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Potato Year-Round IPM Program Annual Checklist

Supplement to UC IPM Pest Management Guidelines: Potato

These practices are recommended for a monitoring-based IPM program that reduces water and air 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. 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 form for information on how to minimize air and water quality problems. This program covers major pests in both commercial and seed potatoes in California. 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: Potato at <http://www.ipm.ucdavis.edu/PMG>.

✓ Done	Previous crop and preplanting Special issues of concern related to water quality: Soil fumigation, fertilizer application, and runoff.		
	Consider crop rotation for reducing pathogens, harmful nematodes, and problem weeds.		
	Manage weeds in the previous crop. <ul style="list-style-type: none"> ▪ Survey for weeds and keep records (example form available online). ▪ Also survey adjacent areas and crops for problem weeds, green peach aphid hosts and volunteer potatoes. ▪ Control volunteer potatoes. Avoid herbicides that leave residues harmful to potatoes.		
	Take soil samples to assay for nematodes immediately after harvest of previous crop.		
	Manage residue from the previous crop.		
	Manage weeds between crops. <ul style="list-style-type: none"> ▪ Irrigate to stimulate weed seed germination after previous crop, before field preparation. ▪ Cultivate or apply** preemergent herbicide as needed to control weeds. 		
	Analyze soil for fertility, physical constraints, and pH, which can affect common scab. Avoid over-fertilizing to reduce problems with early blight.		
	Watch for wireworms, especially if there is a history of damage. Treat** if needed according to PMG.		
	Consider soil fumigation for soilborne pests. <ul style="list-style-type: none"> ▪ Nematodes ▪ Powdery scab ▪ Sclerotium stem rot ▪ Weeds 		
	Order seed potatoes of desired cultivar and certification level.		
	Check seed tubers for tuberborne diseases. <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ▪ Black dot ▪ Common scab ▪ Powdery scab </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ▪ Late blight ▪ Rhizoctonia (black scurf) ▪ Silver scurf </td> </tr> </table>	<ul style="list-style-type: none"> ▪ Black dot ▪ Common scab ▪ Powdery scab 	<ul style="list-style-type: none"> ▪ Late blight ▪ Rhizoctonia (black scurf) ▪ Silver scurf
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✓ Done	Previous crop and preplanting (continued)
	Follow proper handling procedures for seed tubers.
	Consider seed treatments to reduce disease problems. <ul style="list-style-type: none"> ▪ Fusarium seed piece decay ▪ Rhizoctonia stem and stolon canker ▪ Silver scurf

✓ Done	Planting activities Special issues of concern related to water quality: Insecticide application, fertilizer application, and runoff.
	Plant under appropriate soil temperature and soil moisture conditions to avoid. <ul style="list-style-type: none"> ▪ Seed piece decay ▪ Bacterial soft rot and blackleg
	Based on field history, consider a soil-applied insecticide to control. <ul style="list-style-type: none"> ▪ Aphids ▪ Wireworms ▪ Psyllids ▪ Flea beetles
	Fertilize according to soil analysis results.
	Consider applying fungicide in furrows at planting to reduce: <ul style="list-style-type: none"> ▪ Fusarium seed piece decay ▪ Rhizoctonia stem and stolon canker ▪ Silver scurf

✓ Done	Preemergence Special issues of concern related to water quality: Herbicide application and runoff.
	Apply** preemergent herbicide if needed, according to PMG.
	Manage soil moisture to minimize: <ul style="list-style-type: none"> ▪ Fusarium seed piece decay ▪ Bacterial soft rot and blackleg



✓ Done	Emergence through row closure Special issues of concern related to water quality: Fertilizer application, insecticide application, fungicide application, drift, and runoff.
	Monitor aphids weekly (Klamath Basin only). Keep records (example form available online) and treat** if needed according to PMG.
	<p>Watch for pests of foliage, including:</p> <ul style="list-style-type: none"> ▪ Aphids ▪ Tubeworm ▪ Whiteflies ▪ Psyllids ▪ Loopers/worms ▪ Flea beetles ▪ Late blight ▪ Early blight ▪ Blackleg ▪ White mold <p>Note presence of pests or damage (example form available online). Manage according to PMGs.</p>
	<p>Monitor for tubeworm adults (Central and Southern California).</p> <ul style="list-style-type: none"> ▪ Put out pheromone traps. ▪ Keep records (example form available online). <p>Treat** if needed according to PMG.</p>
	Use hilling to shape beds that facilitate tuber coverage during tuber bulking.
	Survey for weed emergence. Cultivate or apply** postemergent herbicide as needed.
	If white mold has been a problem in previous potato crops, treat** at flowering according to PMG.
	Consider fungicide application** if there is a field history of pink rot or leak.
	Irrigate as needed.
	Apply fertilizer as needed. Avoid over- or under-fertilization, especially nitrogen.

✓ Done	Row closure to maturity Special issues of concern related to environmental quality: Fertilizer application, insecticide application, fungicide application, drift, and runoff.
	Monitor aphids weekly (Klamath Basin only). Keep records (example form available online) and treat** if needed according to PMG.
	<p>Watch for pests of foliage, including:</p> <ul style="list-style-type: none"> ▪ Aphids ▪ Tubeworm ▪ Whiteflies ▪ Psyllids ▪ Loopers/worms ▪ Flea beetles ▪ Late blight ▪ Early blight <p>Note presence of pests or damage (example form available online). Manage according to PMGs.</p>
	<p>Monitor for tubeworm adults. (Central and Southern California)</p> <ul style="list-style-type: none"> ▪ Continue monitoring pheromone traps. ▪ Keep records (example form available online). <p>Treat** if needed according to PMG.</p>



✓ Done	Row closure to maturity (continued)
	Based on field history, manage diseases according to PMGs. <ul style="list-style-type: none"> ▪ Pink rot ▪ Leak (Central and Southern California)
	If white mold has been a problem in previous potato crops, treat** at flowering according to PMG.
	Manage soil moisture to avoid soil cracking, but avoid over-irrigation to prevent diseases.
	Apply fertilizer as needed. Avoid over- or under-fertilization (especially nitrogen).

✓ Done	Maturation and harvest
	Special issues of concern related to environmental quality: Fungicide application, application of vine-killing agents, drift, and runoff.
	Where tuberworm can be a problem, use hilling as needed to keep tubers covered.
	Monitor for late blight and early blight. Treat** with fungicide or vine-killing agent as needed, according to PMGs, to control them before harvest and prevent tuber infections.
	Look for Sclerotium stem rot and consider early harvest if present.
	Irrigate as needed. Manage water for late-season weed control and to avoid disease.
	Apply** contact herbicide as needed for complete vinekill and control of nutsedge.
	Allow tubers to mature after vine kill and before harvest.
	Harvest at proper soil moisture and temperature.
	Use careful, harvesting and handling procedures to reduce bruising.
	After harvest, observe crop for tuber rots, nematodes, and insect damage. Use these observations to decide how stored tubers will be handled and to assess the effectiveness of the season's pest management program before planning the next season's program.

✓ Done	Storage												
	Use proper sanitation in storage areas (Klamath Basin only).												
	Use proper curing conditions at beginning of storage.												
	Maintain proper ventilation, humidity, and temperature.												
	Monitor stored tubers for pest problems: <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">▪ Late blight</td> <td style="width: 33%;">▪ Fusarium dry rot</td> <td style="width: 33%;">▪ Tuberworm</td> </tr> <tr> <td>▪ Silver scurf</td> <td>▪ Pink rot</td> <td>▪ Root knot nematodes</td> </tr> <tr> <td>▪ Black dot</td> <td>▪ Leak</td> <td>▪ Leafroll net necrosis</td> </tr> <tr> <td>▪ Bacterial soft rot</td> <td>▪ Early blight</td> <td></td> </tr> </table>	▪ Late blight	▪ Fusarium dry rot	▪ Tuberworm	▪ Silver scurf	▪ Pink rot	▪ Root knot nematodes	▪ Black dot	▪ Leak	▪ Leafroll net necrosis	▪ Bacterial soft rot	▪ Early blight	
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▪ Bacterial soft rot	▪ Early blight												
	Avoid repeated pile disturbance.												
	Store at temperatures that prevent nematode multiplication if compatible with intended use.												



✓ 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.

