



INSECT PEST MANAGEMENT

Alfalfa is a superb forage, but it can be attacked by a complex of insect pests. In fact, the introduction of the alfalfa weevil about 50 years ago contributed to the decline of alfalfa acreage in Alabama. However, improved cultivars and management techniques have led to a renewed interest in alfalfa.

Alfalfa insect populations can vary greatly from field to field. Therefore, it is essential to check each alfalfa field frequently for the presence of insects or insect injury. Table 1 indicates when each insect pest is likely to be present. For optimum insect management alfalfa should be scouted weekly.

Action Thresholds for Alfalfa Pests

An action threshold is a decision-making tool that indicates when an insect population is high enough to cause significant yield loss. Listed below are the recommended action thresholds for the pests in the scouting guide.

Alfalfa Weevil. Treat when 50 percent of stems have injury and insects are present at the rate of 25 larvae per net sweep; or two larvae per stem when alfalfa is 16 inches tall; or one larva per stem when alfalfa is 10 inches tall. When the threshold is reached, harvest if alfalfa is within 10 days of

normal harvest. Otherwise, treat with an insecticide. After harvest, check to see how many alfalfa weevil larvae are present on the stubble and new regrowth. If there are more than eight larvae per square foot (five per sampling hoop), consider a stubble spray.

Pea Aphid. The action threshold depends on height of crop. When alfalfa is 15 inches tall, treat if there are 50 aphids per stem; when it is 25 inches tall, treat if there are 120 aphids per stem. Aphid populations frequently decline due to natural enemies. Do not treat for aphids unless aphid populations are high.

True Armyworm, other Caterpillars. Treat when there are two to three caterpillars (0.5 inch long or longer) per square foot (one to two per sampling hoop).

Three-Cornered Alfalfa Hopper. Treat when the insect is girdling and killing 10 percent of the lateral stems in the field—probably about three hoppers per plant.

Blister Beetles. These beetles poison livestock, particularly horses, when they are eaten along with the hay. Blister beetles are often clumped in the weedy margins of a field; spot treatment may be possible. Treat when blister beetles are discovered during weekly sweep net sampling.

Table 1. Alfalfa Insect Scouting Guide

Insects	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Alfalfa Weevil		//////////										
Pea Aphids		////////////////////////////////////										
True Armyworms			//////////									
Other Caterpillars*									-----			
Japanese Beetle						//////////						
Three-Cornered Alfalfa Hopper							////////////////////////////////////					
Blister Beetles							////////////////////////////////////					
Leafhoppers				////////////////////////////////////								
Grasshoppers									-----			

* Corn earworm, webworms, alfalfa caterpillar, green cloverworm, yellow-striped armyworm, soybean looper, beet armyworm, fall armyworm.

KEY TO RATINGS: ////////// normal; ----- may vary with season.

Grasshoppers. Treat when heavy populations are defoliating the alfalfa. This will probably be about 12 per square yard (one per sampling hoop).

Potato Leafhopper. Potato leafhopper feeding causes abnormal plant response. Only a few are needed to cause injury. Recommended thresholds are based on sweep-net sampling. Threshold is one half per sweep when alfalfa is 3 to 7 inches tall, one per sweep when 8 to 10 inches tall, and two per sweep when it is 11 to 14 inches tall. When alfalfa is taller, the yield loss will probably not be observed if it is harvested at the usual time.

Webworms. Treat when the crop is more than 2 weeks from cutting and when 25 to 30 percent of plant terminals are infested.

Sampling Equipment

Equipment needed depends on the method of measuring thresholds. When insect thresholds are based on the number of pests per stem, gently cut the stem off at the base and shake it into a bucket. When thresholds are based on number per area, use a sampling hoop that can be tossed onto the alfalfa. To make a hoop, bend the body of a wire coat hanger until it is approximately round. This should make a circle about 11 inches in diameter, which is approximately two-thirds of a square foot in area. A sweep net is useful for detecting pest populations before they cause injury. A 15-inch diameter sweep net with a muslin or sailcloth bag can be purchased from various IPM or forestry supply stores.

Organic Insecticides That Can be Applied to Alfalfa

Organic producers may want to consider the following insecticides, most if not all of which are OMRI approved. Be sure to read the insecticide label to make sure it meets your needs. The following products contain azadirachtin: Neemix 4.5, Molt-X, Ecozin Plus, Azatrol, and Azatin XL. The following products contain *Bacillus thuringiensis*: Biobit HP (subsp. *kurstaki* strain ABTS-351), Dipel ES (subsp. *kurstaki* strain ABTS-351), Dipel DF (subsp. *kurstaki* strain ABTS-351), Javelin WG (subsp. *kurstaki* strain SA-11), Lepinox WDG (subsp. *kurstaki* strain EG7826), CryMax WDG (subsp. *kurstaki* strain EG7841), Agree WG (susp. *aizawai* strain GC-91), and Xentari (subsp. *aizawai* strain ABTS-1857). PyGanic Crop Protection EC 1.4_{II} and PyGanic Crop Protection EC 5.0_{II} insecticides are OMRI approved and contain natural pyrethrins. There are other insecticides that contain pyrethrins. Be sure to choose one that does not contain piperonyl butoxide, as that chemical is not considered organic. Pest Out contains cottonseed, clove, and garlic oils. M-Pede contains potassium salts of fatty acids. Ecotec contains rosemary and peppermint oils. Entrust and Justice Fire Ant Bait contain spinosad. Other formulations of spinosad can be found. Be sure to check the labels to see if they meet the requirements for your cropping system.

Table 2. Alfalfa Control ¹

Insect Insecticide	Amount of Formulation per Acre	Lb. Active Ingredient per Acre	Minimum Days from Last Application to Harvest	Comments
Insect and Formulation				
Alfalfa Webworms, Garden Webworms				
beta-cyfluthrin				
BAYTHROID XL	1.6-2.8 fl.oz.	0.0125-0.022	7	Baythroid XL is a RESTRICTED USE pesticide.
carbaryl				
SEVIN XLR PLUS	1-1.5 qt.	1-1.5	7	
Other trade names ²				
chlorpyrifos				
LORSBAN ADVANCED	1.5 pt.	0.75	21	Lorsban Advanced is a RESTRICTED USE pesticide.
Other trade names ²				
chlorpyrifos + gamma-cyhalothrin				
COBALT	13-26 fl.oz.	0.25-0.51 + 0.004-0.009	7-14 ¹	Cobalt is a RESTRICTED USE pesticide.

¹ See Table 3 for a list of insecticides, formulations, restricted entry intervals, and days to grazing or harvest.

² See Table 3 for other trade names.

Insect	Insecticide and Formulation	Amount of Formulation per Acre	Lb. Active Ingredient per Acre	Minimum Days from Last Application to Harvest	Comments
Alfalfa Webworms, Garden Webworms (cont.)					
	chlorpyrifos + lambda-cyhalothrin COBALT ADVANCED	11-26 fl.oz.	0.26-0.51 + 0.011-0.026	7-14 ¹	Cobalt Advanced is a RESTRICTED USE pesticide.
	cyfluthrin TOMBSTONE Other trade names ²	1.6-2.8 fl.oz.	0.025-0.04	7	Tombstone is a RESTRICTED USE pesticide.
	gamma-cyhalothrin DECLARE	0.77-1.28 fl.oz.	0.0075-0.0125	7 (hay) 1 (forage)	Declare is a RESTRICTED USE pesticide.
	lambda cyhalothrin ¹ KARATE with ZEON TECHNOLOGY Other trade names ²	0.96-1.6 fl.oz.	0.015-0.025	7 (hay) 1 (forage)	Karate with Zeon Technology is a RESTRICTED USE pesticide.
	methoxyfenozide INTREPID 2F	4-8 fl.oz.	0.06-0.12	7 (hay) 0 (grazing)	Use higher rate for heavier infestations.
	permethrin POUNCE 25 WP Other trade names ²	3.2-12.8 oz.	0.05-0.2	0-14 ¹	All permethrin formulations are RESTRICTED USE pesticides.
	zeta-cypermethrin MUSTANG MAX 0.8E Other trade names ²	2.2-4 fl.oz.	0.014-0.025	3	Mustang Max is a RESTRICTED USE pesticide.
Alfalfa Weevils					
	beta-cyfluthrin BAYTHROID XL	1.6-2.8 fl.oz	0.0125-0.022	7	Baythroid XL is a RESTRICTED USE pesticide.
	carbaryl SEVIN XLR PLUS Other trade names ²	1.5 qt.	1.5	7	
	chlorpyrifos LORSBAN ADVANCED Other trade names ²	1-2 pt.	0.47-0.93	14-21 ¹	Use a minimum of 20 gallons per acre by ground. Lorsban Advanced is a RESTRICTED USE pesticide.
	chlorpyrifos + gamma-cyhalothrin COBALT	19-38 fl.oz.	0.37-0.74 + 0.007-0.013	14-21 ¹	Cobalt is a RESTRICTED USE pesticide.
	chlorpyrifos + lambda-cyhalothrin COBALT ADVANCED	16-38 fl.oz.	0.31-0.74 + 0.016-0.038	14-21 ¹	Cobalt Advanced is a RESTRICTED USE pesticide.

¹ See Table 3 for a list of insecticides, formulations, restricted entry intervals, and days to grazing or harvest.² See Table 3 for other trade names.

Insect	Insecticide and Formulation	Amount of Formulation per Acre	Lb. Active Ingredient per Acre	Minimum Days from Last Application to Harvest	Comments
Alfalfa Weevils (cont.)					
cyfluthrin	TOMBSTONE Other trade names ²	1.6-2.8 fl.oz.	0.025-0.044	7	Tombstone is a RESTRICTED USE pesticide.
gamma-cyhalothrin	DECLARE	1.02-1.54 fl.oz.	0.01-0.015	7 (hay) 1 (forage)	Declare is a RESTRICTED USE pesticide.
indoxacarb	STEWART EC	6.7-11.3 fl.oz.	0.065-0.11	7	Use 4 to 6.7 fluid ounces when 10 to 14 days of residual control are needed. Use 6.7 to 11.3 fluid ounces when longer residual control is needed.
lambda-cyhalothrin	KARATE with ZEON TECHNOLOGY Other trade names ²	1.28-1.92 fl.oz.	0.02-0.03	7 (hay) 1 (forage)	Karate is a RESTRICTED USE pesticide.
methomyl	LANNATE 2.4LV Other trade names ²	3 pt.	0.9	7	Lannate is a RESTRICTED USE pesticide.
permethrin	POUNCE 25WP Other trade names ²	6.4-12.8 oz.	0.1-0.2	0-14 ¹	FOR ROTATIONAL GRAZING: Use low rate for short-term weevil control when alfalfa is too short to graze. Graze as soon as possible for further weevil suppression. Pounce is a RESTRICTED USE pesticide.
phosmet	IMIDAN 70-W	1.0-1.33 lb.	0.7-1.0	7	
zeta-cypermethrin	MUSTANG MAX 0.8E Other trade names ²	2.2-4 fl.oz.	0.014-0.025	3	Mustang Max is a RESTRICTED USE pesticide.

¹ See Table 3 for a list of insecticides, formulations, restricted entry intervals, and days to grazing or harvest.

² See Table 3 for other trade names.

Insect	Insecticide and Formulation	Amount of Formulation per Acre	Lb. Active Ingredient per Acre	Minimum Days from Last Application to Harvest	Comments
Aphids					
chlorpyrifos	LORSBAN ADVANCED Other trade names ²	1-2 pt.	0.47-0.93	14-21 ¹	Lorsban 4E is a RESTRICTED USE pesticide.
chlorpyrifos + gamma-cyhalothrin	COBALT	13-26 fl.oz.	0.25-0.51 + 0.004-0.009	14 ¹	Cobalt is a RESTRICTED USE pesticide.
chlorpyrifos + lambda-cyhalothrin	COBALT ADVANCED	11-26 fl.oz.	0.26-0.51 + 0.011-0.026	7-14 ¹	Cobalt Advanced is a RESTRICTED USE pesticide.
dimethoate	DIMETHOATE 4EC Other trade names ²	0.5-1 pt.	0.25-0.5	10	DO NOT apply more than once per cutting.
gamma-cyhalothrin	DECLARE	1.02-1.54 fl.oz.	0.01-0.015	7 (hay) 1 (forage)	Declare is a RESTRICTED USE pesticide.
lambda-cyhalothrin	KARATE with ZEON TECHNOLOGY Other trade names ²	1.28-1.92 fl.oz.	0.02-0.03	7 (hay) 1 (forage)	Karate is a RESTRICTED USE pesticide.
methomyl	LANNATE LV	1.5-3 pt.	0.45-0.9	7	Lannate is a RESTRICTED USE pesticide.
permethrin	POUNCE 25 WP Other trade names ²	3.2-12.8 oz.	0.05-0.2	0-14 ¹	Use higher rate for higher pest pressure or for longer residual. Pounce is a RESTRICTED USE pesticide.

¹ See Table 3 for a list of insecticides, formulations, restricted entry intervals, and days to grazing or harvest.

² See Table 3 for other trade names.

Insect	Insecticide and Formulation	Amount of Formulation per Acre	Lb. Active Ingredient per Acre	Minimum Days from Last Application to Harvest	Comments
Armyworms, Corn Earworms, Fall Armyworms, Yellow-Striped Armyworms, Green Cloverworms					
beta-cyfluthrin BAYTHROID XL		1.6-2.8 fl.oz.	0.0125-0.022	7	Baythroid XL is a RESTRICTED USE pesticide. Use on small larvae (1st-2nd instar).
chlorantraniliprole CORAGEN Other trade names ²		3.5-5.0 fl.oz.	0.045-0.065	0	
chlorpyrifos + gamma-cyhalothrin COBALT		19-38 fl.oz.	0.37-0.74 + 0.007-0.013	14-21 ¹	Cobalt is a RESTRICTED USE pesticide.
chlorpyrifos + lambda-cyhalothrin COBALT ADVANCED		16-38 fl.oz.	0.31-0.74 + 0.016-0.038	14-21 ¹	Cobalt Advanced is a RESTRICTED USE pesticide.
cyfluthrin TOMBSTONE Other trade names ²		1.6-2.8 fl.oz.	0.025-0.044	7	Tombstone is a RESTRICTED USE pesticide. Use on small larvae (1st-2nd instar).
gamma-cyhalothrin DECLARE		1.02-1.54 fl.oz.	0.01-0.015	7 (hay) 1 (forage)	Declare is a RESTRICTED USE pesticide. Use on small larvae (1st-2nd instar).
indoxacarb STEWARD		6.7-11.3 fl.oz.	0.065-0.11	7	Use intermediate to higher rate on later instar larvae. One application per cutting.
lambda-cyhalothrin KARATE with ZEON TECHNOLOGY Other trade names ²		1.28-1.92 fl.oz.	0.02-0.03	7 (hay) 1 (forage)	Karate is a RESTRICTED USE pesticide. Use the higher rate for large larvae.
methomyl LANNATE 2.4LV Other trade names ²		1.5-3 pt.	0.45-0.9	7	Use higher rate for larger caterpillars or for beet armyworms. DO NOT apply to dormant or semi-dormant alfalfa when minimum daily temperature is 50°F or lower. Lannate is a RESTRICTED USE pesticide.
methoxyfenozide INTREPID 2F		4-8 fl.oz.	0.06-0.12	7 (hay) 0 (grazing)	Use higher rater for heavier infestations.
zeta-cypermethrin MUSTANG MAX 0.8E Other trade names ²		2.8-4 fl.oz.	0.07-0.025	3	Mustang Max is a RESTRICTED USE pesticide.

¹ See Table 3 for a list of insecticides, formulations, restricted entry intervals, and days to grazing or harvest.² See Table 3 for other trade names.

Insect	Insecticide and Formulation	Amount of Formulation per Acre	Lb. Active Ingredient per Acre	Minimum Days from Last Application to Harvest	Comments
Blister Beetles					
	carbaryl				
	SEVIN XLR PLUS Other trade names ²	0.5-1 qt.	0.5-1	7	
	chlorpyrifos + gamma-cyhalothrin				Cobalt is a RESTRICTED USE pesticide.
	COBALT	19-38 fl.oz.	0.37-0.74 + 0.007-0.013	14-21 ¹	
	chlorpyrifos + lambda-cyhalothrin				Cobalt Advanced is a RESTRICTED USE pesticide.
	COBALT ADVANCED	16-38 fl.oz.	0.31-0.74 + 0.016-0.038	14-21 ¹	
	gamma-cyhalothrin				Declare is a RESTRICTED USE pesticide.
	DECLARE	1.02-1.54 fl.oz.	0.01-0.015	7 (hay) 1 (forage)	
	lambda-cyhalothrin				Karate is a RESTRICTED USE pesticide.
	KARATE with ZEON TECHNOLOGY Other trade names ²	1.28-1.92 fl.oz.	0.02-0.03	7 (hay) 1 (forage)	
Cutworms, Grubs, Wireworms (at planting)					
	chlorpyrifos				FOR SUPPRESSION AT PLANTING: Apply as an in-furrow or a broadcast treatment and incorporate prior to planting.
	LORSBAN 15G Other trade names ²	6.7 lb.	1	21	
Grasshoppers					
	beta-cyfluthrin				Baythroid XL is a RESTRICTED USE pesticide.
	BAYTHROID XL	2.0-2.8 fl.oz	0.0155-0.022	7	
	carbaryl				Use 1.25 to 1.875 pounds for mature grasshoppers or applications to dense foliage.
	SEVIN XLR PLUS Other trade names ²	0.5-1.5 qt.	0.5-1.5	7	
	chlorpyrifos				Lorsban Advanced is a RESTRICTED USE pesticide.
	LORSBAN ADVANCED Other trade names ²	0.5-1 pt.	0.235-0.47	7-14 ¹	
	chlorpyrifos + gamma-cyhalothrin				Cobalt is a RESTRICTED USE pesticide.
	COBALT	7-13 fl.oz.	0.14-0.25 + 0.002-0.004	7	
	chlorpyrifos + lambda-cyhalothrin				Cobalt Advanced is a RESTRICTED USE pesticide.
	COBALT ADVANCED	6-13 fl.oz.	0.12-0.25 + 0.006-0.013	7	
	cyfluthrin				Tombstone is a RESTRICTED USE pesticide.
	TOMBSTONE Other trade names ²	2-2.8 fl.oz.	0.031-0.044	7	

¹ See Table 3 for a list of insecticides, formulations, restricted entry intervals, and days to grazing or harvest.² See Table 3 for other trade names.

Insect	Insecticide and Formulation	Amount of Formulation per Acre	Lb. Active Ingredient per Acre	Minimum Days from Last Application to Harvest	Comments
Grasshoppers (cont.)					
	dimethoate				
	DIMETHOATE 4EC Other trade names ²	0.5-1 pt.	0.25-0.5	10	
	gamma-cyhalothrin				
	DECLARE	1.02-1.54 fl.oz.	0.01-0.015	7 (hay) 1 (forage)	Declare is a RESTRICTED USE pesticide.
	lambda cyhalothrin ¹				
	KARATE with ZEON TECHNOLOGY	1.28-1.92 fl.oz.	0.02-0.03	7 (hay) 1 (forage)	Karate is a RESTRICTED USE pesticide.
	phosmet				
	IMIDAN 70-W	1.0-1.33 lb.	0.7-1.0	7	
	zeta-cypermethrin				
	MUSTANG MAX Other trade names ²	2.8-4 fl.oz.	0.018-0.025	3	Mustang Max is a RESTRICTED USE pesticide.
Imported Fire Ants					
	s-methoprene				
	EXTINGUISH PROFESSIONAL ANT BAIT	1-1.5 lb.	0.005-0.0075	0	Broadcast the bait according to label directions.
Japanese Beetle Adults					
	beta-cyfluthrin				
	BAYTHROID XL	1.6-2.8 fl.oz	0.0125-0.022	7	Baythroid XL is a RESTRICTED USE pesticide.
	carbaryl				
	SEVIN XLR PLUS Other trade names ²	1 qt.	1	7	
	chlorpyrifos + gamma-cyhalothrin				
	COBALT	19-38 fl.oz.	0.25-0.51 + 0.004-0.009	14-21 ¹	Cobalt is a RESTRICTED USE pesticide.
	chlorpyrifos + lambda-cyhalothrin				
	COBALT ADVANCED	16-38 fl.oz.	0.31-0.74 + 0.016-0.038	14-21 ¹	Cobalt Advanced is a RESTRICTED USE pesticide.
	cyfluthrin				
	TOMBSTONE Other trade names ²	1.6-2.8 fl.oz.	0.025-0.044	7	Tombstone is a RESTRICTED USE pesticide.
	gamma-cyhalothrin				
	DECLARE	1.02-1.54 fl.oz.	0.01-0.015	7 (hay) 1 (forage)	Declare is a RESTRICTED USE pesticide.
	lambda-cyhalothrin				
	KARATE with ZEON TECHNOLOGY Other trade names ²	1.28-1.92 fl.oz.	0.02-0.03	7 (hay) 1 (forage)	Karate is a RESTRICTED USE pesticide.

¹ See Table 3 for a list of insecticides, formulations, restricted entry intervals, and days to grazing or harvest.² See Table 3 for other trade names.

Insect	Insecticide and Formulation	Amount of Formulation per Acre	Lb. Active Ingredient per Acre	Minimum Days from Last Application to Harvest	Comments
Potato Leafhoppers					
	beta-cyfluthrin				
	BAYTHROID XL	0.8-1.6 fl.oz.	0.0065-0.0125	7	Baythroid XL is a RESTRICTED USE pesticide.
	carbaryl				
	SEVIN XLR PLUS Other trade names ²	1 qt.	1.0	7	Carbaryl may bleach tender foliage. DO NOT apply when crop is wet.
	chlorpyrifos				
	LORSBAN ADVANCED Other trade names ²	0.5-1 pt.	0.235-0.47	7-14 ¹	Some phytotoxic symptoms may be observed on young, tender growth. Lorsban Advanced is a RESTRICTED USE pesticide.
	chlorpyrifos + gamma-cyhalothrin				
	COBALT	7-13 fl.oz.	0.14-0.25 + 0.002-0.004	7	Cobalt is a RESTRICTED USE pesticide.
	chlorpyrifos + lambda-cyhalothrin				
	COBALT ADVANCED	6-13 fl.oz.	0.12-0.25 + 0.006-0.013	7	Cobalt Advanced is a RESTRICTED USE pesticide.
	cyfluthrin				
	TOMBSTONE Other trade names ²	0.8-1.6 fl.oz.	0.013-0.025	7	Tombstone is a RESTRICTED USE pesticide.
	dimethoate				
	DIMETHOATE 4EC Other trade names ²	0.5-1 pt.	0.25-0.5	10	
	gamma-cyhalothrin				
	DECLARE	0.77-1.28 fl.oz.	0.0075-0.0125	7 (hay) 1 (forage)	Declare is a RESTRICTED USE pesticide.
	lambda-cyhalothrin				
	KARATE with ZEON TECHNOLOGY Other trade names ²	0.96-1.60 fl.oz.	0.015-0.025	7 (hay) 1 (forage)	Karate is a RESTRICTED USE pesticide.
	malathion				
	MALATHION 5 Other trade names ²	1.5-2 pt.	0.94-1.25	0	
	permethrin				
	POUNCE 25WP Other trade names ²	6.4-12.8 oz.	0.1-0.2	0-14 ¹	Pounce is a RESTRICTED USE pesticide.
	zeta-cypermethrin				
	MUSTANG MAX 0.8E Other trade names ²	2.2-4 fl.oz.	0.014-0.025	3	Mustang Max is a RESTRICTED USE pesticide.

¹ See Table 3 for a list of insecticides, formulations, restricted entry intervals, and days to grazing or harvest.² See Table 3 for other trade names.

Insect	Insecticide and Formulation	Amount of Formulation per Acre	Lb. Active Ingredient per Acre	Minimum Days from Last Application to Harvest	Comments
Three-Cornered Alfalfa Hoppers					
	beta-cyfluthrin BAYTHROID XL	1.6-2.8 fl.oz.	0.0125-0.022	7	Baythroid XL is a RESTRICTED USE pesticide.
	carbaryl SEVIN XLR PLUS Other trade names ²	1 qt.	1	7	
	chlorpyrifos + gamma-cyhalothrin COBALT	19-38 fl.oz.	0.37-0.74 + 0.007-0.013	14-21 ¹	Cobalt is a RESTRICTED USE pesticide.
	chlorpyrifos + lambda-cyhalothrin COBALT ADVANCED	16-38 fl.oz.	0.31-0.74 + 0.016-0.038	14-21 ¹	Cobalt Advanced is a RESTRICTED USE pesticide.
	cyfluthrin TOMBSTONE	1.6-2.8 fl.oz.	0.025-0.044	7	Tombstone is a RESTRICTED USE pesticide.
	gamma-cyhalothrin DECLARE	0.77-1.28 fl.oz.	0.0075-0.0125	7 (hay) 1 (forage)	Declare is a RESTRICTED USE pesticide.
	lambda-cyhalothrin KARATE with ZEON TECHNOLOGY Other trade names ²	0.96-1.60 fl.oz.	0.015-0.025	7 (hay) 1 (forage)	Karate is a RESTRICTED USE pesticide.
	zeta-cypermethrin MUSTANG MAX 0.8E Other trade names ²	2.2-4 fl.oz.	0.014-0.025	3	Mustang Max is a RESTRICTED USE pesticide.

¹ See Table 3 for a list of insecticides, formulations, restricted entry intervals, and days to grazing or harvest.

² See Table 3 for other trade names.

Table 3. Insecticides Labeled for Use on Alfalfa

Insecticide and Trade Name	A.I./ Product	Formulation	Restricted Entry Interval (hr)	Minimum Days from Last Application to Harvest (h) or Grazing (g)
beta-cyfluthrin *MoA Group 3A				
BAYTHROID XL (Restricted Use)	1 lb./gal.	emulsifiable concentrate	12	7
carbaryl MoA Group 1A				
SEVIN 4F	4 lb./gal.	liquid suspension	12	7
SEVIN XLR PLUS	4 lb./gal.	liquid suspension	12	7
CARBARYL 4L, others	4 lb./gal.	liquid suspension	12	7
SEVIN 80S	12.8 oz./lb.	wettable powder	12	7
SEVIN 80 SOLUPAK	12.8 oz./lb.	water soluble packet	12	7
SEVIN 80WSP	12.8 oz./lb.	water soluble packet	12	7
chlorantraniliprole MoA Group 28				
CORAGEN	1.67 lb./gal.	suspension concentrate	4	0
PREVATHON	0.43 lb./gal.	suspension concentrate	4	0
chlorpyrifos MoA Group 1B				
LORSBAN 4E (Restricted Use)	4 lb./gal.	emulsifiable concentrate	24	7 (0.5 pt./A) 14 (1 pt./A) 21 (>1 pt./A)
LORSBAN ADVANCED (Restricted Use)	3.755 lb./gal.	water emulsion	24	Same as above
GOVERN (Restricted Use)	4 lb./gal.	emulsifiable concentrate	24	Same as above
HATCHET (Restricted Use)	4 lb./gal.	emulsifiable concentrate	24	Same as above
CHLORPYRIFOS 4E AG (Restricted Use)	4 lb./gal.	emulsifiable concentrate	24	Same as above
NUFOS 4E (Restricted Use)	4 lb./gal.	emulsifiable concentrate	24	Same as above
WARHAWK (Restricted Use)	4 lb./gal.	emulsifiable concentrate	24	Same as above
WHIRLWIND (Restricted Use)	4 lb./gal.	emulsifiable concentrate	24	Same as above
YUMA 4E (Restricted Use)	4 lb./gal.	emulsifiable concentrate	24	Same as above
LORSBAN 75WG	12 oz./lb.	water dispersible granule	24	7 (0.33 lb./A) 14 (0.67 lb./A) 21 (>0.67 lb./A)
LORSBAN 15G	2.4 oz./lb.	granular	24	21
SAURUS	2.4 oz./lb.	granular	24	21
chlorpyrifos + gamma-cyhalothrin MoA Group 1B + MoA Group 3A				
COBALT (Restricted Use)	2.5 lb./gal. + 0.045 lb./gal.	emulsifiable concentrate	24	7 (≤13 fl.oz./A) 14 (13.1-26 fl.oz./A) 21 (>26 fl.oz./A)

*MoA = Mode of Action classification from the Insecticide Resistance Action Committee (www.irac-online.org).
Insecticides with different MoAs should be used for insecticide resistance management.

Insecticide and Trade Name	A.I./ Formulated Product	Formulation	Restricted Entry Interval (hr)	Minimum Days from Last Application to Harvest (h) or Grazing (g)
chlorpyrifos + lambda-cyhalothrin MoA Group 1B + MoA Group 3A				
COBALT ADVANCED (Restricted Use)	2.5 lb./gal. + 0.0129 lb./gal.	emulsifiable concentrate	24	7 (6-13 fl.oz./A) 14 (13-26 fl.oz./A) 21 (>26 fl.oz./A)
cyfluthrin MoA Group 3A				
RENOUNCE 20WP (Restricted Use)	3.2 oz./lb.	wettable powder	12	7
TOMBSTONE (Restricted Use)	2 lb./gal.	emulsifiable concentrate	12	7
TOMBSTONE HELIOS	2 lb./gal.	emulsifiable concentrate	12	7
dimethoate MoA Group 1B				
DIMETHOATE 4E	4 lb./gal.	emulsifiable concentrate	48	10
DIMATE 4E	4 lb./gal.	emulsifiable concentrate	48	10
DIMATE 4EC	4 lb./gal.	emulsifiable concentrate	48	10
DIMETHOATE 400	4 lb./gal.	emulsifiable concentrate	48	10
DIMETHOATE 4EC	4 lb./gal.	emulsifiable concentrate	48	10
gamma-cyhalothrin MoA Group 3A				
PROAXIS (Restricted Use)	0.5 lb./gal.	microencapsulated suspension	24	7 (h), 1 (g)
DECLARE (Restricted Use)	1.25 lb./gal.	microencapsulated suspension	24	7 (h), 1 (g)
indoxacarb MoA Group 22A				
STEWARD EC	1.25 lb./gal.	emulsifiable concentrate	12	7
lambda-cyhalothrin MoA Group 3A				
KARATE with ZEON TECHNOLOGY (Restricted Use)	2.08 lb./gal.	capsule suspension	24	7 (h), 1 (g)
LAMBDASTAR (Restricted Use)	1 lb./gal.	emulsifiable concentrate	24	7 (h), 1 (g)
LAMBDASTAR 1CS (Restricted Use)	1 lb./gal.	emulsifiable concentrate	24	7 (h), 1 (g)
LAMBDA-T (Restricted Use)	1 lb./gal.	capsule suspension	24	7 (h), 1 (g)
SILENCER (Restricted Use)	1 lb./gal.	emulsifiable concentrate	24	7 (h), 1 (g)
TAIGA Z (Restricted Use)	1 lb./gal.	capsule suspension	24	7 (h), 1 (g)
GRIZZLY Z (Restricted Use)	1 lb./gal.	emulsifiable concentrate	24	7 (h), 1 (g)
LAMBDA-CY (Restricted Use)	1 lb./gal.	emulsifiable concentrate	24	7 (h), 1 (g)
LAMCAP (Restricted Use)	1 lb./gal.	capsule suspension	24	7 (h), 1 (g)
KAISO 24WG (Restricted Use)	0.24 lb./ 1 lb.	wettable granule	24	7 (h), 1 (g)

Insecticide and Trade Name	A.I./ Formulated Product	Formulation	Restricted Entry Interval (hr)	Minimum Days from Last Application to Harvest (h) or Grazing (g)
malathion MoA Group 1B				
MALATHION 5	5 lb./gal.	emulsifiable concentrate	12	0
MALATHION 8	8 lb./gal.	emulsifiable concentrate	12	0
MALATHION 57EC	5 lb./gal.	emulsifiable concentrate	12	0
FYFANON	5 lb./gal.	emulsifiable concentrate	12	0
FYFANON ULV AG	9.9 lb./gal.	emulsifiable concentrate	12	0 (\leq 8 fl.oz.) 5 ($>$ 8 fl.oz.)
methomyl MoA Group 1A				
LANNATE LV (Restricted Use)	2.4 lb./gal.	water soluble liquid	48	7
LANNATE SP (Restricted Use)	14.4 oz./lb.	water soluble bags	48	7
methoxyfenozide MoA Group 18				
INTREPID 2F	2.0 lb./gal.	liquid	4	7 (h), 0 (g)
permethrin MoA Group 3A				
AMBUSH 25 WP (Restricted Use)	4 oz./lb.	wettable powder	12	0 (\leq 0.1 lb.a.i./A) 14 ($>$ 0.1 lb.a.i./A)
PERMETHRIN 3.2EC, others (Restricted Use)	3.2 lb./gal.	emulsifiable concentrate	12	Same as above
PERM-UP 3.2EC (Restricted Use)	3.2 lb./gal.	emulsifiable concentrate	12	Same as above
POUNCE 25 WP (Restricted Use)	4 oz./lb.	wettable powder	12	Same as above
ARCTIC 3.2EC (Restricted Use)	3.2 lb./gal.	emulsifiable concentrate	12	Same as above
PERMETHRIN (Restricted Use)	3.2 lb./gal.	emulsifiable concentrate	12	Same as above
PERMASTAR AG	3.2 lb./gal.	emulsifiable concentrate	12	Same as above
phosmet MoA Group 1B				
IMIDAN 70-W	11.2 oz./lb.	wettable powder or water soluble bag	120	7
s-methoprene MoA Group 7A				
EXTINGUISH PROFESSIONAL FIRE ANT BAIT	0.08 oz./lb. (0.5%)	fire ant bait	4	0
zeta-cypermethrin MoA Group 3A				
MUSTANG MAX (Restricted Use)	0.8 lb./gal.	liquid	12	3 (h,g) 7 (seed)
RESPECT (Restricted Use)	0.8 lb./gal.	liquid	12	3 (h,g) 7 (seed)

WEED CONTROL

Table 4. Alfalfa Weed Control

Herbicide Trade Name (Rate/Acre Broadcast)	Herbicide Common Name (Active Herbicide/Acre)	Comments
Preplant Incorporated		
BALAN 60DF (2 lb.)	benefin (1.2 lb.)	Controls many annual grasses and small-seeded broadleaf weeds such as pigweed and lambsquarter. Apply just prior to planting and incorporate thoroughly into the soil 2 to 3 inches deep within 8 hours of application. Usually less injurious on coarse soils.
EPTAM 7E (3.5 pt.)	EPTC (3 lb.)	Controls many annual grasses and small-seeded broadleaf weeds and suppresses nutsedge. Apply just prior to planting and incorporate 3 inches deep immediately after application (within 30 minutes). Some temporary injury to alfalfa seedlings should be expected if conditions for germination and growth are not optimum. Alfalfa is sensitive to soil residues of atrazine. DO NOT use EPTAM on alfalfa if atrazine was applied within the previous 12 months.
Postemergence (Seedling Alfalfa)		
BUTYRAC 200 2,4-DB 200 (1-3 qt.) or 2,4-DB 175 (2.5-6.5 pt.)	2,4-DB (0.5-1.5 lb.) (0.5-1.42 lb.)	Controls many annual and some perennial broadleaf weeds. Does not control chickweed. Apply after alfalfa has three or more true leaves. Apply when weeds are no more than 3 inches tall and when temperature is 60°F or above. DO NOT graze seedling alfalfa or cut for hay within 60 days of application.
KERB 50W (1-1.5 lb.)	pronamide (0.5-0.75 lb.)	Controls chickweed, annual grasses, and other winter annuals. Apply to fall-seeded alfalfa when temperatures are less than 55°F after seedlings are beyond the first true leaf stage. DO NOT graze or harvest for forage within 120 days after application. Kerb is a RESTRICTED USE pesticide.
POAST 1.5 (1-1.5 pt.) or POAST PLUS 1.0 (1.5-2.25 pt.) + Crop Oil Concentrate (2 pt.)	sethoxydim (0.19-0.28 lb.) +	Apply over-the-top of alfalfa for control of annual and perennial grasses. Annual grasses should be treated when they are 4 to 8 inches tall except for crabgrass and goosegrass which should be treated before reaching 4 inches. Johnsongrass should be 15 to 20 inches for Poast application. Use the low rate for annual grass control and the high rate for johnsongrass control. A second application may be necessary if regrowth of perennial grasses occurs. Use a minimum of 10 gallons of spray mix per acre and 40-psi nozzle pressure to ensure thorough spray coverage. DO NOT apply with any other pesticide. DO NOT graze treated areas within 7 days of treatment and DO NOT harvest for hay within 14 days of treatment. DO NOT use more than 6.5 pints of Poast or 9.75 pints of Poast Plus per acre per season. Poast does not control sedges (nutgrass).

Herbicide Trade Name (Rate/Acre Broadcast)	Herbicide Common Name (Active Herbicide/Acre)	Comments
Postemergence (Seedling Alfalfa) (cont.)		
PROWL H ₂ O (1.1-2.1 pt.) [3.8 lb./gal.]	pendimethalin (0.5-1 lb.)	Apply to seedling alfalfa before annual weed emergence and after alfalfa has developed two trifoliolate leaves. Application should be made before alfalfa exceeds 6 inches in height. DO NOT cut for hay or forage for 28 days after application. Provides good to excellent preemergence control of annual grasses and some annual broadleaf weeds.
PURSUIT 2EC (3-6 oz.) +	imazethapyr (0.047-0.094 lb.) +	Apply when seedling alfalfa is in the second trifoliolate leaf stage or larger when weeds are 1 to 3 inches tall. There may be temporary discoloration of seedling alfalfa. Add liquid fertilizer (28% N, 32% N, or 10-34-0) at 1 to 2 quarts per acre or spray grade ammonium sulfate at 2.5 pounds per acre to the spray mix. DO NOT feed, graze, or harvest hay for 30 days after application.
Crop Oil Concentrate (1.25 gal./100 gal. spray mix) or	crop oil concentrate or	
Non-ionic Surfactant (2 pt./100 gal. spray mix)	non-ionic surfactant	
RAPTOR (4-6 fl.oz.) [1 lb./gal.] +	imazamox (0.031-0.047 lb.) +	Apply when seedling alfalfa is in the second trifoliolate leaf stage or larger and when weeds are 1 to 3 inches tall. A temporary growth reduction may occur after application. A maximum total of 6 fluid ounces per acre may be applied per season. Always add a non-ionic surfactant or crop oil concentrate to the spray mix.
Non-ionic Surfactant (2 pt./100 gal. spray mix) or	non-ionic surfactant or	
Crop Oil Concentrate (1 gal./100 gal. spray mix)	crop oil concentrate	
SELECT 2EC ARROW (10-16 oz.) or	clethodim (0.16-0.25 lb.) or	Apply over-the-top of seedling alfalfa to control many actively growing annual grasses. DO NOT apply within 15 days of grazing, feeding, or harvesting for hay. DO NOT plant rotational crops within 30 days of application. DO NOT apply 2,4-DB as a tank mix with Select unless a 60-day harvest restriction can be observed. Always add a crop oil concentrate (1 gallon per 100 gallons spray mix) to Arrow or Select 2EC spray. For Select Max, add either a crop oil concentrate or a non-ionic surfactant (1 quart per 100 gallons of Select Max spray mix) to spray mix.
SELECT MAX 0.97E (9-32 oz.)	(0.07-0.24 lb.)	
Preemergence (Established Alfalfa)		
PROWL H ₂ O (1.1-4.2 pt.) [3.8 lb./gal.]	pendimethalin (1.05-4 lb.)	In established alfalfa (defined as alfalfa that was planted in the fall or spring and has gone through a first cutting/mowing), Prowl may be applied in the fall after last cutting during winter dormancy or in spring before alfalfa regrowth exceeds 6 inches. Provides good to excellent preemergence control of annual grasses and some annual broadleaf weeds. DO NOT harvest for hay or graze for 28 days after application of 2.1 quarts per acre or less. If Prowl is applied at more than 2.1 quarts per acre, the grazing and hay harvesting restriction is 50 days.
SOLICAM DF (1.25-2.5 lb.)	norflurazon (1-2 lb.)	Apply to established alfalfa in spring or early fall for the control of annual grasses and broadleaf weeds such as crabgrass, teaweed, and tropic croton. Apply to actively growing alfalfa following hay removal to ensure good spray coverage on soil surface. DO NOT apply to seedling alfalfa earlier than 5 months after emergence. DO NOT apply within 28 days of harvest. Use low rate on sandy-textured soils.

Herbicide Trade Name (Rate/Acre Broadcast)	Herbicide Common Name (Active Herbicide/Acre)	Comments
Postemergence (Established Alfalfa)		
BUTYRAC 200 2,4-DB (2-3 qt.) or 2,4-DB 175 (4.5-6.5 pt.)	2,4-DB (1-1.5 lb.) (1-1.42 lb.)	Controls many annual and some perennial broadleaf weeds. Does not control chickweed. Apply when weeds are no more than 3 inches tall and when temperature is 60°F or above. DO NOT graze established alfalfa or hay from treated established alfalfa to livestock within 30 days of application.
FIRESTORM 3 (0.7 pt.) or GRAMOXONE INTEON 2 (1 pt.) + Non-ionic Surfactant (1-2 pt./100 gal. spray mix)	paraquat (0.25 lb.) + non-ionic surfactant	Apply to established alfalfa stands at least 1 year old immediately after the alfalfa has been removed for hay or silage. DO NOT treat later than 5 days after cutting and DO NOT graze or cut within 30 days of application. Apply to small weeds using a minimum of 10 gallons of water per acre. Paraquat is a RESTRICTED USE pesticide.
KERB 50W (1-1.5 lb.)	pronamide (0.5-0.75 lb.)	Controls chickweed, annual grasses, and other winter annuals. Make application in fall after last cutting when day temperatures are less than 55°F. DO NOT graze or harvest for forage within 120 days after application. DO NOT tank-mix with other herbicides. Kerb is a RESTRICTED USE pesticide.
POAST 1.5 (1-1.5 pt.) or POAST PLUS 1.0 (1.5-2.25 pt.) + Crop Oil Concentrate (2 pt.)	sethoxydim (0.19-0.28 lb.) + crop oil concentrate	Apply over-the-top of alfalfa for control of annual and perennial grasses. Annual grasses should be treated when they are 4 to 8 inches tall except for crabgrass and goosegrass which should be treated before reaching 4 inches. Johnsongrass should be 15 to 20 inches for Poast application. Use the low rate for annual grass control and the high rate for johnsongrass control. A second application may be necessary if regrowth of perennial grasses occurs. Use a minimum of 10 gallons of spray mix per acre and 40-psi nozzle pressure to ensure thorough spray coverage. DO NOT apply with any other pesticide. DO NOT graze treated areas within 7 days of treatment and DO NOT harvest for hay within 14 days of treatment. DO NOT use more than 6.5 pints of Poast or 9.75 pints of Poast Plus per acre per season. Poast does not control sedges (nutgrass).
PURSUIT 2EC (3-6 fl.oz.) + Crop Oil Concentrate (1.25 gal./100 gal. spray mix) or Non-ionic Surfactant (2 pt./100 gal. spray mix)	imazethapyr (0.047-0.094 lb.) + crop oil concentrate or non-ionic surfactant	Apply in the fall or spring to dormant or semi-dormant (less than 3 inches new growth) established alfalfa or between cuttings. Spray must contact target weeds. DO NOT apply more than 6 fluid ounces per acre per year. DO NOT replant alfalfa for 4 months after last application. See label for other recropping time intervals. DO NOT feed, graze, or harvest alfalfa for 30 days after application.
RAPTOR (4-6 fl.oz.) [1 lb./gal.] + Non-ionic Surfactant (2 pt./100 gal. spray mix) or Crop Oil Concentrate (1 gal./100 gal. spray mix)	imazamox (0.031-0.047 lb.) + non-ionic surfactant or crop oil concentrate	Apply to established alfalfa in the fall or in the spring to dormant or semi-dormant alfalfa. Spring treatment should be made when alfalfa has less than 3 inches of new growth. Apply when weeds are 1 to 3 inches tall. A temporary growth reduction may occur following application. DO NOT feed, graze, or harvest alfalfa for 20 days after application. DO NOT apply more than 6 fluid ounces of Raptor per season. Always add a non-ionic surfactant or crop oil concentrate to the spray mix.

Herbicide Trade Name (Rate/Acre Broadcast)	Herbicide Common Name (Active Herbicide/Acre)	Comments
Postemergence (Established Alfalfa) (cont.)		
ROUNDUP WEATHERMAX POWERMAX (44 fl.oz.) [5.5 lb./gal.]	glyphosate (1.9 lb.)	USE ONLY ON ALFALFA VARIETIES DESIGNATED AS CONTAINING A ROUNDUP READY GENE. May be applied at any alfalfa growth stage. Sequential applications may be made at least 7 days apart. Each application should not exceed 44 fluid ounces per acre and total application should not exceed 4.1 quarts per acre per year. Wait 5 days after last application before grazing or cutting for hay. Not all formulations of glyphosate are labeled for this use. See specific product label for registered uses and the need for addition of a non-ionic surfactant.
SELECT 2EC ARROW (10-16 oz.) or SELECT MAX 0.97E (9-32 oz.)	clethodim (0.16-0.25 lb.) (0.07-0.24 lb.)	Apply over-the-top of established alfalfa to control actively growing annual grasses. Can be tank mixed with 2,4-DB to broaden spectrum of weeds controlled. See additional remarks for Select under Seedling Alfalfa section. DO NOT graze or harvest for hay for 15 days after treatment. Always add a crop oil concentrate (1 gallon per 100 gallons spray mix) to Arrow or Select 2EC spray. For Select Max, add either a crop oil concentrate or a non-ionic surfactant (1 quart per 100 gallons of Select Max spray mix) to spray mix.

Weed Control section prepared by John W. Everest, Professor Emeritus, Agronomy and Soils, Auburn University.

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For more information, contact your county Extension office. Visit <http://www.aces.edu/counties> or look in your telephone directory under your county's name to find contact information.

Use pesticides **only** according to the directions on the label. Follow all directions, precautions, and restrictions that are listed. Do not use pesticides on plants that are not listed on the label.

The pesticide rates in this publication are recommended **only** if they are registered with the Environmental Protection Agency or the Alabama Department of Agriculture and Industries. If a registration is changed or canceled, the rate listed here is no longer recommended. Before you apply **any** pesticide, check with your county Extension agent for the latest information.

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