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Wine/Raisin Grape Year-Round IPM Program Annual Checklist

Supplement to UC IPM Pest Management Guidelines: Grape

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.

Each time a pesticide application is considered, review the Pesticide Application Checklist at the bottom of this form for information on how to minimize water quality problems. This program covers the major pests of grape. Details on carrying out each practice, information on additional pests, and additional copies of this form are available from the UC IPM Pest Management Guidelines: Grape at <http://www.ipm.ucdavis.edu/PMG>.

This program applies only to wine and raisin grapes; it does not include information for table grapes. For **table grapes**, see the Table Grape Year-Round IPM Program.

✓ Done	Delayed-dormant period activities What should you be doing at this time?
	On a warm day, monitor vines and spurs for: <ul style="list-style-type: none">• Mealybugs• Ants associated with mealybugs and European fruit lecanium scale• Orange overwintering spider mites• Cutworm Keep records on a monitoring form. Treat** if needed according to the PMG.
	In coastal areas, check orange tortrix pheromone traps that were put up during the dormant period. <ul style="list-style-type: none">• Keep records on a monitoring form.
	Just before budbreak, put up omnivorous leafroller pheromone traps. <ul style="list-style-type: none">• Check traps twice weekly until a biofix date is established; thereafter, check traps weekly.• Keep records on a monitoring form.
	If sharpshooters are a problem in your area, set out sticky traps just before budbreak for: <ul style="list-style-type: none">• Glassy-winged sharpshooter In coastal regions near riparian and landscape areas: <ul style="list-style-type: none">• Blue-green sharpshooter Change traps weekly. Keep records on a monitoring form.
	Keep records of other pests or pest damage you may see. <ul style="list-style-type: none">• Rodents• Branch and twig borer• Click beetles• Bud beetles• <i>Eutypa</i>

✓ Done	Budbreak period activities What should you be doing at this time?
	On a warm day, monitor vines and spurs for: <ul style="list-style-type: none"> • Mealybugs • Ants associated with mealybugs and European fruit lecanium scale • Orange overwintering spider mites • Cutworm • Thrips Keep records on a monitoring form. Treat** if needed according to the PMG.
	Check pheromone traps for: <ul style="list-style-type: none"> • Omnivorous leafroller • Orange tortrix in coastal areas Keep records on a monitoring form.
	Monitor leaf wetness. Track powdery mildew ascospore release and mildew risk index. <ul style="list-style-type: none"> • Treat** if needed according to the PMG.
	Consider treating** for phomopsis cane and leaf spot if rain continues after budbreak.
	Remove vines that have spring symptoms of Pierce's disease.
	Check sticky traps for sharpshooters: <ul style="list-style-type: none"> • Glassy-winged sharpshooter In coastal regions near riparian and landscape areas: <ul style="list-style-type: none"> • Blue-green sharpshooter Change traps weekly. Keep records on a monitoring form.



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✓ Done	Rapid shoot growth period activities
	What should you be doing at this time?
	Look for thrips if cold weather persists.
	Look for spider mites and their natural enemies weekly on first-emerging leaves. <ul style="list-style-type: none"> • Map areas of concern for bloom monitoring.
	Monitor leafhoppers weekly starting a month after budbreak or whenever first nymphs appear. <ul style="list-style-type: none"> • Keep records on a monitoring form.
	Continue checking pheromone traps for: <ul style="list-style-type: none"> • Omnivorous leafroller • Orange tortrix in coastal areas Keep records on a monitoring form.
	In southern San Joaquin Valley, put up vine mealybug pheromone traps around April 1 and check every two weeks. <ul style="list-style-type: none"> • If males are caught or honeydew, sooty mold, or ants are found, look for female infestations on surrounding vines. • Keep records on a monitoring form. • Treat** if needed according to PMG.
	Monitor caterpillars if they have been a problem in the past: <ul style="list-style-type: none"> • Western grapeleaf skeletonizer • Grape leafroller • Orange tortrix in coastal vineyards • Omnivorous leafroller Map areas of concern for bloom monitoring.
	If European fruit lecanium scale has been a problem in the past, monitor female development on old wood.
	Manage ants if mealybugs and scale are a problem.
	Monitor sharpshooters: <ul style="list-style-type: none"> • Glassy-winged sharpshooter In coastal regions near riparian and landscape areas check for: <ul style="list-style-type: none"> • Blue-green sharpshooter Change sticky traps weekly. Keep records on a monitoring form.
	Monitor for flagging. If you see a flag, distinguish between <i>Botrytis</i> shoot blight and branch and twig borer.
	Monitor leaf wetness. Track powdery mildew ascospore release and mildew risk index. <ul style="list-style-type: none"> • Treat** if needed according to PMG.
	Survey weeds to plan a weed management strategy. <ul style="list-style-type: none"> • If herbicides** are used, use the late-spring weed survey form to record your observations and make pre- and postemergent herbicide selection decisions.
	Keep records of other pests or pest damage you may see: <ul style="list-style-type: none"> • Eutypa dieback • Phomopsis



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✓ Done	Bloom to veraison period activities
	<p>What should you be doing at this time?</p> <p>Monitor leafhopper and spider mites weekly.</p> <ul style="list-style-type: none"> • Keep records on a monitoring form. • Treat** if needed according to PMGs.
	<p>Monitor for <i>Botrytis</i> and powdery mildew by inspecting leaves and shoots.</p>
	<p>If European fruit lecanium scale has been a problem in the past, monitor for egg hatch to time treatment**.</p>
	<p>Check pheromone traps for:</p> <ul style="list-style-type: none"> • Omnivorous leafroller • Orange tortrix (in central coast areas) <p>Keep records on a monitoring form.</p>
	<p>In areas other than southern San Joaquin Valley, put up vine mealybug pheromone traps. In all areas, check traps every two weeks.</p> <ul style="list-style-type: none"> • If males are caught or honeydew, sooty mold, or ants are found, look for female infestations on surrounding vines. • Keep records on a monitoring form. • Treat** if needed according to PMG.
	<p>Monitor <i>Pseudococcus</i> mealybugs by looking for honeydew, sooty mold, and ant activity.</p> <ul style="list-style-type: none"> • Keep records on a monitoring form. • If you see crawlers, treat** if needed according to PMG.
	<p>To reduce possible summer rot, <i>Botrytis</i>, and leafhoppers, remove basal leaves or basal lateral shoots beginning around berry set.</p> <ul style="list-style-type: none"> • Time leaf pull before first-generation grape leafhoppers become adults. <p>Treat** for <i>Botrytis</i> prior to rain, if leaves are not removed.</p>
	<p>Monitor caterpillars if they have been a problem in the past:</p> <ul style="list-style-type: none"> • Omnivorous leafroller • Orange tortrix • Grape leafroller • Western grapeleaf skeletonizer <p>Keep records on a monitoring form.</p>
	<p>Monitor sharpshooters:</p> <ul style="list-style-type: none"> • Glassy-winged sharpshooter <p>In coastal regions near riparian and landscape areas check for:</p> <ul style="list-style-type: none"> • Blue-green sharpshooter <p>Change sticky traps weekly. Keep records on a monitoring form.</p>
	<p>Keep a record of other pests or pest damage you may see;</p> <ul style="list-style-type: none"> • Grasshopper • Whitefly



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✓ Done	Veraison period activities What should you be doing at this time?
	Monitor leafhoppers and spider mites weekly. <ul style="list-style-type: none"> • Keep records on a monitoring form. Treat** if needed according to PMGs.
	Check pheromone traps for: <ul style="list-style-type: none"> • Omnivorous leafroller • Orange tortrix in coastal areas Keep records on a monitoring form.
	Check vine mealybug pheromone traps. <ul style="list-style-type: none"> • If males are found, or if honeydew, sooty mold, or ant activity is found, look for female infestations on surrounding vines. • Educate field crew to flag cluster infestations for treatment. Treat** if needed according to PMG.
	Monitor grape and obscure mealybugs. <ul style="list-style-type: none"> • Keep records on a monitoring form. • If you see crawlers, treat** if needed according to PMG.
	Monitor sharpshooters: <ul style="list-style-type: none"> • Glassy-winged sharpshooter Check traps weekly. Keep records on a monitoring form.
	Look for vine symptoms of Pierce's disease.
	If rain occurs shortly after veraison, monitor for <i>Botrytis</i> .
	Monitor caterpillars if they have been a problem in the past: <ul style="list-style-type: none"> • Omnivorous leafroller • Orange tortrix • Grape leaffolder • Western grapeleaf skeletonizer Keep records on a monitoring form.
	Look on roots of weakened vines for galls or phylloxera.
	If necessary manage birds with netting or scare devices as fruit ripens.
	Keep a record of other pests or pest damage you may see. <ul style="list-style-type: none"> • Whitefly • European fruit lecanium • Grasshoppers



✓ Done	Harvest period activities What should you be doing at this time?
	Be aware that high populations of adult leafhoppers may interfere with hand harvesting.
	Monitor for grape, obscure, and vine mealybugs. <ul style="list-style-type: none"> • Look for cluster infestations and mark on map. • Educate harvest crew to flag cluster infestations of vine mealybug for treatment. • Treat** vine mealybug if needed according to PMG.
	If you have vine mealybug, steam sanitize equipment before moving to an uninfested area of the vineyard.
	For Pierce's disease: <ul style="list-style-type: none"> • Flag vines with symptoms for removal.
	If necessary, continue managing birds with netting or scare devices.
	Treat** for <i>Botrytis</i> prior to any anticipated rain.
	Sample soil and roots for nematodes; look at roots for galls and phylloxera.
	Monitor glassy-winged sharpshooter: <ul style="list-style-type: none"> • Check traps weekly and keep records on a monitoring form.

✓ Done	Postharvest period activities What should you be doing at this time?
	If necessary, treat** for vine mealybug immediately after harvest according to the PMG.
	To reduce risk of transferring vine mealybug, do not place winery pomace in the vineyard; compost pomace or cover piles securely with clear plastic.
	Look for symptoms of Pierce's disease on vines and flag for removal.
	Look for European fruit lecanium on leaves.
	If you desire a cover crop, seed after harvest.



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✓ Done	Dormant period activities What should you be doing at this time?
	Apply lime sulfur** for powdery mildew in areas other than Madera, Fresno, and Tulare counties.
	In coastal areas, set out orange tortrix pheromone traps by December. <ul style="list-style-type: none"> • Check traps twice weekly until a biofix date is established; thereafter, check traps weekly. • Keep records on a monitoring form.
	If present, treat** for Phomopsis cane and leaf spot before rainfall.
	Sample for nematodes in January or February.
	Carry out dormant-season sanitation activities: <ul style="list-style-type: none"> • Prune late in dormancy after rains to reduce wound infections. • Destroy prunings of older infested wood to reduce pest sources. • Remove dried grape clusters on vines and disc weeds and clusters where orange tortrix or omnivorous leafroller is a problem. • In vineyards with a history of branch and twig borers, examine old pruning scars and dead parts of vines for brown frass and wood dust. • If you have vine mealybug, steam sanitize equipment before moving to uninfested area of the vineyard.
	Survey weeds to plan a weed management strategy. <ul style="list-style-type: none"> • If herbicides** are used, use the late-winter survey form to record your observations and make pre- and postemergent herbicide selection decisions.



✓ 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. ▪ 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 if pesticide resistance is an issue. ✓ Select an alternative chemical or nonchemical treatment when risk is high. <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, 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"> ▪ Install an irrigation recirculation or storage and reuse system. ▪ Use drip rather than sprinkler or flood irrigation. ▪ Limit irrigation to amount required using soil moisture monitoring and evapotranspiration (ET). ▪ 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.) ▪ Redesign inlets into tailwater ditches to reduce erosion. ✓ Consider management practices that reduce air quality problems. <ul style="list-style-type: none"> ▪ 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.

