

ALMOND GROWER NEWSLETTER January 5,

2015

Bee Update

U.S. bees continue to be plagued by numerous problems. The parasitic varroa mite, and the viruses it transmits, continues to be the major problem. Mite control costs have shot up now that there is only one supplier for *Amitraz*, the main chemical control. Diminished bee forage is a significant concern, with formerly good bee pasture in the plains states being replaced by corn and soybeans. California's drought has forced some CA beekeepers to seek summer pasture in other states, but the number of good locations is limited. Most beekeepers in the plains states had a good honey crop this year (mainly from clover and canola) but a late honey-flow prevented some from applying mite treatments in a timely manner. Like every year, the condition of the bee supply for almonds won't come into focus until sometime in January. (For a positive piece on honey bees check out *The Fall and Rise of the Honey Bee Peter Borst*).

Sorting and Grading Bees

January is probably the busiest month for our beekeepers. In order to meet our 8-frame standard, they must go through all their colonies and cull out those that don't make the grade. Our reputation in the bee industry is that we are tough on grading. As a result, many beekeepers don't want to and will not work with us; those that do work with us feel that the premium price for their bees is worth the extra work. If they didn't bail out after the first year, once beekeepers are familiar with our program, we rarely have a problem. Some of our beekeepers have been with us for 20+ years, and have never been docked for sub-par colonies.

Sorting and grading bees is an onerous task for beekeepers. Colony strength in a typical large bee yard of 400 colonies falls into a bell-shaped distribution - maybe 1/3 at 8 frames, 1/3 well below 8 frames and 1/3 well above 8 frames. We will accept an occasional 6-frame colony since that colony could have lost bees between the time the beekeeper inspected it and the time we looked at it in your orchard. What we don't like to see is 2 to 4 frame colonies, since they don't have enough field workers to provide good pollination. That 2 frame colony could be next to a 15-frame colony, and a beekeeper can argue that the average is there and they should get paid for all their colonies as long as a load averages 8-frames.

We get about half our bees from southern California and half from states to the north. California beekeepers have fewer problems grading bees since they can do so during our mild winters. Northern-state beekeepers (including CA beekeepers that take their bees to the Dakotas in the summer) don't like to move bees to California until just before almonds bloom since their bees are in a low-metabolism (hibernation) state, that preserves colony

populations by extending the life span of worker bees (if moved to central California too early, colonies lose field bees to non-productive flights searching for flowers). Some beekeepers put their colonies in cold-storage sheds in December, pull them out in January then grade them just before placing them in almond orchards (we allow grading in the orchards as long as the grading is completed before the trees start blooming).

Some beekeepers simply don't have (or won't take) the time to grade their almond bees. They deliver field-run bees. They assure growers that their bees are good and that the grower is not obligated to pay for any colony he is not happy with. We have considered renting "field-run" bee colonies at a discounted price but have not done so because such a program would require 100% inspection of colonies in order to be fair to both the grower and the beekeeper. When bee colonies are uniformly strong, as ours normally are, a 10% inspection is sufficient.

Fungicide sprays

Many feel that fungicide sprays are not a significant problem for bees because you don't see lots of dead bees in front of hives after a spray. Bee brood (larvae) can be damaged if the larvae consume pollen that contains fungicides – such damage might not show up for several weeks. Also, recent work indicates that some fungicides increase the bee toxicity of other chemicals, including chemicals that beekeepers place in their hives to control mites. Timely release of bees when no pollen remains in your orchards will minimize potential problems from petal-fall sprays. Bees greatly expand their foraging radius (up to 3 miles) during petal fall and can be damaged by insecticide sprays on other crops, esp. weevil sprays on alfalfa (weevil spraying on alfalfa occurs remarkably close to or with petal fall on almonds, year in and year out; there is no bloom on alfalfa, but blooming weeds on older stands, as well as drift, can be a problem).

IGRs (Insect Growth Regulators) can also do a number on bees -- resist the temptation to throw an IGR into the fungicide spray tank. The USDA's Frank Eischen has shown that bee activity on almond bloom ceases for up to 24 hours after a fungicide spray (your no-spray neighbor might appreciate the temporary use of your hard-working bees). You're paying top-dollar for bees, so why not get maximum use out of them? For more information check out the 1- page Quick Guide from the Almond Board at www.almonds.com/beeBMPs

Bee Research

In 2014 we collected \$2/colony (\$1 each from growers and beekeepers) for bee research on the 36,582 colonies we rented to almond growers. The funds were distributed as follows: Project ApisM: \$51,700 (various projects), Dr. Frank Eischen: \$13,475 (labor for almond-bee studies), Randy Oliver: \$8,000

(bee health). Bee information can be found at bee www.projectapism.org and Randy Oliver's site www.scientificbeekeeping.com Research donations are accepted at these sites. Project ApisM also provides seeds for bee forage._____

Almond Flowers - How Many are Set?

Frank Eischen has determined that there are 4.6 to 9.8 million almond flowers/acre (Nonpareil is at the lower end Butte & Padre at the upper for the year tested). There are 400 nuts/lb, so there are 1.2 million nuts/acre in a 3000#/ac. crop, 1.6 million for 4000#/ac and 2 million for 5000#/ac. - 5000# crops have been reported but are quite rare. *Sidebar: I was skeptical when it was recently reported that it takes 1 gallon of water for every almond produced, but the figure is correct (assume a 3000#/ac. crop that uses 3+ acre feet of water annually - do the math). With a 1500#/ac. crop, you jump to 2 gallons of water per nut - a figure high enough to get the attention of the water police.*

4500#/acre is close to the upper limit of what almond trees can hold - most growers would be very happy with a 4000# crop (for many, anything over 3000# is gravy). In most years, setting 25% to 30% of blossoms in an orchard will give yields in the 4000+#/ac. range but only if those pollinated almonds remain on the tree. Once the bees have set 30% of the flowers (and strong colonies will do the job at a stocking rate of 1.5 colonies/acre or less unless weather confines them to their hives) ample post-bloom sunlight is necessary to retain the pollinated nuts. An extended period of overcast weather after petal fall will cause some pollinated nutlets to drop due lack of food (photosynthates) from leaves. If post-bloom sunlight is adequate, the ball is then in the grower's court - optimum orchard management is required to bring the crop home by minimizing nutlet drop. For example, if a grower was unable to apply a post-harvest irrigation the previous fall, his chances of getting a 4000# crop are slim to none, even if the bees set 100% of the flowers. Other vital orchard inputs are irrigation (and gypsum application if water infiltration is sub-par), potassium, ample sunlight (determined by planting distance) and, of course, disease, insect and pest control.

Pollen collecting honey bees do most, if not all the pollination of almonds and, unless the bees are confined to their hives by weather, they will collect most of the available pollen by early afternoon. Walk your orchard after 2PM during full bloom; if no pollen remains on the flowers, you may be able to reduce the number of bee colonies you rent.

Dr. Eischen's flower data brings up an interesting question: in a year with a heavy set of flowers (9.8 million/acre) should a grower use more bees than in a light-flower year (4.6 million/acre); or, should he use more bees in a light-flower year, to make sure every flower is set. Off the cuff answer: it probably doesn't make any difference, as the bees should set enough flowers to give a 4000# crop in either case. A light flower set is cause for concern, as the trees might be signaling that they lack sufficient food reserves to produce

abundant flowers – if such is the case, they may also lack sufficient reserves to minimize post-bloom nutlet drop.

Dueling Headlines

You've likely seen stories along the lines of *Water-hogging almond orchards contribute to California's water woes* (although many other crops use the same amount of water as almonds). A different story, using the same set of data, could be *Almond orchards maximize the productivity of limited California farmland*.

Shafter Research Station

Project ApisM now has a presence at the Shafter Research Station: 12 bee colonies (provided by local beekeeper/broker Mike Mulligan) and a room/office. Station manager Greg Palla gave PaM a generous discount on rental of this space.

History Note

In sorting through my files recently I ran across a 1979 Newsletter that tried to explain the reason for the heavy drop of pollinated nutlets after ideal 1979 bloom weather. I blamed the lack of a post-harvest irrigation as a major cause, as outlined in the attached portion of our April 12, 1979 Newsletter.

Prior to 1979, winter rains were the first post-harvest water most orchards received. I felt considerable trepidation at encouraging a post-harvest irrigation in 1979 because it flew in the face of UC recommendations at that time. Subsequent UC studies showed that a post-harvest irrigation is indeed very important for almonds. I like to think that my Newsletter put these studies on a fast(er) track, but *quien sabe?*

Just Wondering

Have UCLA football coach Jim Mora and Blue Diamond CEO Mark Jansen ever been seen in the same room at the same time?

We'll be in Touch

We'll contact you later this month to schedule bee deliveries or, give us a call anytime. Giving us a 2 week window for bee deliveries, as you have in the past, is a HUGE help.

Best wishes for continued rain -- snow in the Sierras -- in the coming months (except for 2 days during full bloom). And best wishes for a bountiful 2015 almond crop.

Joe Traynor

