

Nectarine Year-round IPM Program *(Reviewed 6/10)*

ANNUAL CHECKLIST

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 (VOCs) 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 nectarines. Details on carrying out each practice and information on additional pests can be found in the guidelines. Track your progress through the year with the annual checklist form. All photo identification pages and example monitoring forms can be found online at: <http://www.ipm.ucanr.edu/FORMS/>

✓ Done	Dormancy to delayed-dormancy Mitigate pesticide effects on air and water quality.		
	Apply fungicide treatments as needed according to PMGs: <ul style="list-style-type: none"> • Peach leaf curl • Shot hole disease 		
	Manage orchard floor vegetation: <ul style="list-style-type: none"> • Survey weeds and keep records (example form available online). • Manage weeds with pre- or postemergence herbicides or nonchemically in organic orchards. • Mow any resident vegetation very close to ground. 		
	Make an oil treatment for scales and European red and brown mite eggs. <ul style="list-style-type: none"> • If you saw increasing damage from scales last year, take a dormant shoot sample to see if an insect growth regulator should be added to the oil treatment. 		
	Treat peach twig borer and obliquebanded leafroller with environmentally sound material or delay treatment until bloom.		
	Other pests you may see: <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> • Armillaria root rot • Fruittree leafroller egg masses • Pocket gophers </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> • Stink bugs • Tree borers • Voles </td> </tr> </table>	<ul style="list-style-type: none"> • Armillaria root rot • Fruittree leafroller egg masses • Pocket gophers 	<ul style="list-style-type: none"> • Stink bugs • Tree borers • Voles
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✓ Done	Bloom (green tip to petal fall) Mitigate pesticide effects on air and water quality.
	Put out pheromone traps for: <ul style="list-style-type: none"> • Oriental fruit moth (February 15) • Omnivorous leafroller (February 20) • San Jose scale (February 25) Check traps and keep records (<i>example form available online</i>).
	If using mating disruption for oriental fruit moth, place dispensers in orchard after first moth is caught but no later than March 5.
	Examine flower clusters and leaves for: <ul style="list-style-type: none"> • Western flower thrips • Katydid • Peach twig borer • Fruittree leafroller • Obliquebanded leafroller

✓ Done	Bloom (green tip to petal fall) Mitigate pesticide effects on air and water quality.
	Monitor for other pests, including stink bugs and plant bugs, as well as known invasive pests (spotted wing drosophila, light brown apple moth).
	When rainy conditions promote disease, time fungicide treatment according to PMGs: <ul style="list-style-type: none"> • Brown rot at 20 to 40% bloom and full bloom. • Jacket rot treatment at full bloom. • Powdery mildew treatment at petal fall. • Scab, if orchard has a history of this disease.
	Monitor for diseases: <ul style="list-style-type: none"> • Rust <ul style="list-style-type: none"> ◦ Monitor twig cankers beginning late March. ◦ Treat with fungicide if needed according to PMG. • Shot hole <ul style="list-style-type: none"> ◦ Fruiting structures in leaf lesions as long as weather is wet. ◦ Manage if needed according to PMG.
	Observe the orchard for vertebrates and manage as necessary: <ul style="list-style-type: none"> • Gophers • Ground squirrels
	Other pests you may see: <ul style="list-style-type: none"> • Armillaria root rot (oak root fungus) • Bacterial canker • Phytophthora crown and root rot

✓ Done	Fruit development (petal fall to harvest) Mitigate pesticide effects on air and water quality..
	Put up pheromone traps for: <ul style="list-style-type: none"> • Peach twig borer (March 20) • Obliquebanded leafroller (April 15)
	Continue to monitor for western flower thrips through jacket drop.
	Monitor shoot strikes for damage from oriental fruit moth and peach twig borer. <ul style="list-style-type: none"> • Keep records (example form available online). • Manage if needed according to PMGs.
	If wet weather persists, continue to monitor for rust: <ul style="list-style-type: none"> • Manage if needed according to PMG.
	If orchard has a history of scab: <ul style="list-style-type: none"> • Treat 3 weeks after full bloom. • Treat again 2 weeks later if scab was severe the previous year.

✓ Done	Fruit development (petal fall to harvest) Mitigate pesticide effects on air and water quality..
	Take sweep samples in orchards and adjacent crops and weedy areas, beginning from early April to early June for: <ul style="list-style-type: none"> • Plant bugs (<i>Lygus</i> and <i>Calocoris</i>) • Katydid • Stink bugs Manage if needed according to PMG.
	Sample fruit damage every other week after color break.
	Monitor powdery mildew and treat if needed according to PMG.
	Manage orchard floor: <ul style="list-style-type: none"> • Survey weeds and keep records (example form available online). • Spot treat weeds if needed according to PMG.
	Monitor spider mites from late April through August: <ul style="list-style-type: none"> • For best evaluation, conduct two 5-minute searches and record results (<i>example form available online</i>). • Manage if needed according to PMG.
	Select leaf samples in late June through July to analyze for nutrients. Pay particular attention to nitrogen, potassium, and some of the micronutrients such as zinc and boron. <ul style="list-style-type: none"> • Take 60 to 80 mid-shoot leaves from moderately vigorous fruiting shoots.
	If rain is predicted during the last 4 weeks before harvest, treat for ripe fruit rot.
	Other pests you may see: <ul style="list-style-type: none"> • Armillaria root rot • Bacterial canker • Black peach aphid • Peach silver mite • Phytophthora root and crown rot • Scab • Tree borers • Verticillium wilt

✓ Done	Harvest Mitigate pesticide effects on air and water quality.
	Monitor for ripe fruit rot and treat if rain is predicted.
	Take a harvest sample to determine pest damage (<i>example form available online</i>).

✓ Done	Postharvest Mitigate pesticide effects on air and water quality.
	In early harvest orchards continue to watch for: <ul style="list-style-type: none"> • Shoot strikes to determine if oriental fruit moth populations are building. • Webspinning spider mites.
	Remove fruit remaining in trees to reduce brown rot inoculum and prevent shoot death.
	If surface water runoff is an issue, particularly near waterways, consider the use of cover crops or resident vegetation.

✓ Done	<h2 style="margin: 0;">Pesticide application checklist</h2> <p>When planning for possible pesticide applications in an IPM program, consult the Pest Management Guidelines, and review and complete this checklist to consider practices that minimize environmental and efficacy problems</p>
✓ Choose a pesticide from the Pest Management Guidelines for the target pest, considering:	
	<ul style="list-style-type: none"> • Impact on natural enemies and pollinators. For more information see Protecting Natural Enemies and Pollinators at http://www.ipm.ucanr.edu/mitigation/protect_beneficials.html.
	<ul style="list-style-type: none"> • Potential for water quality problems using the UC IPM WaterTox database. See www.ipm.ucanr.edu/TOX/simplewatertox.html.
	<ul style="list-style-type: none"> • Impact on aquatic invertebrates. For more information, see <i>Pesticide Choice</i>, UC ANR Publication 8161 (PDF), http://anrcatalog.ucdavis.edu/pdf/8161.pdf.
	<ul style="list-style-type: none"> • Chemical mode of action, if pesticide resistance is an issue. For more information, see <i>Herbicide Resistance: Definition and Management Strategies</i>, UC ANR Publication 8012 (PDF), http://anrcatalog.ucdavis.edu/pdf/8012.pdf.
	<ul style="list-style-type: none"> • Endangered species that may be near your site. Find out using the Department of Pesticide Regulation's PRESCRIBE program. (http://www.cdpr.ca.gov/docs/endspec/prescint.htm)
✓ Before an application	
	Ensure that spray equipment is properly calibrated to deliver the desired pesticide amount for optimal coverage. See www.ipm.ucanr.edu/training/incorporating-calibration.html .
	Use appropriate spray nozzles and pressure to minimize off-site movement of pesticides.
	<p>Avoid spraying during these conditions to avoid off-site movement of pesticides.</p> <ul style="list-style-type: none"> • Wind speed over 5 mph • Temperature inversions • Just prior to rain or irrigation (unless it is an appropriate amount, such as when incorporating a soil-applied pesticide) • At tractor speeds over 2 mph
	Identify and take special care to protect sensitive areas (for example, waterways or riparian areas) surrounding your application site.
	Review and follow labeling for pesticide handling, personal protection equipment (PPE) requirements, storage, and disposal guidelines.
	Check and follow restricted entry intervals (REI) and preharvest intervals (PHI).
✓ After an application	
	Record application date, product used, rate, and location of application.
	Follow up to confirm that treatment was effective.

✓ Done	Pesticide application checklist
	✓ Consider water management practices that reduce pesticide movement off-site.
	Consult relevant publications:
	<ul style="list-style-type: none"> • <i>Reducing Runoff from Irrigated Lands: Orchard Floor Management Practices to Reduce Erosion and Protect Water Quality</i>, UC ANR Publication 8202 (PDF), http://anrcatalog.ucdavis.edu/pdf/8202.pdf.
	<ul style="list-style-type: none"> • <i>Reducing Runoff from Irrigated Lands: Causes and Management of Runoff from Surface Irrigation in Orchards</i>, UC ANR Publication 8214 (PDF), http://anrcatalog.ucdavis.edu/pdf/8214.pdf.
	<ul style="list-style-type: none"> • <i>Protecting Surface Water from Sediment-Associated Pesticides in Furrow-Irrigated Crops</i>, UC ANR Publication 8403 (PDF), http://anrcatalog.ucdavis.edu/pdf/8403.pdf.
	Consult the Department of Pesticide Regulation Groundwater Protection Program (GWPA) Web site for pesticide information and mitigation measures. (http://www.cdpr.ca.gov)
	Install an irrigation recirculation or storage and reuse system. Redesign inlets into tailwater ditches to reduce erosion.
	Use drip rather than sprinkler or flood irrigation.
	Limit irrigation to amount required using soil moisture monitoring and evapotranspiration (ET). For more information, see <i>Reducing Runoff from Irrigated Lands: Understanding Your Orchard's Water Requirements</i> , UC ANR Publication 8212 (PDF), http://anrcatalog.ucdavis.edu/pdf/8212.pdf .
	Consider using cover crops.
	Consider vegetative filter strips or ditches. (For more information, see <i>Vegetative Filter Strips</i> , UC ANR Publication 8195 (PDF), http://anrcatalog.ucdavis.edu/pdf/8195.pdf .)
	Apply polyacrylamides in furrow and sprinkler irrigation systems to prevent off-site movement of sediments.
	✓ Consider practices that reduce air quality problems.
	When possible, reduce volatile organic compound (VOC) emissions by decreasing the amount of pesticide applied, choosing low-emission management methods, and avoiding fumigants and emulsifiable concentrate (EC) formulations.
For more about mitigating the effects of pesticides, see the Mitigation page.	