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# Pear Year-Round IPM Program
# Annual Checklist

***Supplement to UC IPM Pest Management Guidelines: Pear***

These practices are recommended for a monitoring-based IPM program that reduces water quality problems related to pesticide use. Track your progress through the year using this form.

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 page for information on how to minimize water quality problems. This program covers the major pests of pear. Details on carrying out each practice, information on additional pests, and additional copies of this form are available from the UC Pest Management Guidelines: Pear at http://www.ipm.ucdavis.edu/PMG/.

| ✓ Done | **Dormant/delayed-dormant season activities**<br>Special issues of concern related to environmental quality: dormant sprays, drift, and runoff. |
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| | Take beating tray samples for pear psylla adults. |
| | Examine dormant spurs for:<br>• European red mite eggs<br>• Pear rust mite and pearleaf blister mite<br>• Pear psylla eggs if sampling in February<br>Manage if needed according to PMGs. Also, note the presence of predatory mites. Examine shoots for San Jose scale and pear scab lesions. |
| | Look under bark for mealybugs. |
| | Manage orchard floor vegetation:<br>• North Coast: Eliminate weeds and ground cover before bloom in areas where frost and russetting are likely.<br>• Delta: Mow resident vegetation or cover crop before bloom. |
| | Monitor orchard temperatures and protect from frost, which can favor blossom blast. |

| ✓ Done | **Bloom season activities (red bud to petal fall)**<br>Special issues of concern related to environmental quality: drift, and runoff from rain. |
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| | Examine flower clusters for:<br>• Pear psylla eggs and nymphs<br>• European red mites<br>• Pear rust mites<br>• Caterpillars (green fruitworm, obliquebanded leafroller)<br>• Western flower thrips<br>• Mealybugs (grape, obscure)<br>• Western boxelder bug eggs and nymphs<br>Manage if needed according to PMGs. |
| | Place pheromone traps in the orchard for:<br>• Codling moth in late March for mating-disruption and conventional orchards<br>• Consperse stink bug in early April<br>• Obliquebanded leafroller in late April<br>Check traps and keep records (example form available online). |
| | If using mating disruption for codling moth, place pheromone dispensers in orchard at biofix. |
| | When weather conditions promote disease, time fungicide and antibiotic treatments as needed according to PMGs:<br>• Pear scab. Check leaves and emerging fruit for pear scab lesions 7 to 10 days after an infection period to assess the effectiveness of treatment.<br>• Fire blight |
| | Watch the orchard for vertebrates and manage as necessary:<br>• Gophers<br>• Ground squirrels<br>• Voles—at the base of young trees |
| | Observe the orchard for vertebrates and manage as necessary:<br>• Gophers<br>• Ground squirrels<br>• Voles—at the base of young trees |
| | In cold, wet weather note the presence of blossom blast. |

| ✓ Done | **Fruit development period activities (petal fall to harvest)**<br>Special issues of concern related to water quality: runoff from irrigation and drift. |
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| | Take weekly samples,<br>examine leaves for:<br>• Pear psylla eggs and nymphs<br>• European red mites and eggs<br>• Twospotted spider mites and predatory mites<br>• Pear sawfly (pear slug) eggs and larvae<br>• Aphids<br>• Katydids or feeding damage<br>• Pearleaf blister mite damage<br><br>examine fruit for:<br>• Pear rust mites at the calyx<br>• Mealybugs (grape, obscure) at the calyx<br>• Codling moth larva or damage<br>• Obliquebanded leafroller larva or damage<br>• Plant bug damage (boxelder, lygus, stink)<br>• Katydid damage after June 30<br><br>Manage if needed according to PMGs. |
| | Continue to monitor codling moth:<br>• At 800 to 900 degree-days from biofix.<br>• Continue monitoring traps.<br>• Check fallen fruit on the ground in early July.<br>Manage if needed according to PMG. |
| | Check cover crops and weeds for:<br>• Plant bugs (lygus, stink) Stink bugs<br>• Katydid nymphs<br>Manage if needed according to PMGs. |
| | Continue monitoring weather conditions during rattail bloom for fire blight. |
| | Manage orchard floor vegetation:<br>• Mow, cultivate, or apply** a postemergent herbicide to manage ground cover.<br>• Survey for escaped winter weeds and emerging annual and perennial summer weeds.<br>Keep records (example form available online). |
| | Note the presence of Armillaria root rot (oak root fungus). |

| ✓ Done | Harvest activities |
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| | Check fruit for feeding damage caused by:<br>• Codling moth<br>• Obliquebanded leafroller<br>• Plant bugs (boxelder, lygus, stink)<br>• Katydids<br>• Mealybugs (grape, obscure)<br>• Pearleaf blister mite<br>• Pear rust mite<br>• San Jose scale<br>• Pear scab lesions (primary or secondary)<br>• New or unusual damage or pests |
| | Continue checking codling moth traps through mid-September in mating-disruption and conventional orchards. |

| ✓ Done | Postharvest activities |
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| | Check top shoots for:<br>• Pear psylla nymphs and eggs<br>• Webspinning spider mites<br>• European red mite<br>• Pear rust mites<br>• Pearleaf blister mite damage on leaves<br>• Pear sawfly (pear slug)<br>• Pear scab lesions on leaves<br>Sample fruit left on tree for codling moth and/or damage. |
| | Manage orchard floor vegetation:<br>• Survey winter annual weeds and keep records (example form available online).<br>• Manage weeds in rows with pre- or postemergent herbicides or nonchemically.<br>• Consider seeding a cover crop by mid-October. |

| ✓ Done | **Pesticide application checklist |
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| | When planning for possible pesticide applications in an IPM program, review and complete this checklist to consider practices that minimize environmental and efficacy problems.<br>✓ Choose a pesticide from the UC IPM Pest Management Guidelines for the target pest considering:<br>▪ Impact on natural enemies.<br>▪ Potential for water quality problems using the UC IPM WaterTox database. (For more information, see http://www.ipm.ucdavis.edu/TOX/simplewatertox.html.)<br>▪ Impact on aquatic invertebrates. (For more information, see *Pesticide Choice,* UC ANR Publication 8161, http://anrcatalog.ucdavis.edu/pdf/8161.pdf.)<br>• Chemical mode of action if pesticide resistance is an issue.<br>✓ Select an alternative chemical or nonchemical treatment when risk is high.<br>▪ Choose sprayers and application procedures that keep pesticides on target.<br>▪ Identify and take special care to protect sensitive areas (for example, waterways or riparian areas) surrounding your application site.<br>▪ Review and follow label for pesticide handling, storage, and disposal guidelines.<br>▪ Check and follow restricted entry intervals (REI) and preharvest intervals (PHI).<br>▪ After an application is made, record application date, product used, rate, and location of application. Follow up to confirm that treatment was effective.<br>✓ 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.)<br>▪ Install an irrigation recirculation or storage and reuse system.<br>▪ Use drip rather than sprinkler or flood irrigation.<br>▪ Limit irrigation to amount required using soil moisture monitoring and evapotranspiration (ET).<br>▪ Consider vegetative filter strips or ditches. (For more information, see *Vegetative Filter Strips*, UC ANR Publication 8195, http://anrcatalog.ucdavis.edu/pdf/8195.pdf.)<br>• Redesign inlets into tailwater ditches to reduce erosion. (For more information, see *Tailwater Return Systems*, UC ANR Publication 8225, http://anrcatalog.ucdavis.edu/pdf/8225.pdf.)<br>• Consider your orchard's water requirements (For more information, see *Understanding Your Orchard's Water Requirements*, UC ANR Publication 8212, http://anrcatalog.ucdavis.edu/pdf/8212.pdf).<br>✓ Consider orchard floor management practices that improve soil structure and reduce erosion. (For more information, see *Orchard Floor Management Practices to Reduce Erosion and Protect Water Quality*, UC ANR Publication 8202, http://anrcatalog.ucdavis.edu/pdf/8202.pdf.)<br>• 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. |