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Almond Year-Round IPM Program
Annual Checklist

Supplement to UC IPM Pest Management Guidelines: Almond

These practices are recommended for a monitoring-based IPM program that enhances pest control and reduces environmental quality problems related to pesticide use.

Water quality becomes impaired when pesticides and sediments move off-site and into water. Air quality becomes impaired when volatile organic compounds move into the atmosphere. Each time a pesticide application is considered, review the Pesticide Application Checklist at the bottom of this page for information on how to minimize water quality problems.

This year-round program covers the major pests of almond. Details on carrying out each practice, example monitoring forms, and information on additional pests can be found in the guidelines. Track your progress through the year with the annual checklist form.

The following example forms are available for record keeping on the UC IPM Web site www.ipm.ucdavis.edu/PMG/ under "Almond":

- Dormant spur sampling of San Jose scale, European fruit lecanium, and mites
- Insects monitored using pheromone traps and degree-days
- Spring weed survey
- Navel orangeworm egg trap
- Ant colony monitoring
- Webspinning spider mites monitoring
- Fall weed survey

✓ Done	**Dormant/delayed dormant season activities** Mitigate pesticide usage to minimize air and water contamination.
	Count mummy nuts in orchard. • If more than 2 nuts per tree remain, knock off and destroy mummy nuts to reduce navel orangeworm and brown rot before February 1.
	Manage orchard floor vegetation: • After harvest, assess weeds present and identify those that were not controlled by a fall preemergent treatment (if applied). • Keep records. In January, consider applying postemergent herbicides in tree row strips alone or in combination with preemergents.
	Take a dormant spur sample for scale and mite eggs mid-November to mid-January. • Record results. • Treat if needed according to PMG.
	Examine trees for peach twig borer hibernacula in the crotches of one-year-old wood. Consider treatment for peach twig borer with environmentally sound material or delay treatment until bloom.
	In orchards with varieties that retain leaves, monitor rust for possible spring treatment.
	Other pests you may see: • Armillaria root rot (oak root fungus): mushrooms emerge during wet periods. • Pocket gophers (mound-building activity).

✓ Done	**Bloom to postbloom period activities** Mitigate pesticide usage to minimize air and water contamination.
	Manage navel orangeworm: • Be sure mummies are off trees by February 1. • Disc or flail mow mummies by March 15. • Put out egg traps: ▪ *Central and southern San Joaquin Valley* by March 15 ▪ *Northern San Joaquin and Sacramento valleys* by April 1
	Monitor peach twig borer: • Put up pheromone traps by March 20 and check according to PMG. • Record results.
	When rainy conditions promote disease, time fungicide treatment according to PMG for: • Anthracnose • Brown rot • Jacket rot • Leaf blight • Rust (if overwintered lesions on retained leaves) • Scab
	Monitor for shot hole fruiting structures in leaf lesions as long as weather is wet. • Treat if needed according to PMG.
	Monitor San Jose scale: • Put up pheromone traps by March 1 and check according to PMG. • Record results.
	Start to monitor for spider mites when mites are first seen in the lower center tree canopy. • Treat if needed according to PMG.
	Monitor for vertebrates and manage as necessary. • Gophers • Ground squirrels • Voles
	Other pests you may see: • Bacterial canker • Brown mite • European red mite • Forest tent caterpillar • Fruittree leafroller (possible nut drop) • Leaffooted plant bug (possible nut drop) • Obliquebanded leafroller
	Manage orchard floor vegetation: • Mow ground cover before bloom for frost protection and to remove competing bloom.

✓ Done	**Fruit development period activities (late April to start of shaking)** Mitigate pesticide usage to minimize air and water contamination.
	Monitor shoot strikes for peach twig borer and Oriental fruit moth, examining strike to properly identify species. • Treat if needed according to PMG.
	Monitor San Jose scale: • Pheromone traps are useful for detecting male scales and parasites.
	Monitor navel orangeworm egg traps: • Keep records. • Treat if needed according to PMG.
	Monitor ant mounds (once during April-May) • Keep records. • Treat if needed according to PMG.
	Monitor spider mites: • Keep records. • Treat if needed according to PMG.
	Take leaf samples in July to make sure that nitrogen levels do not favor hull rot.
	Monitor for and treat if needed according to PMGs: • Alternaria • Rust • Scab
	Assess weeds in late spring: • Identify uncontrolled weeds to plan future management strategies. • Keep records of monitoring. • Continue to maintain ground cover short.
	Other pests you may see: • Armillaria root rot (dying trees) • Band canker (2nd to 6th leaf trees) • Brown mite • Ceratocystis canker • European red mite • Leaffooted bugs • Obliquebanded leafroller • Peach silver mite • Peachtree borer • Silver leaf • Stink bugs • Tenlined June beetle (where soils are very sandy)
	Identify beginning of hull split; regulate irrigation during hull split to manage hull rot.

✓ Done	Harvest
	Harvest early to avoid third generation navel orangeworm eggs and to minimize hull rot.
	Assess trunk damage to evaluate shaker/harvest operation for bark injury.
	Pick up nuts promptly to avoid ant damage.
	Take harvest sample to determine pest damage. • Store sample in freezer until nuts are cracked open for observation.

✓ Done	Postharvest
	Look for nuts or leaves stuck on trees well after harvest, indicating hull rot or San Jose scale.
	Monitor for rust lesions. Manage according to PMG.
	After fall rain begins, monitor for shot hole leaf lesions with fruiting structures. • Manage according to PMG.
	If use of preemergent herbicide** in rows is planned, time it properly.
	Survey weeds: • Record results. • If use of preemergent herbicide in rows is planned, time it properly.
	Don't bother to seed a cover crop unless you have sparse resident vegetation.

✓ Done	**Pesticide application checklist
	When planning for possible pesticide applications in an IPM program, review and complete this checklist to consider practices that minimize environmental and efficacy problems. ✓ Choose a pesticide from the UC IPM Pest Management Guidelines for the target pest considering: ▪ Impact on natural enemies. ▪ Potential for water quality problems using the UC IPM WaterTox database. (For more information, see http://www.ipm.ucdavis.edu/TOX/simplewatertox.html.) ▪ Impact on aquatic invertebrates. (For more information, see *Pesticide Choice,* UC ANR Publication 8161, http://anrcatalog.ucdavis.edu/pdf/8161.pdf) ▪ Chemical mode of action if pesticide resistance is an issue. ✓ Select an alternative chemical or nonchemical treatment when risk is high. ▪ Choose sprayers and application procedures that keep pesticides on target. ▪ Identify and take special care to protect sensitive areas (for example, waterways or riparian areas) surrounding your application site. ▪ Review and follow label for pesticide handling, storage, and disposal guidelines. ▪ Check and follow restricted entry intervals (REI) and preharvest intervals (PHI). ▪ After an application is made, record application date, product used, rate, and location of application. Follow up to confirm that treatment was effective. ✓ Consider water management practices that reduce pesticide movement off-site. (For more information, see UC ANR Publication 8214, *Reducing Runoff from Irrigated Lands: Causes and Management of Runoff from Surface Irrigation in Orchards,* http://anrcatalog.ucdavis.edu/pdf/8214.pdf) ▪ Install a tailwater recovery system for recirculating water if flood irrigating. ▪ Limit irrigation to amount required by evapotranspiration (ET). Use soil moisture or stem water potential monitoring to confirm water status. ▪ Consider vegetative filter strips or ditches to moderate winter rainfall runoff if resident vegetation is inadequate. (For more information, see *Vegetative Filter Strips*, UC ANR Publication 8195, http://anrcatalog.ucdavis.edu/pdf/8195.pdf) ▪ Redesign inlets into tailwater ditches to reduce erosion. ✓ Consider management practices that reduce air quality problems. • When possible, choose pesticides that are not in emulsifiable concentrate (EC) form which release volatile organic compounds (VOCs). VOCs react with sunlight to form ozone, a major air pollutant.