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Avocado Year-Round IPM Program Annual Checklist

Supplement to UC IPM Pest Management Guidelines: Avocado

These practices are recommended for a monitoring-based IPM program that reduces water quality problems related to pesticide use. Water quality becomes impaired when pesticides move off-site and into water. Each time a pesticide application is considered, review the Pesticide Application Checklist at the bottom of this form.

This program covers the major pests of Avocado. Details on carrying out each practice and information on additional pests can be found in the guidelines. Track your progress through the year with this annual checklist form. Color photo identification sheets and examples of monitoring forms can be found online at: <http://www.ipm.ucdavis.edu/PMG/C008/m008yiformsphotos.html>.

✓ Done	Bloom period (pre-bloom, open flower, pollination, and fruit set) Mitigate pesticide usage to minimize air and water contamination.**
	Monitor for diseases and conditions that promote disease development. <ul style="list-style-type: none"> • Armillaria root rot • Avocado root rot • Dothiorella and Phytophthora cankers • Sunblotch Manage if needed according to PMGs.
	Monitor invertebrate pests, including: <ul style="list-style-type: none"> • Avocado thrips, (February or March, then regularly from April until fruit exceed 3/4 inch). • Caterpillars (March through August). • Greenhouse thrips (late-March through July). • Persea mite and sixspotted mite (April through October). Manage if needed according to PMGs.
	Survey weeds, especially weeds near trunks, during spring through fall. <ul style="list-style-type: none"> • Record results (<i>example form available online</i>). Manage vegetation if needed, especially weeds near trunks.
	Look for vertebrates, especially during spring and summer. Manage if needed.
	Promote pollination of flowers: <ul style="list-style-type: none"> • Place honeybee hives in groves during bloom. • Manage pesticides to avoid killing bees.
	Provide proper cultural care and good growing conditions to improve fruit yield and control pests.
	Apply gypsum and mulch to reduce avocado root rot and improve soil.
	Manage irrigation: <ul style="list-style-type: none"> • Inspect irrigation systems by late winter. • Monitor and adjust scheduling to meet trees' varying water needs. • Test irrigation water quality.

✓ Done	Early fruit development—fruit are less than 2 inches long Mitigate pesticide usage to minimize air and water contamination.**
	Identify and manage the causes of damage to fruit.
	Monitor for diseases and conditions that promote disease development. <ul style="list-style-type: none"> • Armillaria root rot • Avocado root rot • Dothiorella and Phytophthora cankers • Sunblotch Record the date and location of problem trees or sites. Manage if needed according to PMGs.
	Monitor invertebrate pests, including: <ul style="list-style-type: none"> • Avocado thrips (in February or March, then regularly from April until fruit exceed 3/4 inch.) • Caterpillars (March through August) • Greenhouse thrips (late-March through July) • Persea mite and sixspotted mite (April through October) • Avocado brown mite (about August through October) Record results (<i>example form available online</i>). Manage if needed according to PMGs.
	Look for other invertebrate pests. Manage if needed according to PMGs.
	Provide proper cultural care and good growing conditions to improve fruit yield, reduce insect damage, and control pests.
	Look for vertebrates, especially during spring and summer. Manage if needed.
	Survey weeds, especially during spring through fall. <ul style="list-style-type: none"> • Record results (<i>example form available online</i>). Manage vegetation, especially weeds near trunks, as needed.
	Manage irrigation: <ul style="list-style-type: none"> • Monitor and adjust scheduling to meet trees' varying water needs.



✓ Done	Late fruit development–fruit are greater than 2 inches long Mitigate pesticide usage to minimize air and water contamination.**
	<p>Monitor for diseases and conditions that promote disease development, including:</p> <ul style="list-style-type: none"> • Armillaria root rot • Avocado root rot • Dothiorella and Phytophthora cankers • Sunblotch <p>Manage if needed according to PMGs.</p>
	<p>Monitor invertebrates:</p> <ul style="list-style-type: none"> • Caterpillars (March through August) • Persea mite and sixspotted mite (April through October) • Avocado brown mite (about August through October) • Other species (about August through October)
	Look for vertebrates, especially during spring and summer. Manage if needed.
	Reduce pest problems and manage tree growth by proper pruning.
	<p>Manage nutrition:</p> <ul style="list-style-type: none"> • Test foliar nutrients and fertilize if needed.
	Provide proper cultural care and good growing conditions to improve fruit yield and control pests.
	<p>Apply frost protection when warranted through March, especially if growing on flat land.</p> <ul style="list-style-type: none"> • Test frost control system by November.
	Inspect trees or sample foliage or soil during late summer or fall before winter rains to assess salinity from alkaline soils, poor quality water, and fertilizers.
✓ Done	Harvest until fruit arrives at the packing house Mitigate pesticide usage to minimize air and water contamination.**
	Check preharvest intervals for all products used**.
	Use pruning and other cultural practices to minimize anthracnose in groves and fruit rots postharvest.
	<p>Size pick fruit. Thin clustered fruit and prune to reduce protected sites, thereby culturally controlling greenhouse thrips, leafrollers, loopers, and mealybugs:</p> <ul style="list-style-type: none"> • Thin by selectively harvesting only larger fruit, which increases market price to the grower.
	Minimize fruit injury and postharvest disease.
	Educate and supervise workers regarding fruit handling Best Management Practices (BMP), Good Agricultural Practices (GAP), and food safety.
	Inspect fruit quality before bins are moved from the picking site to identify grove areas where management practices need improvement.
	Take steps to prevent fruit contamination and theft.



✓ Done	**Pesticide application checklist
	<p>When planning for possible pesticide applications in an IPM program, review and complete this checklist to consider practices that minimize environmental and efficacy problems.</p> <ul style="list-style-type: none"> ✓ Choose a pesticide from the UC IPM Pest Management Guidelines for the target pest considering: <ul style="list-style-type: none"> ▪ Impact on natural enemies and honeybees. ▪ 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 <i>Pesticide Choice</i>, UC ANR Publication 8161, http://anrcatalog.ucdavis.edu/pdf/8161.pdf.) ▪ Chemical mode of action (based on efficacy, spectrum of activity, and pesticide resistance). Select an alternative chemical or nonchemical treatment when resistance risk is high. ✓ Before an application: <ul style="list-style-type: none"> ▪ 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: <ul style="list-style-type: none"> ▪ 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, <i>Reducing Runoff from Irrigated Lands: Causes and Management of Runoff from Surface Irrigation in Orchards</i>, http://anrcatalog.ucdavis.edu/pdf/8214.pdf.) <ul style="list-style-type: none"> ▪ Limit irrigation to amount required using soil moisture and evapotranspiration (ET) monitoring. ▪ Install an irrigation recirculation or storage and reuse system. ▪ Consider the use of cover crops. ▪ Consider vegetative filter strips or ditches. (For more information, see <i>Vegetative Filter Strips</i>, UC ANR Publication 8195, http://anrcatalog.ucdavis.edu/pdf/8195.pdf.) ▪ Install sediment traps. ▪ Use polyacrylamide (PAM) tablets in furrow irrigation systems to prevent off-site movement of sediments. ▪ Apply polyacrylamides in sprinkler irrigation systems to prevent runoff. ▪ Redesign inlets and outlets into tailwater ditches to reduce erosion. (For more information, see UC ANR Publication 8225, <i>Reducing Runoff from Irrigated Lands: Tailwater Return Systems</i>, http://anrcatalog.ucdavis.edu/pdf/8225.pdf.) ✓ Consider orchard floor management practices that improve soil structure and reduce erosion. (For more information, see UC ANR Publication 8202, <i>Orchard Floor Management Practices to Reduce Erosion and Protect Water Quality</i>, http://anrcatalog.ucdavis.edu/pdf/8202.pdf.) ✓ Consider practices that reduce air quality problems. ✓ When possible, choose pesticides that are not in an emulsifiable concentrate (EC) formulation, which release volatile organic compounds (VOCs). VOCs react with sunlight to form ozone, a major air pollutant.

