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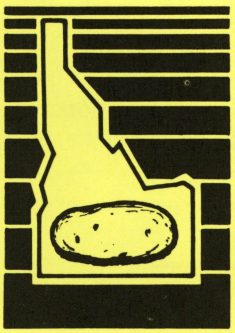
POTATO INSECT CONTROL



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Preventive insect control is essential in production of high quality potatoes. Preplanning and proper timing of insecticide applications in harmony with seasonal cultural practices are important.

Potato seed does not harbor insect pests. However, certain seasons favor unusual activity of one or more species of insects that will attack seed potatoes, roots and in some cases the developing tubers.

Only well suberized seed should be planted. Attack by seed-corn maggot can be prevented by planting potatoes when the ground is warm and rapid plant growth is assured. Planting at this time will also reduce millipede injury. In areas where leather jackets are found their attack can be prevented by incorporating a green manure crop into the soil in the fall rather than in the spring. Attack by the gray garden slug on potato seed or tubers may occur when the soil is unusually wet.

Wireworm control is important since most untreated Idaho soils are wireworm infested. Dyfonate, chlordane and phorate have given best control of wireworms in Idaho tests.

Organophosphorus insecticides have short residues. They must be immediately incorporated into the soil following application and are effective only when the soil temperature is above 50 degrees F at 6-inch depth. At this time, most wireworms will be above this level. For best results, soil should contain between 50 and 70 percent of its water-holding capacity and be above 50 degrees F.

White grubs infest soils having an abundance of humus. Early fall plowing generally eliminates the need for soil insecticide treatment. Only chlordane is registered for control of white grubs. Since humus will inactivate some of the insecticide, the maximum rate per acre having federal clearance must be used. Soil treatment procedures for wireworm control must be closely followed for satisfactory grub control. These procedures also give satisfactory leather jacket control.

Garden symphylan numbers may be reduced by mixing parathion or dyfonate into the soil in the spring as suggested for wireworm control. Symphylan infestation can scar the surface of tubers. High quality potatoes are seldom produced in infested soils.

Colorado potato beetle eggs are laid in groups on the underleaf surfaces. They hatch into black-headed, red-bodied larvae in about 7 days. Control treatments should be applied after most of the eggs have hatched but before serious plant damage occurs. Treat infestations with endosulfan (Thiodan), carbaryl (Sevin), azinphosmethyl (Guthion), Monitor or Imidan. Thorough coverage is important.

The green peach aphid and occasionally the potato aphid reach damaging populations in Idaho. Potato vines may wilt from loss of sap if populations become extremely high. The most important losses result from transmission of potato leaf roll virus by the green peach aphid. The disease may reduce the quality of commercial potatoes by producing tuber net necrosis and may result in rejection of seed lots for certification.

The sources of most green peach aphid infestations are either peach trees (where the winter is passed in the egg stage) or infested vegetable and flower plants purchased from greenhouses for transplanting in home gardens. In the spring the winged aphids fly from home gardens into potato fields where they feed and multiply. Should the aphids happen to feed upon a leaf roll virus-diseased potato plant, they will acquire and later transmit the virus as they move from plant to plant. To kill aphids in the spring, thoroughly spray peach trees and all infested garden transplants before they are planted.

POTATO INSECT CONTROL SCHEDULE

Insect	Insecticide	Minimum days from application to harvest	Maximum per acre actual material	Application methods and remarks
			Soil Inhabiting Insects	
Wireworms	dyfonate*	none	4 lb	Soil temperature must be 50° F or above at 6" depth. Soil moisture content must be about 50-70% of the water holding capacity of soil.
	parathion*	none	6 lb	
	diazinon	none	6 lb	***To be applied only by commercial applicators. Keep persons and animals off treated area for 48 hours.**
	chlordane	none	10 lb	Allow a minimum of 3 crop seasons before rotating chlordane-treated soil to sugar beets. Some processors will not accept potatoes grown in chlordane-treated soil. Check with your processor before treament.
	phorate* (Thimet)	90	3 lb	Distribute phorate granules evenly in furrow or granules may be banded on each side of row at planting time.
	D-D	none	300 lb (30 gal)	Plow in or inject into fallow soil at 12" intervals and 8" deep at least 3 weeks prior to planting potatoes. Soil temperatures should be between 50-90° F. at a 6" depth. Do not treat when soil is very wet or very dry. Poor wireworm control may be expected when soil temperatures are below 50 degrees. Do not plant onions for 2 years after ethylene dibromide treatment.
	ethylene dibromide	none	36 lb (3 gal 83%)	
	Telone	none	200 lb (20 gal)	
White grubs	chlordane	none	10 lb	Allow a minimum of 3 crop seasons before rotating chlordane-treated soil to sugar beets. Some processors will not accept potatoes grown in chlordane-treated soil. Check with your processor before treament.
Garden symphylan	parathion*	none	5 lb	Apply in Spring or August. See above moisture and temperature requirements. Turn soil 3 times.
	dyfonate*		2 lb	***To be applied only by commercial applicators.**
	D-D	none	250-300 lb (25-30 gal)	See section above on wireworms for treatment procedures.
	Telone	none	200-250 lb (20-25 gal)	
			Foliar Insects	
			When selecting insecticides PREVENT ILLEGAL RESIDUES by considering crops in rotation and drift onto adjacent crops.	
Two-spotted spider mite	sulfur	none	25 lb	On foliage as needed. Mites are seldom a problem. Generally infestations first occur on potato plants in the field margins that are adjacent to dusty roads and other infested crops.
	Omite	14	2-1/4 lb	
Loopers	methamidophos (Monitor)	14	1 lb	Apply when foliar damage justifies treatment.
Cutworms	carbaryl (Sevin)	none	2 lb	Monitor is not labeled for cutworms. Carbaryl is not labeled for loopers and must be used at 2 lb per acre for cutworm control.

Insect	Insecticide	Minimum days from application to harvest	Maximum per care actual material	Application methods and remarks
Colorado potato beetle	azinphosmethyl* (Guthion)	7	6 oz	On foliage shortly after eggs hatch, repeat within 10-14 days where needed.
	Imidan	7	1 lb	
	carbaryl* (Sevin)	none	1 lb	
	endosulfan (Thiodan)	none	1 lb	
	methamidophos* (Monitor)	14	3/4 lb	***Hazardous to all parasites & pollinators. Avoid use where bees are close by.**
	disulfoton G (Di-Syston)	75	3 lb	Soil treatment, see aphids. A foliar treatment may be needed for late season beetle infestation.
	aldicarb (Temik)	90	2 lb	Soil treatment at planting (see aphid section).
	phorate (Thimet)	90	3 lb	
Green peach aphid Potato aphid	disul[illegible]on (Di-Syst[illegible])	75	3 lb	Apply Di-Syston in seed furrow or in band on each side of seed furrow at planting. An additional application may also be made as a side dressing after plants become established. Soil application of disulfoton will usually give 6-8 weeks control of green peach aphid.
	phorate (Thimet)	90	3 lb	Distribute phorate granules evenly in furrow or granules may be banded on each side of the row at planting time. Soil application of phorate will usually give 4-6 weeks control of green peach aphid.
	aldicarb (Temik)	90	3 lb	Apply granules with seed pieces in planting furrow and cover with soil OR drill granules in even bands 2-4 inches on each side of row and 3-8 inches deep (usually 1-2 inches below seed piece). Soil application of aldicarb will usually give 8-10 weeks control of green peach aphid. Systemics such as aldicarb, phorate and disulfoton are effective only when soil moisture is adequate for vigorous plant growth.
	endosulfan (Thiodan)	none	1 lb	Foliar sprays. Good plant coverage including the bottom leaves is essential for adequate control. Endosulfan is more effective when daytime temperatures are above 70°F. Oxydemetonmethyl is more effective when plants are actively growing and before lower leaves have turned yellow.
	oxydemetonmethyl (Meta-Systox-R)	7	1/2 lb	
	methamidophos (Monitor)	14	1 lb	

When selecting insecticides PREVENT ILLEGAL RESIDUES by considering crops in rotation and drift onto adjacent crops.

These recommendations for use are based on the information currently available for each chemical listed. If followed carefully, residues should not exceed the tolerance established for any particular chemical. To avoid excessive residues follow label recommendations carefully with respect to dosage levels, number of applications, and minimum interval between applications and harvest. **The Grower is responsible for residues on his crops as well as problems caused by drift from his property to other properties or crops.**

Brand names have been used for convenience only. No preference is intended.

Keep RECORDS of all PESTICIDE APPLICATIONS

Trap pan surveys to monitor the green peach aphid are conducted in several areas of southern Idaho. Counts from trap pans serve only as a guide to the relative abundance and activity of the aphid. Control decisions for a particular field should be based upon leaf counts made in that field.

Systemic insecticide treatments with disulfoton (Di-Syston), phorate (Thimet) or Temik (aldicarb) will kill the aphids as they feed, but not before some plants have become infected with leafroll. Thus the treatment reduces but does not eliminate spread of the virus within the field. Systemic treatments will also reduce early season feeding damage of the intermountain potato leafhopper, thrips, and Colorado potato beetle larvae. Late season insect flights into the potato fields may require additional insecticide treatments.

Two-spotted spider mites attack lower leaf surfaces. When the entire plant becomes infested, the leaves become yellow, wilt and drop to the ground. Generally spider mite infestations are first noticed on infested crop fields. Treating a 30-foot border of fields next to potatoes with dusting sulfur generally prevents potato fields from becoming infested. Dusting sulfur is very effective and will not leave an undesirable residue on the crop. Often after an adjoining hay or grain field has been harvested an insecticide treatment may be needed. Two applications at an interval of 7 to 10 days will be necessary. The second treatment will kill the spider mites which were eggs at the time of the first treatment. Where thrips have migrated from harvested grain a 15-foot area into the potato field should be treated.

Occasionally leaf feeding insects such as **alfalfa looper, blister beetles, cutworms, false chinch bug, flea beetles, intermountain potato leafhopper, lygus bugs** and **tomato hornworms** attack potato plants. When large areas are involved, control treatments will be needed. Generally the damage is minor and controls are not warranted.

SAFETY CONSIDERATIONS FOR PESTICIDE USE

All pesticides are poisonous to warm-blooded animals to some degree. They should be handled cautiously to prevent poisoning pets, livestock, wildlife, and humans. When using any chemical, observe the following safe use procedures:

1. Always read the label before using any chemical, and carefully follow the directions given. Each time before opening the container note warnings and cautions.
2. Keep insecticides out of the reach of children and pets. Pesticides should be kept in their original containers, outside the home, in a locked storage.
3. Do not spill concentrates or sprays on the skin or clothing. If they are spilled, remove the contaminated clothing immediately and wash body and clothes thoroughly.
4. Never smoke while spraying.
5. Avoid inhaling insecticide mists and vapors; and when directed on the label, wear protective clothing and a face mask. A handkerchief fitted to the face, coveralls and gloves will help prevent excessive inhalation and contact with the insecticide.
6. Wash hands and face and change to clean clothing immediately after spraying. Always wash clothing before re-use.
7. Cover food and water containers when treating around livestock or pet areas. Do not contaminate fish ponds.
8. Use separate equipment for applying hormone-type herbicides in order to avoid accidental injury to susceptible plants from contaminated spray equipment.
9. Always dispose of empty containers in trash or by burning or burying so that they pose no hazard to humans, animals, or plants. When burning containers, avoid inhaling smoke.
10. Observe label directions and cautions to avoid undesirable residues.

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