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# **Insect and Weed Control in Small Grains**

**VIRGINIA COOPERATIVE EXTENSION SERVICE  
EXTENSION DIVISION  
VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY**

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1. Read the label on each pesticide container before each use. Follow instructions to the letter; heed all cautions and warnings, and note precautions about residues.
2. Keep pesticides in the containers in which you bought them. Put them where children or animals cannot get to them, preferably under lock and away from food, feed, seed, or other material that may become harmful if contaminated.
3. Dispose of empty containers in the manner specified on the label.

SEE YOUR DOCTOR IF SYMPTOMS OF ILLNESS OCCUR DURING OR AFTER USE OF PESTICIDES.

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## SMALL GRAIN INSECT CONTROL

R. M. McPherson and J. E. Roberts, Sr.\*

### Aphids

Four species of aphids attack small grain in Virginia--green bugs, English grain aphids, corn leaf aphids, and oat bird-cherry aphids. These aphids give birth to living young and all offspring are females. Both winged and wingless forms occur in small grains and newly-born aphids begin reproduction in about 7 days when temperatures exceed 75 F. One female can produce about 80 offspring thus enormous populations can occur in a short time. Aphids suck plant juices with their piercing mouthparts and toxins are injected into the plant during feeding. Heavily infested small grains turn yellowish to orange color. Initially, infestations occur in localized spots in the field. As infestations increase, plants die and the aphids move to uninfested plants, enlarging the affected area. All four species can transmit Barley Yellow-dwarf Virus. Insecticide need depends on the number of aphids present, size and vigor of plants, weather conditions, plant developmental stage, and abundance of parasites and predators. The following table serves as a guide in determining the need for treatment in small grains:

<u>Plant height (inches)</u>	<u>Aphids/linear foot</u>
3-6	100
4-8	200
6-16	300

The appearance of small yellow or brown areas caused by aphid feeding indicates a need for treatment. Occasionally, populations of 25 to 50 aphids per linear foot of row on young grain plants may warrant treatment. Sample fields routinely by observing the number of aphids per foot of row in several locations in the field.


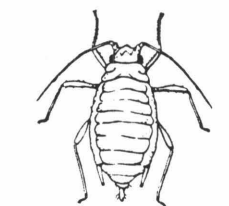
### ARMYWORMS

Armyworms can cause heavy losses to small grains, particularly when plant growth is thick. Larvae defoliate the plants and also can clip the stems just below the heads. Full grown larvae are about one inch and greenish to brownish in color with several dark stripes, one along each side and one down the back. In early spring the moths emerge and females begin laying eggs in mid-April. Eggs are laid in large clusters. Heavy larval populations can occur from mid-May to harvest. Populations of 3 to 5 larvae per square foot justify treatment. Sample fields regularly beginning in early May and continuing until the grain has matured. Count all larvae on the foliage plus the larvae curled up at the base of the stems. Observe several square foot areas within the field.

### Cereal Leaf Beetles

Both adults and larvae of the cereal leaf beetle damage small grain. They feed on leaves, chewing out long strips between the veins. Heavy feeding gives plants a yellowish-white, frosted appearance. Adult beetles are about 3/16 inch long and are a metallic bluish-black color with red legs and thorax. Full grown larvae are slightly larger than adults, and are a yellowish color but are usually covered with brownish colored fecal matter. Population levels of one larvae per terminal leaf can reduce yields 2-4 bushels per acre. Determine the average number of adults and larvae per terminal leaf in several locations within the field.

\*Extension Specialist, Pest Management, Entomology; and Extension Specialist, Entomology; respectively.

Pest	Insecticide and Formulation	Rate Per Acre and Remarks and Precautions	Days Between Last Application and Harvest
SMALL GRAINS (BARLEY, OATS, WHEAT AND RYE)			
Aphids (not on rye)	Demeton (Systox) 2 (25% EC) OR Systox 6 (66% EC) 1/	Apply 1/2 to 1 pt. per acre of Systox 2 OR 1/6 to 1/3 pt. per acre of Systox 6. Foliar applications only. Do not apply more than twice per season. Do not repeat application within 14 days.	45 days grain. Do not graze treated fields or harvest for forage.
(Wheat only)	Dimethoate (Cygon) Cygon 400	Apply 1/2 - 3/4 pint of Cygon 400	60 days harvest. Do not apply within 14 days of grazing immature plants.
	Microencapsulated Methyl Parathion (Pennacp M) 2 lb./gal	Apply 1 to 1 1/2 pts. Use only when aphids are present in damaging numbers. Use at least 2 gallons of water per acre when applied by air.	15 days harvest or grazing.
	Disulfoton (Di-Syston) 85% LC 1/ 2/	Apply 4 to 12 ozs. per acre. <u>For application by aircraft or ground equipment:</u> Apply specified dosage per acre in sufficient water to obtain thorough coverage but not less than 2 gallons total volume per acre. Use the lower rates on plants up to tillering (stooling). Higher rates should be used after plants begin to tiller. <u>FOR APPLICATION IN LIQUID FERTILIZER:</u> Mix 4 to 12 ozs. of Di-Syston Liquid Concentrate in the amount of liquid fertilizer to be applied per acre. Apply this mixture as a top dressing with suitable ground equipment. Application at green-up may be made following "fall applications." A second application may be made 30 days following the spring application.	60 days Do not graze or cut for forage within 30 days of harvest.
	Disulfoton (Di-Syston) 85% LC 1/ 2/	Apply 1 pint of the liquid concentrate in water to cover but not less than 2 gal. total volume per acre. May be applied in liquid fertilizer. Apply as soil injection in water emulsion or with liquid fertilizer at planting time.	60 days grains 30 days precutting or pregrazing.

1/ These insecticides are extremely poisonous. Use extreme precautions in handling and applying. Call a physician immediately if you become ill while using these pesticides.

2/ Should be applied at temperatures approaching 70 F to be most effective.

Pest	Insecticide and Formulation	Rate Per Acre and Remarks and Precautions	Days Between Last Application and Harvest
Aphids (continued) (not on rye)	Disulfoton (Di-Syston) 15% G 1/	Apply 6.7 lb. per acre. Apply by drilling or broadcast at planting time or as a broadcast after emergence. <u>Wheat - Apply at planting time only.</u> Maximum of two applications in barley and oats. Allow a minimum of 21 days between applications for barley and oats.	30 days precutting or pregrazing (barley, oats, wheat) 60 days grain (barley, oats).
	Malathion (Cythion) 57% EC 2/	Apply 1 1/2 pt. per acre in water to cover.	7 days grain
	Parathion 4 lb./gal. OR 8 lb./gal. 1/	Apply 1/2 pt. of 4 lb./gal. EC OR 1/4 pt. 8 lb./gal. EC. Workers entering fields within 48 hours should wear protective clothing.	15 days small grain. Not registered for rye.
Armyworms	Malathion 57% EC Three to five armyworms per square ft. more than 1/2 long indicates a need for treatment.	Apply 1/2 - 2 pt. (corn), 2 pt. (small grain). This is a safe chemical for aerial applicators to use near residential areas.	5 days corn - harvest 7 days all others - grain or forage.
	Methomyl (Lannate or Lannate L)	Apply 1/4 to 1/2 lb. Lannate OR 1-2 pts. Lannate L per acre.	Do not graze or feed to livestock within 10 days of last application. Do not harvest within 7 days.
	Methyl Parathion 4 lb./gal. and Ethyl Parathion 4 lb./gal. OR Ethyl Parathion 8 lb./gal. 1/ (NOT REGISTERED FOR RYE.)	Apply 1 pint per acre Apply 1/2 to 3/8 pt. of 8 lb./gal.	15 days for barley, oats, wheat and rye.
Armyworms, variegated cutworm	Trichlorfon (Dylox) 80% SP	Apply 10-20 oz. Do not use on rye. Three to five armyworms and/or cutworms per square ft. more than 1/2 inch long indicates a need for treatment.	21 days small grain. Limit to 3 applications per season. Applications can be made without removing livestock.
Grasshoppers	Malathion (Cythion) 57% EC	Apply 1 1/2 pt. per acre in water to cover.	7 days small grain.
	Microencapsulated Methyl parathion (PennCap M) 2 lb./gal.	2 pts. per acre	15 days
Cereal leaf beetle	Azinphosmethyl (Guthion) 22% EC	Apply 1 1/2 - 2 pt. Apply specified dosage per acre by air or ground equipment in sufficient water for complete coverage but not less than 2 gal. per acre.	30 days food, feed, forage or grazing. Do not apply more than once per season.
(not on rye)	Malathion (Cythion) 57% EC	Apply 1 - 1 1/2 pt. of 57% Malathion EC. Apply specified dosage per acre by air or ground equipment in sufficient water for complete coverage.	7 days (barley wheat, oats)

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2/ Should be applied at temperatures approaching 70 F to be most effective.

WEED CONTROL IN SMALL GRAINS

C. L. Foy and H. P. Wilson\*

Barley, Oats, Rye, Wheat

Weed Problem	Chemical Rate/A	Product/A	Remarks
Corn chamomile, corn growwill, cow cockle, henbit, knawel (German moss), mayweed, pennycress, pepperweed, shepherdspurse, wild mustard, wild radish, bachelor's button (Ragged Robin), yellow rocket	bromoxynil 0.375-0.5 lb	Brominal 1.5-2.0 pt  OR Buctril 1.5-2.0 pt	Destroy all weed seedlings before seeding small grains. Look for weeds as soon as small grains start to germinate. Apply after small grain is beyond 2-leaf stage and weed seedlings have no more than 3-4 leaves or rosettes 1 1/2 inches across. Use higher rate for cow cockle, henbit and wild mustard control. Poor control has resulted when applied to larger weeds. Thorough weed coverage is necessary for effective control. Do not apply if small grains form a canopy, during or after boot stage, or when crop is under stress for lack of moisture. Late winter or early spring applications have been relatively ineffective. Do not contaminate streams, lakes and ponds with this material. Do not graze treated fields for 30 days after application.
Black mustard, blessed thistle, bulbous buttercup, burdock, cornflower (Ragged Robin), corn poppy, curly dock seedlings, fanweed, goatsbeard, hairy vetch, pennycress, plantain, primrose, prickly lettuce, rock cress, shepherdspurse, wild mustard, wild radish, wild turnip, fleabane, calicory	2,4-D amine 0.5 lb	1.0 pt of a 4.0 lb/gal formulation	Apply spray in early spring when small grain is 4-7 inches tall. Make sure grain is fully tillered (stooled) and has not begun to joint. <u>Oats may be injured.</u> Do not spray from boot to dough stage. Do not forage or graze treated fields within 2 weeks after treatment.
	MCPA 0.25-0.5 lb	0.5-1.0 pt of a 4.0 lb/gal formulation	Apply in spring after small grains have fully tillered (stooled) and before early boot stage. Do not apply when grain is in the boot to dough stage. Legumes may be injured if not protected by weed canopy. Use lower rate on small grains underseeded to legumes. See remarks above for 2,4-D.

\*Extension Specialist, Plant Physiology; and Plant Physiologist, Virginia Truck and Ornamentals Research Station; respectively.

Weeds in Agronomic Crops (Cont'd)  
Small Grains

Postemergence (Cont'd)

Weed Problem	Chemical Rate/A	Product/A	Remarks
Above weeds, garlic and wild onion	2,4-D ester 0.75 lb	1.5 pt of a 4.0 lb/gal formulation	Spray when grain is tillered but before jointing stage. Overdosage may result in damage to crop. Onion or garlic is prevented from forming aerial bulblets. Oats are susceptible to injury at rate necessary to control garlic. See remarks above for 2,4-D.
Harvest aid; above weeds listed for 2,4-D	2,4-D amine 1.0-1.5 lb	2.0-3.0 pt of a 4.0 lb/gal formulation	Apply after hard dough stage to harvest as an aid to harvesting on barley, oats, and wheat. Do not feed treated straw to livestock.
Corn chamomile, cow cockle, corn cockle, dandelion, dog fennel (mayweed), goatsbeard, knawel (German moss), smartweed	dicamba 2.0 oz	Banvel 0.25 pt	Make application immediately after winter dormancy and before small grains start to joint. Do not graze or feed treated forage to dairy cattle prior to crop maturity. This is not registered for rye.
Above weeds listed for dicamba and 2,4-D	dicamba 2.0 oz + 2,4-D 4.0-6.0 oz OR MCPA 4.0-6.0 oz	Banvel 0.25 pt + 2,4-D 0.5-0.75 pt OR MCPA 0.5-0.75 pt of a 4.0 lb/gal formulation OR Banvel K 0.8 pt on wheat only	See 2,4-D and dicamba above.
Preplant for johnsongrass control	glyphosate 2.0-3.0 lb	Roundup 2.0-3.0 qt	Apply in 20-60 gal water per acre when johnsongrass is 18 inches or more in height and approaching the early head stage of growth. Allow 7 or more days before plowing. Barley, oats and wheat can be planted immediately after tillage. Do not feed or forage treated crops within 8 weeks after treatment.

