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Submitted by:

Gurreet Brar
Farm Advisor,
Fresno &
Madera
Counties

New Nut Crops Farm Advisor Arrives



Hi, I am Gurreet Brar, the new University of California Cooperative Extension (UCCE) Farm Advisor (Nut Crops) for Fresno and Madera Counties. Before joining UCCE in January 2013, I completed my Ph.D. in Horticultural Sciences at the University of Florida, Gainesville. Earlier, I earned my MS in Pomology and BS in Agriculture from Punjab Agricultural University, Ludhiana, Punjab, North India. I believe that among the three pillars of a land grant university, extension is an extremely important component when it comes to feeding and clothing the world's growing population. Bringing the best in farm research straight to your orchard will be my primary goal. UCCE research and extension programs are focused on the overall development of production systems for nut crops. In the past, I have worked with farmers, writing about their issues and helping them find solutions to production issues. Going out in the field and talking to growers is what I enjoy most.

I was born and raised in Punjab, the cradle of one of the first agricultural settlements, the Indus Valley Civilization. Just like the Central Valley of California, Punjab is one of the most agriculturally productive regions of the world. I am very excited to be a part of the UC Cooperative Extension system and I'm looking forward to serving your information needs regarding Almond, Pistachio and Walnut crops. My contact information is: 1720 S. Maple Ave, Fresno, CA 93702, Ph: **559-600-7218**. On Tuesdays, I will be at UCCE Madera office at: 328 S. Madera Ave, Madera, CA 93637, Ph: **559-675-7879**, Ext. 7209.

I wish you a very productive year and look forward to years of mutually rewarding experiences.



Honey Bees and Colony Strength Evaluation – an Online Training Program



Shannon Mueller, UCCE Farm Advisor in Fresno County, has just completed an online training program covering honey bees and colony strength evaluation procedures. It is available at <http://ucanr.edu/colonystrength>. When you first visit the site, you must enter a user name and password to access nine individual modules on honey bees and strength inspection. Some of the information is very basic while other modules are more technical in nature. The length of individual modules ranges from 3 to 25 minutes. Quizzes following the modules test your understanding and you can practice your skill in estimating brood area and frame coverage in other sections. The training is available at no charge, thanks to the Almond Board of California and Project *Apis m.* who helped sponsor the project. This training will help beekeepers, growers, and apiary inspectors better understand the colony strength evaluation process and use consistent methods that will produce more uniform results.

Almond Bloom Time Diseases

David Doll, Farm Advisor, UCCE Merced

Almond orchards are usually treated once or more during bloom for prevention of fungal diseases. These diseases include Brown Rot, Jacket Rot, Shot-hole, and Anthracnose. Flowers, flower parts, and young nuts are susceptible to infection, and often serve as the primary point infection for these diseases. Lack of properly timed sprays can provide the opportunity for a large amount of infections. These epidemics create lingering disease issues which will cause orchard loss for the present and future cropping years.

Brown rot, *Monilinia fructicola*, infects the petals, pistils, and stamens of the almond flower. Upon infection, it moves into the woodier tissues of the tree, killing branches and forming cankers. All varieties are susceptible to brown rot, but they vary in their degree of susceptibility. Butte, Mis-

sion, and Wood Colony are the most susceptible; Carmel, Sonora, Fritz, and Monterey are moderately susceptible, while Aldrich, Nonpareil, and Peerless are the least susceptible. Brown Rot Blossom blight is usually controlled with a pink bud and full bloom treatments. Many of UCCE trials indicate that the full bloom treatment is the most important. A third petal fall spray may be necessary in years favorable to disease, especially if bloom is strung out and the weather is wet and rainy. A good rule to follow is that no more

than ten days should elapse between treatments in wet weather.

A few growers have indicated that they do not spray for brown rot. This may be possible if good conditions persist through bloom AND the varieties planted are not very susceptible to infection (i.e. Nonpareil). It is important to note that not spraying can lead to a serious disease epidemic: a conventional Butte orchard that missed a full bloom spray had over 50% brown rot blossom infection despite no rain! There are many fungicides available for brown rot control, some recommendations to consider include Benzimidazole (FRAC 1), dicarboximide (FRAC 2), anilinopyrimidine (FRAC 9), DMIs (FRAC 3) and strobilurins (FRAC 11).



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Fungal canker from Brown Rot, *Monilinia fructicola*. Cankers serve as survival structures for the pathogenic fungi and need to be removed to reduce disease pressure.

The fungi, *Botrytis cinerea* and *Sclerotinia sclerotiorum*, can infect the jacket of the almond and kill the young fruit as well. This is called Jacket Rot or Green Fruit Rot. Infection occurs from flower opening to petal fall, but consistent rain increases disease.

Varieties that are susceptible include Merced, Carmel, Price, Avalon, or any variety with tight clusters. Nonpareil can be affected by this disease if rain and cool weather occur during petal fall. DMI fungicides (FRAC 3) are NOT recommended for jacket rot prevention as they do not provide effective control of *Botrytis*.

Shot-hole, *Wilsonomyces carpophilus*, forms a small circular lesion that eventually falls from the tree, leaving a small hole in the tissue. It can infect leaves, branches, and nuts. If severe enough, it can cause leaf and

fruit drop. Overwintering within the leaf buds of the tree, this pathogen is pretty common, and all varieties are susceptible. All fungicides recommended for application during bloom for control of other diseases control shot-hole, thus its appearance within orchards is often minimal even in wet years if properly timed sprays are made.

Anthracnose, *Colletotrichum acutatum*, is a very aggressive pathogen of almond. Infecting and killing branches and nuts, it reduces yield for multiple years. Anthracnose can be diagnosed by orange to pinkish lesions on young nuts, angular leaf lesions, and nuts that exude gum-balls. Upon infection, the fungus persists

within the woody tissues. This often requires pruning to remove the diseased wood, or several years of an aggressive spray program to clean up the lingering infections. Sprays are effective in controlling the disease, but in rainy, warm conditions, they are needed every

7-10 days in order to prevent infection. DMI (FRAC 3) and Strobilurin (FRAC 11) fungicides are very effective.

Combating resistance: The use of FRAC numbers was created to help determine the mode of action of the varying fungicides. One class of fungicide may be sold under several different trade names. For example, FRAC 3 is sold as Bumper, Tilt, Elite, Indar, Laredo, and Quash. In order to prevent fungicide resistant pathogens, back-to-back applications of any one FRAC group should be avoided.



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Symptoms of anthracnose on almond include blossom blight and fruit infections (see above). Management strategies may include spraying as early as the pink bud stage.

The formation of fungicide resistance by many pathogens is inevitable. Employing resistant strategies such as fungicide rotation can delay resistance formation. Often, fungicide cost decreases after the product comes off company patent. If the product and its generics are still effective against the diseases present after patent expiration, then the fungicide will become a cheaper option for use. Also, having more available active chemistries for the targeted fungi leaves more “tools in the toolbox” for disease management.

Recently, there have been a large amount of fungicides entering the market. Most of these “new” fungicides are combinations of chemistries with currently used mode of actions. Examples include Pristine (FRAC 7/11), Luna Sensation (FRAC 7/11), Inspire Super (FRAC 3/9), Distinguish (FRAC 9/11), Quadris Top (FRAC 3/11) and Quilt Xcel (FRAC 3/11). These fungicides contain multiple compounds in attempts to help reduce the chance of resistance. They provide excellent control of bloom time and

summer diseases – including alternaria, rust, and scab. Plan to use these strong fungicides to target the optimal timing of scab, rust, or alternaria. After applying one of these fungicides, make sure to rotate away from both of the FRAC groups used.

Please note that this is not an endorsement for any of the trade names listed, nor does the omission of specific trade names reflect the view of the author. Refer to your local chemical dealer or manufacturer for specific fungicide products available.

IPM Operations for February

Gurreet Brar,
Farm Advisor (Nut Crops)
Fresno & Madera Counties

As you are reading this article, bloom is underway. Remember, effective almond pollination will result in greater yields. UC studies have shown that between 2-2.5 eight frame hives per acre are needed for maximum set in this time of unstable weather.

Recent research suggests that application of IGRs like diflubenzuron to control peach twig borer (PTB) at bloom may be harmful to honey bee brood. Nevertheless, bloom is the right time to examine limb crotches and tree trunks to determine when PTB larvae start emerging from overwintering hibernacula. If a spray is needed, an insecticide application at bloom should be avoided and other alternative control timings should be considered (see press release page 5).

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.

Prior to bloom, evaluating mummy nuts for navel orangeworm (NOW) infestation is important



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- counting mummy nuts and if more than two mummy nuts remain per tree, knocking them down before February 1. 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.

To monitor San Jose Scale put up pheromone traps between February 25 and March 1. Use these traps and degree-days to predict the crawler stage. Place sticky tape in the trees in April to catch crawlers when they hatch. Also, keep an eye on mound-building activity of pocket gophers. Treatments like traps or poison baits can be used in spring if necessary.

Careful monitoring of the disease threats early on is the best way to deal with potential orchard health problems later in the season. To assist the growers in fungal disease management, University of California publishes a Fungicide Efficacy Guide that can help you select the right material and the proper timing of application for the most effective disease control. The guide is available at <http://www.ipm.ucdavis.edu/PDF/PMG/fungicideefficacytiming.pdf>

New Information on Insecticide Applications during Bloom and Honey Bee Brood

The almond industry recognizes the essential role bees play in sustaining the global food supply and has invested more money in bee research than any other U.S. commodity. This research is being used on an ongoing basis in the improvement of Best Management Practices for both growers and beekeepers. This memo outlines new information and provides an overview of Best Management Practices for insecticide applications during bloom to minimize possible impact on honey bee brood. New data suggest some insecticides may impact honey bee brood (developing larvae).

In a move away from dormant sprays that can have negative environmental impacts, almond growers and pest control advisors have been using alternate application timings with softer bio-rational insecticides. These have been tank mixed with fungicides during bloom to control peach twig borer and obliquebanded leaf roller.

Insecticide residues may be picked up with the almond pollen, which is taken back to the hive by foraging bees and fed to bee larvae. The impact on larvae is not fully known. Therefore as a guide, applications of insecticides during bloom should be avoided until more is known about the impact on bee larvae. Future studies will help clarify the impact of insecticides on bee larvae under field conditions. Based on several studies, the one exception to this noted below is *Bacillus thuringiensis* (B.t.) Kurstaki. Fortunately, there are several alternative options and these are covered by [UC IPM Online](http://www.ipm.ucdavis.edu/PMG/r3300211.html) (<http://www.ipm.ucdavis.edu/PMG/r3300211.html>). These include:

Delayed dormant: Insecticides like Dimilin (diflubenzuron), Intrepid (methoxyfenozide) and Altacor (chlorantraniliprole - rynaxypyr)

Bloom*: *Bacillus thuringiensis* (B.t.) Kurstaki applied twice during bloom between popcorn and full bloom and at petal fall. The Kurstaki strain is selective for Lepidoptera-like peach twig borer and is safe for honey bees. However, application of any pesticide when pollen is available and bees are foraging **should** be avoided.

Spring sprays: Numerous insecticide options

* Disease protection during bloom is important and fungicide applications are needed in many growing situations. Nevertheless, minimizing exposure of bees and pollen to any spray by avoiding applications when pollen is available and bees are foraging. This normally is best accomplished by spraying after mid-afternoon and at night. Information and guidelines can be found in the booklet "[2012 Efficacy and Timing of Fungicides, Bactericides and Biologicals for Deciduous Tree Fruit, Nut, Strawberry, and Vine Crops](http://www.ipm.ucdavis.edu/PDF/PMG/fungicideefficacytiming.pdf)" (<http://www.ipm.ucdavis.edu/PDF/PMG/fungicideefficacytiming.pdf>) on the UC IPM website, and "[Honey Bees and Agricultural Sprays](http://almondboard.com/Growers/Documents/Bee-Protection.pdf)" (<http://almondboard.com/Growers/Documents/Bee-Protection.pdf>) on the Almond Board website.

If you have any questions or comments about this information, please contact the Almond Board of California: Bob Curtis (rcurtis@almondboard.com, 209.604.0385) or Gabriele Ludwig (gludwig@almondboard.com, 209.765.0578).

Save the Date

The San Joaquin Sustainable Farming Project, UCCE and UC IPM present:
**Alfalfa, Almond & Cotton Winter Meeting:
 Pest & Crop Management, Water & More!**

Wednesday, February 27th, 2013

2:00 pm to 4:30 pm

Andrew Firebaugh Community Center, 1655 13th Street, Firebaugh

PROGRAM

Key Pests and Control Strategies in Alfalfa, Almonds & Cotton

Dr. Larry Godfrey, UC Davis/UCCE, Entomologist

David Haviland, UCCE Kern Co. Farm Advisor, Entomologist

Dan Putnam, UC Davis/UCCE, Alfalfa Specialist

Bloom Time, Spring and Summer Disease Control for Almonds

David Doll, UCCE Merced, Pomologist, Almond Advisor

Overview of Chlorpyrifos use in CA– Human Health and Environmental Concerns

Brian Leahy, CA Dept. of Pesticide Regulation, Director

San Joaquin Valley Watershed Update

Chris Linneman, Westside SJV Watershed Coalition, Engineer

Bring your questions!

Win \$\$\$ to Home Depot!!

All attendees are entered into a raffle to win great prizes!

CE Credits

1.0 hrs. Laws & Regs

1.5 hrs. Other

Questions?

Marcia Gibbs

San Joaquin Sustainable

Farming Project

(530) 370-5325

marcia@sustainablecotton.org

The funding for this project has been provided through an agreement with the State Water Resources Control Board and the US Environmental Protection Agency– Clean Water Act Section 319

From the Shell

The Nut Crops Newsletter for Fresno and Madera Counties

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I hope you find this newsletter informative and useful. I will try to cover relevant topics in each issue. However, if there are problems affecting your farming business that you would like to have covered, please send me an e-mail, a letter or give me a phone call.

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Subscriptions to the print version are available for \$12 per year (6 issues). Please complete the subscription form below.

Thank you for your support.

Sincerely,

Gurreet Brar
 Nut Crops Farm Advisor,
 Fresno and Madera Counties

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For additional questions regarding 'From The Shell' please contact Terri at 559-600-7285.

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'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) 600-7218; or e-mail: gurbrar@ucanr.edu

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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 559-600-7285 if you have any barriers to participation requiring accommodation.

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