

Almond PMA Notes and Summary of Dormant Season Monitoring

Trying times. I've heard a few growers say they are cutting costs this year by skipping a dormant spray or using fewer inputs in general. Whether it's higher costs for fuel, fertilizer and crop protection, lower prices paid to growers, water shortages or all of this and more coming together, the dynamic nature of farming, as we all know, keeps growers on their toes. To help ease through these transitions, we can do things like fine-tune our irrigation practices, monitor soil- and plant-water status and utilize information from automated weather stations like CIMIS or prescription services to schedule irrigations. We can also follow a good IPM program and monitor for pests and beneficials in the orchard in order to make more informed treatment decisions. My neighbor yelled over from his orchard one day, "Hey, are you farming with a clipboard?" Well, yes I was. In this case it was my own small scale attempt at precision farming, but the point is, any time spent out in the orchard measuring and monitoring, collecting weather data, or just observing can be time well spent and money saved. You might just find that you *can* skip that spray and still be ok.

Navel orangeworm, scale and mites in the dormant season. A goal of the Almond PMA project is to help almond growers make environmentally responsible pest management decisions. During an earlier phase of the project (1998-2005), the economic success of reduced risk practices was demonstrated and a protocol for year-round monitoring was established that includes treatment thresholds for important almond pests. This information is compiled in a brochure, *A Seasonal Guide to Environmentally Responsible Practices in Almonds* which is available for purchase online at <http://anrcatalog.ucdavis.edu> and at the local Cooperative Extension office. It is also available in its various parts for free download at <http://ucipm.ucdavis.edu>. Monitoring, as described in the *Seasonal Guide* begins in the dormant period with winter sanitation to remove mummy nuts.

Mummy nuts are overwintering sites for navel orangeworm. USDA and UC research has shown that removing mummy nuts to fewer than 2 per tree, along with early harvest will effectively control navel orangeworm. This may be the only treatment needed unless there is navel orangeworm pressure from neighboring orchards. In January (or any time after the leaves have fallen), walk through each block and count mummies in 20 trees to see how clean the orchard is. If counts are high, you may need to pole, collect, and crack out 100 tree mummies and look for worms. If worm counts are high, you should consider shaking or poling the block to remove more mummy nuts. Rain and fog help with mummy nut removal. Birds remove nuts and worms. It could help to remove bird control devices (scarecrows, reflective tape, balloons, shopping bags) for the dormant season and reapply them later with the new crop. Blowing the mummy nuts into the orchard middles and destroying them with a flail mower can make mummy nut removal even more effective. Blowing is an extra expense but we are often mowing at this time of year to prepare for bloom and for frost control.

As you walk through the block counting mummies, also collect 100 (total) spurs from the same 20 trees or from known scale or mite hot spots. Examine these for live scale (San Jose scale and European fruit lecanium) and overwintering mite eggs (brown almond mite, European red mite). These can be viewed with good eyes but it's easier with a hand lens and easier yet with a binocular microscope. Don't panic when you do find these pests once you start looking at spurs. You will notice many dead scale, some winter killed and some that have been parasitized (evidenced by

an emergence hole in the waxy covering). Also, small populations of brown almond and European red mites can serve as an important early food source for mite predators that will then move on to the more destructive webspinning spider mite species later in the season. Consider a dormant treatment with oil if over 20% of the spurs (presence/absence sampling) are found with any one species of live scale or mite eggs, keeping the species separate. It may be an easy call and you can stop looking after 20 spurs, especially if you know what to look for. Continue looking until you feel confident. If over 60% of the spurs are found with live scale or mite eggs, treat with oil and a suitable insecticide. Counting and sampling should take less than an hour per 20-acre block. Cracking out mummy nuts and looking at spurs should take about as long. Results from my Jan 2009 mummy nut counts and spur sampling appear in the table below.

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DateSampled	Orchard	Block	Varieties	Mummies/tree	Infested mummy nut %		Infested spur %			
					Ground	Tree	LiveSJS	ParasitizedSJS	EFL	MiteEggs
1/8/2009	San Joaquin A	1	Nonpareil, Carmel, Monterey	1.075	6	13	1	0	0	0
1/13/2009	San Joaquin B	1	Nonpareil, Sonora, Monterey	0.65	6	7	2	5	0	8
1/13/2009	San Joaquin B	2	Nonpareil, Aldrich, Monterey	0.825	0.5	7	15	7	0	2
1/13/2009	San Joaquin B	3	Nonpareil, Carmel, Monterey	0.9	4	7	7	9	0	28
1/29/2009	San Joaquin C	1	Nonpareil, Carmel, Fritz	11.6	0	1	0	0	0	6
1/26/2009	Merced	1		2.175	2	11	1	9	19	5
1/26/2009	Merced	2		1.2	1	5	54	23	12	14

Notes (San Joaquin A): I split the office/shop orchard roughly into an east and a west half for the spur sampling and mummy nut counting. As you can see (and as you probably already know) the orchard is pretty clean. It took me about 2 hours to find 200 nuts (100 from the trees, 100 from the ground) on 2-Feb. I understand the young organic block out in Farmington is no longer organic.

Notes (San Joaquin B): Mummy nut counts were low (some blocks I counted before they were mummy knocked). Some San Jose scale (< 20%) and mite eggs (European red mite, > 20%).

Notes (San Joaquin C): I collected spurs in the variety trial only. Observed no scale and only 3 spurs with mite eggs (brown almond mite), well below the 20% treatment threshold (UC IPM treatment guidelines). There was a high mummy-nut count in both the variety trial and the younger block (UC IPM recommends less than 2 per tree) but I most likely included some hard-shell varieties in my survey and only 1 nut out of 200 I cracked out (100 picked off trees and 100 picked from the orchard floor) contained any navel orangeworm.

Notes (Merced): I surveyed the 40 acres south of Bear Creek Dr. (the block with microsprinklers) and the triangle north of Bear Creek Dr. I split each into an east half (~20 acres) and west half (~20 acres) for the mummy counting and spur sampling. For the nut crackout, I picked 100 nuts off the ground and 100 mummies from the trees (what I could reach with a ~5' long sucker) from each 40-acre block. There was much evidence of scavenging by birds in the NE triangle (bordering the creek). I did not venture into the southernmost block (Woodland Ave. side). I was there sampling about 4 hours (~1 hr/20 acres) and crackout and microscope work took about an equivalent amount of time (just for the record).