalon are most susceptible. Also, other varieties with tight clusters are susceptible. Nonpareil can also be affected if rain persists during later part of bloom.

Management: In wet conditions with extended bloom, fungicide application at full bloom should help in preventing jacket rot. Make sure the chosen fungicide is effective against all potential pathogens. DMIs (FRAC number 3) are not recommended for spraying for this disease, as they are not effective against *Botrytis*.

Shot hole:

Causal organism: *Wilsonomyces carpophilus*

Infects: Leaves, branches and nuts. Forms a small circular lesion on the affected tissue, which eventually turns dark brown and falls off leaving a small hole, resembling a shot-hole, hence the name. Can cause leaf and fruit drop if severe.

Varieties susceptibility: All varieties are susceptible. Overwinters on the tree.

Management: Fungicides recommended for control of other bloom time diseases also control shot-hole, therefore if bloom time sprays are properly timed, this disease can be properly managed.

Anthracnose:

Causal organism: *Colletotrichum acutatum*

Infects: Branches and nuts. Develops as orange-pinkish lesions on young nuts, nuts exude gum.

Fungus persists within woody tissue, creating inoculum for several years if not controlled aggressively.

Management: If disease persists in the orchard, several years of good spray program may be required to clean up the infections. Also, extensive pruning of the diseased wood will be needed. Fungicide sprays are effective in controlling the disease, but in wet years sprays are needed every 7-10 days to contain infections from spreading.

Fungicides: DMI (FRAC 3) and Strobilurin (FRAC 11) fungicides are very effective.

Rust:

Causal organism: *Tranzchelia discolor*

Infects: Mainly leaves, although twig lesions can also be seen, though rare. Small yellow spots on upper side of the leaves and rusty red specks on the lower surface when the rust colored spores erupt through the surface on the lower side. Spores spread through air.

Management: If you have a history of rust in your orchard, apply fungicides 5 weeks after petal fall and follow with a late spring or summer application. Fungicides must be sprayed before symptoms appear, for effective control.

Fungicides: Sulfur or Maneb application 5 weeks after petal fall to start off good management program. A QOI fungicide (FRAC number 11) is recommended for a follow-up late spring or summer application.

Vertebrate pests: Pocket gophers and ground squirrels are active all year round, however, you may see heightened activity in the spring. Look out for the mound building activity of gophers. They can be controlled by using traps, poison baits and fumigation. A combination of two methods is usually recommended like using traps and baiting as some gophers can become bait shy or trap shy. For gopher control fumigation with smoke of gas cartridges is not effective as they quickly seal off their burrows when they detect smoke. However, using aluminum phosphide for fumigation has been

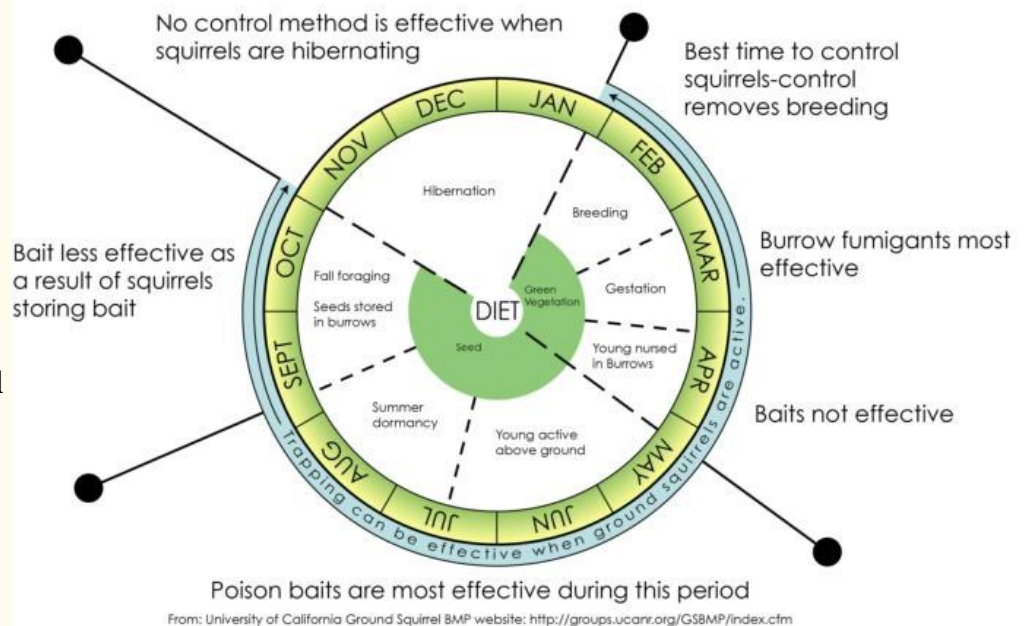
found to be effective in gopher control.

Locating the burrows is extremely important for starting any control measure for gophers. Use a metal rod probe to find burrows. First, locate the fresh mounds. Fresh mounds are the plugged openings of their lateral tunnels. Probe around one foot distance from the plug side of the mound by pushing the pointed metal rod probe into the ground repeatedly. You will feel that you hit the burrow when the probe drops suddenly like it hit a hollow spot.

For baiting, Strychnine based bait is commonly used for control of gophers. Bait applicators are available to increase application efficiency over a large area. For setting traps correctly, please visit the UC IPM page for gopher management here: <http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7433.html>

Management for ground squirrels is usually more difficult than the gophers. The squirrels hibernate during the winter months so any control strategies during that time are not as effective. However, in the spring they are breeding and the control program is most effective at that time. Fumigation has been found to be most effective during the month of March. In spring baits are not effective because the squirrels feed mostly on fresh vegetation. In summers again, control may be difficult due to the squirrels hibernating deep in tunnels because of summer heat. For detailed information on ground squirrel biology and management, visit this webpage: http://ucanr.edu/sites/Ground_Squirrel_BMP/

California Ground Squirrel - Calendar of Management



Pistachios:

In pistachios, carry out the delayed dormant sanitation activities. It is the time when you prune the trees. When pruning look for *Botryosphaeria* cankers. Evaluate pistachio buds or small twigs for presence of *Botryosphaeria*, the fungus that causes panicle and shoot blight in pistachio. Infected buds can develop shoots with black circular spots of 1-2 mm in size. These symptoms can also develop on rachises and leaves. Consider dormant bud sampling (BUDMON) to determine resident populations, especially if damage from *Botryosphaeria* was high this past year.

Evaluating mummy nuts for navel orange-worm (NOW) infestation is important during dormant and delayed dormant season. Therefore, counting mummy nuts and if more than two mummy nuts remain per tree, knocking them down before February 1 was recommended in our dormant season pest management guidelines. Remember that in pistachio, NOW infestation significantly increases risk of aflatoxin contamination, therefore

care must be taken to reduce NOW damage.

You should have done a weed survey after harvesting to assess and identify the weeds present. You can apply post-emergence herbicides, alone or in combination with pre-emergence herbicides. Remember that a good weed control program aids your IPM program. Many weeds harbor harmful pests as well, therefore controlling potential insect population buildup by limiting weed growth now can save you time and money later in the season.

Also, keep an eye on mound-building activity of pocket gophers. Treatments like traps or poison baits can be used in spring if necessary.

Walnuts:

Based on your scale and mite monitoring during the dormant period, treat according to UCIPM guidelines if a treatment is needed. Usually natural enemies can be relied upon to keep walnut scale populations under check. However, insecticide applications may disrupt the biological control agents, which can cause the scale populations to build up. If the monitoring indicates need for treatment, spray during the delayed dormant period before shoot growth begins. If the dormant season monitoring indicates high degree of parasitization, you can delay treatments until late spring when the crawlers emerge. In May, you can put a double-sided sticky tape around branches to monitor for emerging crawlers.

Get ready to place codling moth pheromone traps in mid-March to determine time of moth emergence. Refer to walnut pest management guidelines on UCIPM website to employ management strategies for codling moth.

Look out for any crown gall in the orchard but wait to treat the galls until spring when it gets hot and is no longer wet in the orchard because moisture favors the spread of the bacterium.

Announcements

UC Fruit and Nut Research and Information Center

presents

'Advances in Walnut Production' Short Course

Dates: Nov. 16-19, 2015

Time: All day

Location: Activities & Recreation Center (ARC), UC Davis Campus

Details: This 4 day course, held on the UC Campus will provide the latest in walnut orchard management & production.

Registration will open soon.

Would you like to receive weekly Evapotranspiration forecast for almonds this summer?

We at the UC Cooperative Extension office in Fresno are planning to share weekly ET forecast for the week ahead, so that you can schedule your irrigation more efficiently and in a timely manner.

If you are interested in receiving a weekly email, please send an email to gurbrar@ucanr.edu and we will add you to our email list.

Thanks,

Gurreet Brar

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Use of phosphite-containing products in 2015

A memo from California Pistachio Research Board

You may have heard that there are concerns about the use of phosphite-containing materials on tree nuts in the US and are quite understandably confused. I am writing to you to address the confusion and prepare you for discussions you may need to have with the processor to whom you deliver your pistachios. After reading this, **please discuss any potential use of phosphite in 2015 with your processor before purchase and application.**

Why is there concern about the usage of phosphite-containing crop inputs in tree nuts?

The European Union (EU) has changed the definition of phosphite to a pesticide and there is no pesticide maximum residue limit (MRL) to cover the phosphite residues in tree nuts in the EU. The default MRL is only 2 parts per million (ppm). In contrast, phosphite is residue exempt in the US and applications are commonly made with this in mind. Consequently, the use pattern in the US and the MRL in the EU are in potential conflict and the use of phosphite containing products may cause trade issues in the EU.

How important is the EU market to California tree nuts?

30% of almonds, 25% of pistachios and some 10% of walnuts are exported to the EU, to the tune of \$2.2 billion in 2013.

What is phosphite?

There are many names to specify different molecular forms of the element phosphorus. Phosphite is short for the PO₃ anion – its acid is phosphorous acid. In Europe the term phosphonate is used. We are not talking about phosphate (PO₄) or phosphoric acid – a necessary fertilizer and building block of all life. We also are not talking about phosphine, a widely

used fumigant, or phosphide rodenticides. We are talking only about phosphite/phosphonate and phosphorous acid.

Phosphites can show up in multiple forms as crop inputs: As a fertilizer/plant nutrient, phosphite is attached to potassium, calcium, copper, etc. It may not show up specifically as a constituent of the fertilizer but labels usually say that the P is obtained from phosphorous acid. Most fertilizers have P in the phosphate form. Brand names frequently contain “-phite” or “-fite” in their name but not always. Potassium phosphite is also registered and sold as fungicide. And there are some forms that are sold as adjuvants to stabilize the pH in spray solutions.

Phosphite is also a component of the fungicide fosetyl-Al (Aliette™). There are too many products to provide a comprehensive list of phosphite-containing materials so you should consult your PCA, crop consultant, and chemical salesman.

Why are phosphite-containing products used in tree nuts and other crops?

There are a variety of reasons for using the products, depending on the crop and the grower. Phosphites are used for both tree nutrition as well as root health reasons. Depending on the formulation it can help provide micronutrients to trees. In addition to its nutrient properties, phosphite is effective at promoting root growth as well as providing protection against certain root diseases including *Phytophthora*.

Thus, some phosphite products are sold as fertilizers, while others are registered as fungicides.

How are phosphite-containing products applied?

Phosphite-containing products are most commonly applied as foliar sprays, but can also be applied as a soil drench or added to irrigation water.

Are we sure there will be residues, especially since we spray the outside of the nuts or apply to the soil?

All three California tree nuts have had samples tested for phosphite residues and found samples where the limit exceeded the EU default MRL of 2 ppm. Our whole awareness of the issue arose when a German state lab tested some US walnuts in late 2013 from a retail shelf and reported fosetyl-Al residues (actually just phosphite residues were detected) exceeding the limit. The large retailer initiated a voluntary recall – something no one likes to see happen.

Phosphite readily moves inside the plant – both in the xylem and phloem – meaning it is systemic. This is great in one sense because foliar applications can help with root health issues. But in the current context, it is not so great because the residues are not simply on the outside of the nut, they are inside.

Doesn't phosphite readily breakdown into phosphate or other products?

Based on the information we have reviewed we have seen no evidence that it quickly breaks down inside the plant, and it doesn't quickly convert to phosphate either. However there is limited data.

Are there any times phosphite can be applied and not leave residues?

We don't know because until now there has been no reason to worry about phosphite residues. As fertilizer products, residues are not regulated. And the products that are registered as fungicides in the US, the EPA has exempted from a tolerance because of their low toxicity. So, no one has any residue data for

tree nuts to know how timing, type of application and/or rate affects the residue levels. Thus, at the moment no recommendations can be made for how to apply and still meet the low EU MRL.

What has the industry done about the issue?

For one the California tree nut industries along with the EU trade were able to convince the EU to set a temporary MRL of 75 ppm for tree nuts and several other crops.

Doesn't that solve the issue?

No, the temporary MRL expires December 31, 2015 and the MRL reverts to 2 ppm. Any 2015 crop sold to the EU or on the retail shelf in the EU after January 1, 2016 can't have residue exceeding 2 ppm.

So while the EU temporary MRL covered any phosphite usage in 2014, the EU expects the 2015 crop to meet their low pesticide residues limits for phosphites.

It takes at least 4 years to get the necessary residue data from field trials and to shepherd the data package through the EU regulatory process to establish a proper MRL.

Why did the EU make this regulatory change in the classification of phosphite?

We are not entirely sure of all the reasons, but it seems to be primarily a desire to have clear cut regulatory authority. It was not done because of health concerns about phosphite: neither the European Food Safety Authority (EFSA) nor EPA have found any dietary risks of concern. Matter of fact, EPA has exempted potassium phosphite from a needing a tolerance because of low toxicity.

What else is being done to resolve the issue?

A couple of things are being done jointly by almonds, walnuts and pistachios.

- We are asking growers, PCAs and handlers to help provide samples with known phosphite treatment histories (or not as a control) to the DFA lab in Fresno to better understand the range of residue levels and what treatments are associated with what kinds of residues (contact the CPRB for details. Contact information above).
 - o The study is also working with labs in the EU to sort out some questions about the analytical methodology
- The groups have successfully obtained two TASC grants from USDA-FAS to help fund the research mentioned above, as well as to help fund residue trials to obtain the necessary data for setting a phosphite MRL in the EU for tree nuts. However, it takes at least 4 years to get the necessary residue data from field trials and to shepherd the data package through the EU regulatory process to establish a proper MRL.

- We continue to work with the US government to ask the EU for the time to establish proper MRLs and continue the temporary MRL until then. However, we just are not certain whether our requests will be successful, thus the warning to tree nut growers that the use of phosphite-containing crop inputs might cause a trade issue for nuts exported to the EU.

What are the alternatives to phosphites and what are the consequences?

There are a wide range of non-phosphite containing products for fertilization and many growers have never used phosphites. Potential consequences likely vary with the crop and the specific growing environment. Growers should consult with their PCAs or crop consultant for advice on alternatives and consequences.

(Bob Klein, Manager, California Pistachio Research Board, 4938 East Yale Avenue, Suite 102, Fresno, CA 93727; Phone: 559-255-6480))

'From the Shell' is produced by UCCE Nut Crops Farm Advisor Gurreet Brar. Contact him for further information, or to be added to the e-mail list, at (559) 241-7515; or e-mail: gurbrar@ucanr.edu

Contents

- Almond Symposium Announcement
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