INSECTICIDE RECOMMENDATIONS FOR ALFALFA, CLOVER, AND PASTURES – 2022

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This publication contains only a portion of the information included on pesticide labels. Always read the product label carefully before buying and using any pesticide. Many insecticides are sold under brand names that are not listed in this publication. No endorsement is intended for products mentioned, nor is criticism meant for products not listed.

Products are arranged by IRAC mode of action groups and listed by common name with some example brand names. Products listed in **bold** are **Restricted Use** insecticides. Products listed in *italics* are approved for organic production.

Insecticides have been placed into numbered Insecticide Mode of Action groups (MOA) based on how they work against insects. Continual use of products from a single group against a pest species can lead to reduced control (resistance) by all products in the group. To minimize control failures due to insecticide resistance, do not apply insecticides within the same group repeatedly. Rotate among groups during the growing season.

Alfalfa weevil control

The best alfalfa weevil management decisions are based on stem sampling. If this information is not available, then control is recommended when 25% to 50% of the tips are being fed upon and 2 or more larvae can be found per stem. * See additional threshold table at the end of this publication.

Alfalfa Weevil Insecticides	MOA Group	Harvest or Graze – days Interval/ REI*
carbaryl - Sevin XLR, Sevin 4F, etc.	1A	May temporarily bleach tender foliage. 7 / (12 hrs)
methomyl - **Lannate SP**	1A	7 / (48 hrs)
malathion - Malathion	!B	0 / (12 hrs)
phosmet - Imidan 70 W	1B	7 / (5 days)
b-Cyfluthrin - **Baythroid XL**	3A	7 / (12 hrs)
g-Cyhalothrin - **Bolton, Declare, Proaxis 0.5 EC**	3A	Apply only to planted pure stands. 1 day forage, 7 day harvest (24 hrs)
l-Cyhalothrin - **Warrior II**	3A	1 d - forage, 7d – hay / (24 hrs)
z-Cypermethrin - **Mustang Maxx**	3A	3 / (12 hrs)
a-Cypermethrin – **Fastac EC**	3A	3/(12 hrs)
permethrin - **Ambush, Pounce 25 WP,** etc.	3A	Do not apply to intentionally mixed stands of forage grasses or legumes (>4 fl oz/ a - 14 d) / (12 hrs)
pyrethrins - PyGanic	3A	0 / (12 hrs)
idoxacarb - Steward 1.25 SC	22	7 / (12 hrs)
l-Cyhalothrin + chlorantraniliprole - **Besiege**	3A+28	1-forage, 7-hay / (24 hrs)

* Restricted Entry Interval (hours)

Evaluating post-harvest alfalfa weevil larval and adult damage

Routine stubble sprays are not justified. If early harvest was used as a weevil management tool, there occasionally may be sufficient larvae or newly-emerged adults present to justify an insecticide application. Watch such fields carefully for the normal

green-up that indicates active re-growth. Surviving larvae may feed on developing leaves and new adults can cause "notch-like" feeding holes on leaves giving them a feathery appearance. Use the table below to evaluate larval numbers and plant height to determine if control is needed. Treatment may be justified if adult weevil are feeding on 50% or more of the crowns or re-growth is prevented for 3 to 6 days. Use low rates if an insecticide application is necessary.

Assessing alfalfa weevil larvae on first cutting re-growth (5 to 7 days after harvest)

# larvae/30 stems*	20	33	47	60
# larvae/30 stems **	17-20	17-32	23-46	23-59
Plant height	2"	4"	6"	8" or taller

*Spray with a short residual insecticide if the number of larvae/30 stems exceeds the number in the table above for the appropriate alfalfa height.
**Sample again in 2 days if the number of larvae/30 stems is in this range for the appropriate alfalfa height. If numbers are below this level, no treatment should be necessary.

Potato leafhoppers

When to sample: Sample each field once a week. Established alfalfa fields should be first sampled the week following the end of alfalfa weevil season. Sample new seedings beginning in mid-May. Damaging leafhopper populations may build up in spring seedings if alfalfa is not cut until late June or early July. Sample fields anytime during the day when the foliage is not wet. Sweeping alfalfa when it is wet from dew or rain is difficult and the samples are almost impossible to count. **Equipment needed:** * Yardstick or other measuring device. * 15" sweep net. * Pencil and paper. * Potato Leafhopper Treatment Guideline Table.

How to sample: 1. Take 20 sweeps at 5 locations in the field (100 sweeps per field). 2. Count all potato leafhoppers (adults and nymphs) collected at each location and record these numbers. 3. Randomly collect 10 complete stems as you leave the field. Compute the average stem height, and count the number of stems with buds or flowers. 4. Compute the number of leafhoppers per sweep and use the "Potato Leafhopper Economic Threshold Table" to determine if control measures are needed.

Determining the need for leafhopper control: Sample the field within 7 days after cutting to determine whether or not control measures are needed. After the first cutting, and for every additional cutting, use the Treatment Guideline Table below to determine when potato leafhoppers should be controlled. If your leafhopper counts exceed the critical values on the table, control measures should be implemented. Early harvests often can control potato leafhoppers. However, insecticides may be needed especially if the alfalfa is small, usually early in the regrowth period.

Potato leafhopper treatment guidelines

Average stem length	# Leafhoppers/Sweep	# Leafhoppers/100 Sweeps
Less than 3"	0.2	20
3" to 6"	0.5	50
8" to 10"	1.0	100
12" to 14"	2.0	200

If the alfalfa is at 30% bud or more you should plan on cutting within 7-10 days. In this case there is no need to spray. However, soon after cutting you should resample the field to determine the need for control. Harvesting will kill a high percentage of potato leafhopper nymphs and some adults. Most surviving adults will leave the field so stubble sprays are unnecessary. The adults will return when the regrowth is about 4" to 6" tall. Sweep samples, beginning 5 to 7 days after harvest, will determine if a treatment is necessary.

Potato Leafhopper Insecticides	MOA Group	Harvest or Graze – days Interval/ REI*
carbaryl - Sevin XLR, Sevin 4F, etc.	1A	May temporarily bleach tender foliage. 7 / (12 hrs)
dimethoate - Dimethoate 400, Dimethoate 2.67, Dimate 4 EC,	1B	10 / (2 days)
malathion - Malathion	!B	0 / (12 hrs)
phosmet - Imidan 70 W	1B	7 / (5 days)
b-Cyfluthrin - **Baythroid XL**	3A	7 / (12 hrs)
g-Cyhalothrin - **Bolton, Declare, Proaxis EC**	3A	Apply only to planted pure stands. 1 day forage, 7 day harvest (24 hrs)
l-Cyhalothrin **- Warrior II**	3A	1 d - forage, 7d – hay / (24 hrs)
a-Cypermethrin – **Fastac EC**	3A	3/(12 hrs)
z-Cypermethrin - **Mustang Maxx**	3A	3 / (12 hrs)
permethrin - **Ambush, Pounce 25 WP, etc.**	3A	Do not apply to intentionally mixed stands of forage grasses or legumes (more than 4 fl oz/ a - 14 d) / (12 hrs)
pyrethrins - PyGanic	3A	0 / (12 hrs)
flupyradifurone – Sivanto Prime 1.67	4D	7/(4 hrs)
idoxacarb - Steward 1.25 SC	22	7 / (12 hrs)
azadirachtin (26) - Aza-Direct, etc.	26	0 days (4 hrs)
l-Cyhalothrin + Chlorantraniliprole -**Besiege**	3A+28	1-forage, 7-hay / (24 hrs)

Other alfalfa and clover pests

Aphids- An average of 50 or more green pea aphids per stem would be needed to justify control. Treat only if plants lose their dark green color and are wilting. Products such as *Aza-Direct*, **Baythroid XL**, **Besiege**, Cythion, Dimethoate, **Fastac,** Imidan**,** **Lannate**, Malathion, *M-Pede*, **Mustang Maxx**, **Pounce, Proaxis,** Sivanto Prime or **Warrior II** may be used.

Blister Beetles are long cylindrical beetles that may be black, gray, yellow and brown striped or black with gray margins on the wing covers. These insects usually appear in mid-July and are usually found feeding in clusters on plant flowers. Livestock that eat hay containing dead beetles can become sick and may die. If small numbers are found, they can be kept out of the harvested hay by avoiding the use of a hay "crimper" when cutting the crop. If the beetles are not crushed during the harvesting process, they will leave the field before the hay is baled. Blister beetles can be controlled using applications of carbaryl sprays sold in products such as *Aza-Direct*, **Besiege**, **Proaxis,** Sevin 4F, 80S, Sevin XLR, or **Warrior II**. See the label for the rate to use. Do not apply Sevin or **Warrior II** within 7 days of harvest.

Cloverleaf weevil larvae are usually controlled by a fungus each spring and insecticide treatments are seldom justified. Fungus infected larvae are yellow-brown and often are found stuck to leaves at the top of the plant. Healthy cloverleaf weevil larvae are always found on the ground at the base of the plant during the daylight hours.

Grasshoppers

Treat after cutting when plants are less than six inches tall if more than 15 grasshoppers per square yard are found in the field. Treat if there are 40 or more grasshopper nymphs or adults per square yard in the field margins or field.

Grasshopper Insecticides	MOA Group	Harvest or Graze – days Interval / REI*
carbaryl - Sevin XLR, Sevin 4F, etc.	1A	May temporarily bleach tender foliage. 7 / (12 hrs)
dimethoate - Dimethoate 400, Dimethoate 2.67, Dimate 4 EC,	1B	10 / (2 days)
phosmet - Imidan 70 W	1B	7 / (5 days)
b-Cyfluthrin - **Baythroid XL**	3A	7 / (12 hrs)
g-Cyhalothrin - **Bolton, Declare, Proaxis**	3A	Apply only to planted pure stands. 1 day forage, 7 day harvest (24 hrs)
l-Cyhalothrin **- Warrior II**	3A	1 d - forage, 7d – hay / (24 hrs)
a-Cypermethrin – **Fastac EC**	3A	3/(12 hrs)
z-Cypermethrin - **Mustang Maxx**	3A	3 / (12 hrs)
permethrin - **Ambush, Pounce 25 WP, etc.**	3A	Do not apply to intentionally mixed stands of forage grasses or legumes (more than 4 fl oz/ a - 14 d) / (12 hrs)
pyrethrins - PyGanic	3A	0 / (12 hrs)
l-Cyhalothrin + Chlorantraniliprole -**Besiege**	3A+28	1-forage, 7-hay / (24 hrs)

Meadow spittlebugs- A treatment is seldom, if ever, needed. If spittle masses and nymphs average more than 1 per stem and alfalfa is less than 6" tall, then an insecticide application of products such as **Baythroid XL**, **Besiege**, **Fastac**, Imidan, **Mustang Maxx, Pounce**, **or Warrior II** may be used. Control may be poor due to the protection of the insect by the spittle mass.

Fall Armyworm Control for Alfalfa and Pastures

Fall armyworm is a sporadic late summer fall pest of alfalfa and mixed stand pastures. Best time to scout for this pest is early morning as they hide from the sun at mid-day. Soapy water drenches can be used to flush larvae from the soil. This is widespread, well beyond the borders of Kentucky. Control should be considered if 2 to 3 larvae per square foot are found.

Fall Armyworm Insecticides	MOA Group	Graze/harvest – Pre Harvest Interval (days)
carbaryl - Sevin XLR, Sevin 4F, etc.	1A	7 for alfalfa (May temporarily bleach tender foliage) 14 days for pasture and grasses for hay
methomyl **- Lannate**	1A	7 days for grazing or hay (alfalfa)
bifenthrin – **Brigade 2E**	3A	Not for use on alfalfa 30 days for forage and hay

b-cyfluthrin - **Baythroid XL** (1st and 2nd instars only)	3A	1 day forage 7 days for hay (alfalfa) 0 day forage, 7 days for hay (pasture grass)
g-cyhalothrin – **Declare, Proaxis EC**	3A	1 day forage 7 days for hay (alfalfa) 0 day forage 7 days for hay (pasture grass)
l-cyhalothrin – **Warrior II**	3A	1 day forage 7 days for hay (alfalfa) 0 day forage, 7 days for hay (pasture grass)
a-cypermethrin – **Fastac EC**	3A	3 days for cutting or grazing (alfalfa)
z-cypermethrin – **Mustang Maxx**	3A	3 days for cutting or grazing (alfalfa) 0 days for cutting or grazing (grass forage and hay)
permethrin – **Ambush, Permethin 3.2 AG**	3A	0 or 14 days depending on rate used (alfalfa only)
pyrethrins - *PyGanic*	3A	0 day forage/harvest
Spinosad - Entrust	5	0 days for forage, 3 days for hay
Bt products - Agree WG, Biobit HP, DipelDF, Javelin	11	0 days
methoxyfenozide – Intrepid 2 F	18	0 day forage, 3 days for hay (alfalfa) 0 day forage, 7 days for hay (Grass forage, fodder and hay)
chlorantraniliprole – Coragen, Prevathon, Vantacor	28	0 day alfalfa 0 day for grasses grazing or hay

Insect pests of fall seeded alfalfa

Several insects can feed on new seedlings in fall-seeded stands. Generally, they are not pests in established fields but can eat or kill small seedlings. Watch new closely and examine scattered areas of the field to check for bare spots that may be due to insect feeding. Use the insecticides listed in this table to control these pests.

Beetles, Fall armyworms in Fall-seeded Stands	**MOA Group**	**Harvest or Graze – days Interval/ REI***
carbaryl - Sevin 80 XLR, Sevin 4F, etc.	1A	May temporarily bleach tender foliage. 7 / (12 hrs)
b-Cyfluthrin - **Baythroid XL**	3A	7 / (12 hrs)
g-Cyhalothrin - **Bolton, Declare, Proaxis 0.5 EC**	3A	Apply only to planted pure stands. 1 day forage, 7 day harvest (24 hrs)
l-Cyhalothrin **- Warrior II**	3A	1 d - forage, 7d – hay / (24 hrs)
a-Cypermethrin – **Fastac EC**	3A	3/(12 hrs)
z-Cypermethrin - **Mustang Maxx**	3A	3 / (12 hrs)
permethrin - **Ambush, Pounce 25 WP, etc.**	3A	Do not apply to intentionally mixed stands of forage grasses or legumes (more than 4 fl oz/a - 14 d) / (12 hrs)
pyrethrins - PyGanic	3A	0 / (12 hrs)
l-Cyhalothrin + chlorantraniliprole -**Besiege**	3A+28	1-forage, 7-hay / (24 hrs)

Grasshopper control for pastures and hay fields

Insecticides	MOA Group	Harvest or Graze – days Interval/ REI*
carbaryl - Sevin XLR, Sevin 4F, etc.	1A	May temporarily bleach tender foliage. 7 / (12 hrs)
malathion – Malathion 5EC, Cythion 5EC	1B	For grasshoppers, 0 / (12 hrs)
b-Cyfluthrin - **Baythroid XL**	3A	7 / (12 hrs)
Pyrethrins - PyGanic	3A	0 / (12 hrs)

Economic thresholds for the alfalfa weevil are determined from the size of plants, the value of the hay, the cost of insecticidal treatment, and the number of larvae per 30 stems of alfalfa (below).

Number of alfalfa weevil larvae /30 stems to justify treatment													
	Plant height (inches)												
$/ton	**12 to 18”**					**18 to 24“**					**24 to 30”**			
120	68	79	91	114		75	87	100	124		78	91	105	130
140	59	68	77	99		64	75	86	107		67	78	90	112
160	51	60	68	86		56	65	75	93		58	68	79	98
180	45	53	60	77		50	58	67	84		52	61	70	87
200	41	48	54	69		45	52	60	76		47	55	63	79
220	37	43	49	63		41	47	55	69		42	50	57	72
240	34	40	45	58		37	43	50	63		39	46	53	66
260	31	37	42	54		35	40	46	59		36	43	49	61
280	29	34	39	50		32	37	43	55		33	40	45	56
300	27	32	36	47		28	35	40	51		31	37	42	53
Cost of treatment	**$12**	**$14**	**$16**	**$20**		**$12**	**$14**	**$16**	**$20**		**$12**	**$14**	**$16**	**$20**

Table 1. Economic thresholds (# of larvae) for alfalfa weevil on plants of different sizes. If the number of weevil larvae from 30 stems exceeds the number in the table above for plants of the appropriate height, the value of hay, and insecticide cost, an insecticide treatment may be justified.
(Source: http://ento.psu.edu/extension/factsheets/alfalfa-weevil)