



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 in the early 1960s 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.

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 (1) 25 larvae per net sweep; or (2) two larvae per stem when alfalfa is 16 inches tall; or (3) 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. Treat when there are two per square foot, about one per sampling hoop. Blister beetles are often clumped in the weedy margins of a field; spot treatment may be possible.

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.

Table 2. Alfalfa Insect Control ¹

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					
beta-cyfluthrin BAYTHROID XL		1.6-2.8 fl.oz.	0.0125-0.022	7	Baythroid XL is a RESTRICTED USE pesticide.
carbaryl SEVIN 80S Other trade names ²		1.25-1.62 lb.	1-1.3	7	
cyfluthrin BAYTHROID 2 Other trade names ²		1.6-2.8 fl.oz.	0.025-0.04	7	Baythroid 2 is a RESTRICTED USE pesticide.
gamma-cyhalothrin PROAXIS		1.9-3.2 fl.oz.	0.0075-0.0125	7 (hay) 1 (forage)	Proaxis is a RESTRICTED USE pesticide.
lambda cyhalothrin ¹ WARRIOR with ZEON TECHNOLOGY Other trade names ²		1.9-3.2 fl.oz.	0.015-0.025	7 (hay) 1 (forage)	Warrior 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	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.

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

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.)					
	carbaryl				
	SEVIN 80S	1.87 lb.	1.5	7	
	Other trade names ²				
	carbofuran				
	FURADAN 4F	0.5-1 qt.	0.5-1	14-28 ¹	Apply when 50 percent of plant terminals show light damage. DO NOT apply more than once per year. Furadan is a RESTRICTED USE pesticide.
	FURADAN 4F	0.25 qt.	0.25	7	FOR SPRING GRAZING: Furadan at the low rate may be used to control early-season weevil larvae when alfalfa is too short to graze. Graze as soon as possible after grazing restriction is over for further weevil control. Furadan is a RESTRICTED USE pesticide.
	chlorpyrifos				
	LORSBAN 4E	1-2 pt.	0.5-1	14-21 ¹	Use a minimum of 20 gallons per acre by ground. Lorsban is a RESTRICTED USE pesticide.
	Other trade names ²				
	cyfluthrin				
	BAYTHROID 2	1.6-2.8 fl.oz.	0.025-0.044	7	Baythroid 2 is a RESTRICTED USE pesticide.
	Other trade names ²				
	gamma-cyhalothrin				
	PROAXIS	2.6-3.8 fl. oz.	0.01-0.015	7 (hay) 1 (forage)	Proaxis is a RESTRICTED USE pesticide.
	indoxacarb				
	STEWARD EC	4-11.3 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				
	WARRIOR with ZEON TECHNOLOGY	2.6-3.8 fl.oz.	0.02-0.03	7 (hay) 1 (forage)	Warrior is a RESTRICTED USE pesticide.
	Other trade names ²				
	methomyl				
	LANNATE 2.4LV	3 pt.	0.9	7	Lannate is a RESTRICTED USE pesticide.
	Other trade names ²				
	permethrin				
	POUNCE 25WP	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.
	Other trade names ²				
	zeta-cypermethrin				
	MUSTANG MAX 0.8E	2.2-4 fl.oz.	0.014-0.025	3	Mustang Max is a RESTRICTED USE pesticide.
	Other trade names ²				

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 4E Other trade names ²	1-2 pt.	0.5-1	14-21 ¹	Lorsban 4E 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 PROAXIS	2.6-3.8 fl.oz.	0.01-0.015	7 (hay) 1 (forage)	Proaxis is a RESTRICTED USE pesticide.	
lambda-cyhalothrin WARRIOR with ZEON TECHNOLOGY Other trade names ²	2.6-3.8 fl.oz.	0.02-0.03	7 (hay) 1 (forage)	Warrior 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.	
Blister Beetles					
carbaryl SEVIN 80S Other trade names ²	0.67-1.25 lb.	0.5-1	7		
gamma-cyhalothrin PROAXIS	2.6-3.8 fl.oz.	0.01-0.015	7 (hay) 1 (forage)	Proaxis is a RESTRICTED USE pesticide.	
lambda-cyhalothrin WARRIOR with ZEON TECHNOLOGY Other trade names ²	2.6-3.8 fl.oz.	0.02-0.03	7 (hay) 1 (forage)	Warrior is a RESTRICTED USE pesticide.	
Cutworms, Grubs, Wireworms					
chlorpyrifos LORSBAN 15G Other trade names ²	6.7 lb.	1	21	FOR SUPPRESSION AT PLANTING: Apply as an in-furrow or a broadcast treatment and incorporate prior to planting.	
Grasshoppers					
beta-cyfluthrin BAYTHROID XL	2.0-2.8 fl.oz	0.0155-0.022	7	Baythroid XL is a RESTRICTED USE pesticide.	
carbaryl SEVIN 80S Other trade names ²	0.675-1.875 lb.	0.5-1.5	7	Use 1.25 to 1.875 pounds for mature grasshoppers or applications to dense foliage.	
chlorpyrifos LORSBAN 4E Other trade names ²	0.5-1 pt.	0.25-0.5	14	Lorsban 4E is a RESTRICTED USE pesticide.	

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.)					
	cyfluthrin				
	BAYTHROID 2	2.8 fl.oz.	0.044	7	Baythroid 2 is a RESTRICTED USE pesticide.
	Other trade names ²				
	dimethoate				
	DIMETHOATE 4EC	0.5-1 pt.	0.25-0.5	10	
	Other trade names ²				
	gamma-cyhalothrin				
	PROAXIS	2.6-3.8 fl.oz.	0.01-0.015	7 (hay) 1 (forage)	Proaxis is a RESTRICTED USE pesticide.
	lambda cyhalothrin ¹				
	WARRIOR with ZEON TECHNOLOGY	2.6-3.8 fl.oz.	0.02-0.07	7 (hay) 1 (forage)	Warrior is a RESTRICTED USE pesticide.
	zeta-cypermethrin				
	MUSTANG MAX	2.8-4 fl.oz.	0.018-0.025	3	Mustang Max is a RESTRICTED USE pesticide.
	Other trade names ²				
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 80S	1.25 qt.	1	7	
	Other trade names ²				
	cyfluthrin				
	BAYTHROID 2	1.6-2.8 fl.oz.	0.025-0.044	7	Baythroid 2 is a RESTRICTED USE pesticide.
	Other trade names ²				
	gamma-cyhalothrin				
	PROAXIS	2.6-3.8 fl. oz.	0.01-0.015	7 (hay) 1 (forage)	Proaxis is a RESTRICTED USE pesticide.

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
Japanese Beetle Adults (cont.)					
	lambda-cyhalothrin				Warrior is a RESTRICTED USE pesticide.
	WARRIOR with ZEON TECHNOLOGY	2.56-3.84 fl.oz.	0.02-0.03	7 (hay) 1 (forage)	
	Other trade names ²				
Potato Leafhoppers					
	beta-cyfluthrin				Baythroid XL is a RESTRICTED USE pesticide.
	BAYTHROID XL	0.8-1.6 fl.oz	0.0065-0.0125	7	
	carbaryl				Carbaryl may bleach tender foliage. DO NOT apply when crop is wet.
	SEVIN 80S	1.25 lb.	1	7	
	Other trade names ²				
	chlorpyrifos				Some phytotoxic symptoms may be observed on young, tender growth. Lorsban 4E is a RESTRICTED USE pesticide.
	LORSBAN 4E	0.5-1 pt.	0.25-0.5	7-14 ¹	
	Other trade names ²				
	cyfluthrin				Baythroid 2 is a RESTRICTED USE pesticide.
	BAYTHROID 2	0.8-1.6 fl.oz.	0.013-0.025	7	
	Other trade names ²				
	dimethoate				
	DIMETHOATE 4EC	0.5-1 pt.	0.25-0.5	10	
	Other trade names ²				
	gamma-cyhalothrin				Proaxis is a RESTRICTED USE pesticide.
	PROAXIS	1.9-3.2 fl.oz.	0.0075-0.0125	7 (hay) 1 (forage)	
	indoxacarb				
	STEWARD EC	9.2-11.3 fl.oz.	0.09-0.11	7	
	lambda-cyhalothrin				Warrior is a RESTRICTED USE pesticide.
	WARRIOR with ZEON TECHNOLOGY	1.9-3.2 fl.oz.	0.015-0.025	7 (hay) 1 (forage)	
	Other trade names ²				
	malathion				
	MALATHION 5	1.5-2 pt.	0.94-1.25	7	
	Other trade names ²				
	permethrin				Pounce is a RESTRICTED USE pesticide.
	POUNCE 25WP	6.4-12.8 oz.	0.1-0.2	0-14 ¹	
	Other trade names ²				
	zeta-cypermethrin				Mustang Max is a RESTRICTED USE pesticide.
	MUSTANG MAX 0.8E	2.2-4 fl.oz.	0.014-0.025	3	
	Other trade names ²				

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 80S Other trade names ²	1.25 lb.	1	7	
cyfluthrin	BAYTHROID 2	1.6-2.8 fl.oz.	0.025-0.044	7	Baythroid 2 is a RESTRICTED USE pesticide.
gamma-cyhalothrin	PROAXIS	1.9-3.2 fl.oz.	0.0075-0.0125	7 (hay) 1 (forage)	Proaxis is a RESTRICTED USE pesticide.
lambda-cyhalothrin	WARRIOR with ZEON TECHNOLOGY Other trade names ²	1.9-3.2 fl.oz.	0.015-0.025	7 (hay) 1 (forage)	Warrior 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.
True Armyworms, Corn Earworms, Fall Armyworms, Yellow-Striped Armyworms					
<i>Bacillus thuringiensis</i>					
	subsp. <i>aizawai</i> AGREE WG Other trade names ²	0.5-2 lb.	---	0	Use 1.5 to 2 pounds per acre under heavy infestation pressure. Treat to control small armyworms when populations are light and full coverage sprays are applied. For mature worms or heavy populations, a contact insecticide should be used to enhance control.
<i>Bacillus thuringiensis</i>					
	subsp. <i>kurstaki</i> DIPEL DF JAVELIN WG Other trade names ²	1-2 lb. 0.25-1.5	---	0 (1st-2nd instar)	Treat to control small armyworms when populations are light and full coverage sprays are applied. For mature worms or heavy populations, a contact insecticide should be used to enhance control.
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).
cyfluthrin	BAYTHROID 2 Other trade names ²	1.6-2.8 fl.oz.	0.025-0.044	7	Baythroid 2 is a RESTRICTED USE pesticide. Use on small larvae (1st-2nd instar).
gamma-cyhalothrin	PROAXIS	2.6-3.8 fl.oz.	0.01-0.015	7 (hay) 1 (forage)	Proaxis is a RESTRICTED USE pesticide. Use on small larvae (1st-2nd instar).

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
True Armyworms, Corn Earworms, Fall Armyworms, Yellow-Striped Armyworms (cont.)					
inodoxacarb	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	WARRIOR with ZEON TECHNOLOGY Other trade names ²	2.6-3.8 fl.oz.	0.02-0.03	7 (hay) 1 (forage)	Warrior 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.
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.

² See Table 3 for other trade names.

Table 3. Insecticides Labeled for Use on Alfalfa

Insecticide and Trade Name	A.I./ Formulated Product	Formulation	Restricted Entry Interval (hr)	Minimum Days from Last Application to Harvest (h) or Grazing (g)	Maximum Amount per Crop
<i>Bacillus thuringiensis kurstaki</i> strain ABTS-351					
DIPEL DF	54%	dry flowable	4	0	
DIPEL ES	23.7%	emulsifiable suspension	4	0	
<i>Bacillus thuringiensis kurstaki</i> subsp. <i>aizawai</i>					
XENTARI	54%	dry flowable	4	0	
AGREE WG	50%	water dispersable granule	4	0	
<i>Bacillus thuringiensis kurstaki</i>					
JAVELIN WG	85%	water dispersable granule	4	0	
beta-cyfluthrin					
BAYTHROID XL (Restricted Use)	1 lb./gal.	emulsifiable concentrate	12	7	3.2 fl.oz. (0.025 lb. a.i.)/A/ cutting 12.8 fl.oz. (0.1 lb. a.i.)/A/crop season Max. rate beta-cyfluthrin + cyfluthrin = 0.2 lb. a.i./A/season
carbaryl					
SEVIN 4F	4 lb./gal.	liquid suspension	12	7	1.5 qt./A, one application/ cutting
SEVIN XLR PLUS	4 lb./gal.	liquid suspension	12	7	1.5 qt./A, one application/ cutting
CARBARYL 4L	4 lb./gal.	liquid suspension	12	7	1.5 qt./A, one application/ cutting
SEVIN 80S	12.8 oz./lb.	wettable powder	12	7	1.875 lb./A, one application/cutting
CARBARYL 80S	12.8 oz./lb.	wettable powder	12	7	1.875 lb./A, one application/cutting
SEVIN 80WSP	12.8 oz./lb.	water soluble packet	12	7	1.875 lb./A, one application/cutting
carbofuran					
FURADAN 4F (Restricted Use)	4 lb./gal.	liquid suspension	48	7 (0.5 pt./A) 14 (1 pt./A) 28 (2 pt./A)	One application/season

Insecticide and Trade Name	A.I./ Formulated Product	Formulation	Restricted Entry Interval (hr)	Minimum Days from Last Application to Harvest (h) or Grazing (g)	Maximum Amount per Crop
chlorpyrifos					
LORSBAN 4E (Restricted Use)	4 lb./gal.	emulsifiable concentrate	24	7 (0.5 pt./A) 14 (1 pt./A) 21 (>1 pt./A)	Four applications/season, 1 lb. a.i. max. rate/application, 10 days between applications
CHLORPYRIFOS 4E AG (Restricted Use)	4 lb./gal.	emulsifiable concentrate	24	Same as above	Same as above
NUFOS 4E (Restricted Use)	4 lb./gal.	emulsifiable concentrate	24	Same as above	Same as above
WARHAWK (Restricted Use)	4 lb./gal.	emulsifiable concentrate	24	Same as above	Same as above
WHIRLWIND (Restricted Use)	4 lb./gal.	emulsifiable concentrate	24	Same as above	Same as above
LOCK-ON (Restricted Use)	2 lb./gal.	emulsifiable concentrate	24	4 (1.5-2 pt./A)	Same as above
LORSBAN 75WG	12 oz./lb.	water dispersable granule	24	7 (0.33 lb./A) 14 (0.67 lb./A) 21 (>0.67 lb./A)	Same as above
YUMA (Restricted Use)	4 lb./gal.	emulsifiable concentrate	24	Same as above	Same as above
LORSBAN 15G	2.4 oz./lb.	granular	24	21	1 lb. a.i./yr.
cyfluthrin					
BAYTHROID 2 (Restricted Use)	2 lb./gal.	emulsifiable concentrate	12	7	3.2 fl.oz. (0.05 lb.a.i.) /A/cutting 12.8 fl.oz. (0.2 lb. a.i.)/A/season Max. rate cyfluthrin + beta-cyfluthrin = 0.2 lb. a.i./A/season
RENOUNCE 20WP (Restricted Use)	3.2 oz./lb.	wettable powder	12	7	4 oz./A/ cutting 16 oz./A/year Max. rate cyfluthrin + beta-cyfluthrin = 0.2 lb. a.i./A/season
TOMBSTONE (Restricted Use)	2 lb./gal.	emulsifiable concentrate	12	7	3.2 fl.oz./A/cutting 12.8 fl.oz./A/year Max. rate cyfluthrin + beta-cyfluthrin = 0.2 lb. a.i./A/season

Insecticide and Trade Name	A.I./ Formulated Product	Formulation	Restricted Entry Interval (hr)	Minimum Days from Last Application to Harvest (h) or Grazing (g)	Maximum Amount per Crop
dimethoate					
DIMETHOATE 4E	4 lb./gal.	emulsifiable concentrate	48	10	One application per cutting
5 LB. DIMETHOATE	5 lb./gal.	emulsifiable concentrate	48	10	Same as above
DIMETHOATE 2.67	2.67 lb./gal.	emulsifiable concentrate	48	10	Same as above
DIMETHOATE WS	4 lb./gal.	liquid	48	10	Same as above
DIMATE 4E	4 lb./gal.	emulsifiable concentrate	48	10	Same as above
gamma-cyhalothrin					
PROAXIS (Restricted Use)	0.5 lb./gal.	microencapsulated suspension	24	7 (h), 1 (g)	0.24 pt./A/cutting 0.72 pt./A/season Max. rate gamma-cyhalothrin + lambda-cyhalothrin = 0.12 lb. a.i./A/season
indoxacarb					
DUPONT STEWARD	1.25 lb./gal.	suspension concentrate	12	7	11.3 fl.oz./A/cutting; one application per cutting
STEWARD EC	1.25 lb./gal.	emulsifiable concentrate	12	7	45 fl.oz./A/season
lambda-cyhalothrin					
WARRIOR with ZEON TECHNOLOGY (Restricted Use)	1 lb./gal.	capsule suspension	24	7 (h), 1 (g)	0.24 pt./A/cutting 0.96 pt./A/season Max. rate lambda-cyhalothrin + gamma-cyhalothrin = 0.12 lb. a.i./A/season
LAMBDA-T (Restricted Use)	1 lb./gal.	capsule suspension	24	7 (h), 1 (g)	Same as above
SILENCER (Restricted Use)	1 lb./gal.	emulsifiable concentrate	24	7 (h), 1 (g)	Same as above
TAIGA Z (Restricted Use)	1 lb./gal.	capsule suspension	24	7 (h), 1 (g)	Same as above
malathion					
MALATHION 5	5 lb./gal.	emulsifiable concentrate	12	0	
MALATHION 8	8 lb./gal.	emulsifiable concentrate	12	0	
MALATHION ULV	9.8 lb./gal.	ULV concentrate	12	0 (8 fl.oz./A) 5 (≥12 fl.oz./A)	
FYFANON	5 lb./gal.	emulsifiable concentrate	12	0	
FYFANON ULV (AG)	9.9 lb./gal.	ULV concentrate	12	0 (8 fl.oz./A) 5 (≥12 fl.oz./A)	

Insecticide and Trade Name	A.I./ Formulated Product	Formulation	Restricted Entry Interval (hr)	Minimum Days from Last Application to Harvest (h) or Grazing (g)	Maximum Amount per Crop
methomyl					
LANNATE LV (Restricted Use)	2.4 lb./gal.	water soluble liquid	48	7	12 pt./A/crop, up to 10 applications per crop
LANNATE SP (Restricted Use)	14.4 oz./lb.	water soluble powder	48	7	4.4 lb./A/crop, up to 10 applications per crop
permethrin					
POUNCE 25 WP (Restricted Use)	4 oz./lb.	wettable powder	12	0 (6.4 fl.oz./A) 14 (>6.4 fl.oz./A)	0.8 lb./A/cutting
PERMETHRIN 3.2 (Restricted Use)	3.2 lb./gal.	emulsifiable concentrate	12	Same as above	0.8 fl.oz./A/cutting
POUNCE WSB (Restricted Use)	4 oz./lb.	water soluble bag	12	Same as above	0.8 lb./A/cutting
PERM-UP 3.2EC (Restricted Use)	3.2 lb./gal.	emulsifiable concentrate	12	Same as above	0.8 fl.oz./A/cutting
PERM-UP 25 WP (Restricted Use)	4 oz./lb.	wettable powder	12	Same as above	0.8 lb./A/cutting
ARCTIC 3.2EC (Restricted Use)	3.2 lb./gal.	emulsifiable concentrate	12	Same as above	0.8 fl.oz./A/cutting
s-methoprene					
	0.08 oz./lb. (0.5%)	fire ant bait	4	0	
zeta-cypermethrin					
MUSTANG MAX (Restricted Use)	0.8 lb./gal.	liquid	12	3	4 fl.oz./A/cutting 12 fl.oz./A/season, 7 days between applications
RESPECT (Restricted Use)	0.8 lb./gal.	liquid	12	3	

Table 4. Properties of Insecticides Used on Alfalfa That May Affect Water Quality

Common Name	Surface-Loss Potential ¹	Leaching Potential ²
<i>Bacillus thuringiensis</i>		
subsp. <i>kurstaki</i>	Small	Small
subsp. <i>aizawai</i>	Small	Small
beta-cyfluthrin	Large	Small
carbaryl	Medium	Small
carbofuran	Small	Large
chlorpyrifos	Medium	Small
cyfluthrin	Small	Small
dimethoate	Small	Medium
gamma-cyhalothrin	Large	Small
indoxacarb	Small	Small
lambda-cyhalothrin	Large	Small
malathion	Small	Small
methomyl	Small	Medium
permethrin	Large	Small
zeta-cypermethrin	Large	Small

¹ The surface-loss potential indicates the tendency of the pesticide to move with sediment in runoff.

² The leaching potential indicates the tendency of a pesticide to move in solution with water and to leach below the root zone.

NOTE: Differences in formulations, application mode (e.g., bare ground versus crop canopy), and soil type will affect how these ratings are used. Read manufacturer's label carefully for specific information for all product use restrictions and safety.

SOURCE: Ratings are based primarily on information obtained from USDA-ARS Interim Pesticide Database, Version 1.0, by R.D. Wauchope, August 5, 1988.

WEED CONTROL

Table 5. 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 (1-3 qt.)	2,4-DB (0.5-1.5 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 (1.5-2.25 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).

Herbicide Trade Name (Rate/Acre Broadcast)	Herbicide Common Name (Active Herbicide/Acre)	Comments
Postemergence (Seedling Alfalfa) (cont.)		
PURSUIT 70DG (1.08-2.16 oz.) or PURSUIT 2EC (3-6 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 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.
SELECT 2EC (6-8 fl.oz.) + Crop Oil Concentrate (1 qt.)	clethodim (0.09-0.125 lb.) + crop oil concentrate	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 to spray mix.
Preemergence (Established Alfalfa)		
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.
Postemergence (Established Alfalfa)		
BUTYRAC 200 (2-3 qt.)	2,4-DB (1-1.5 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 (0.7 pt.) or GRAMOXONE INTEON (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. Kerb is a RESTRICTED USE pesticide.

Herbicide Trade Name (Rate/Acre Broadcast)	Herbicide Common Name (Active Herbicide/Acre)	Comments
Postemergence (Established Alfalfa) (cont.)		
POAST 1.5 (1-1.5 pt.) or POAST PLUS (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 70DG (1.08-2.16 oz.) or 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 (0.047-0.063 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.
SELECT 2EC (10 fl.oz.) + Crop Oil Concentrate (1 qt.)	clethodim (0.16 lb.) + crop oil concentrate	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.
SENCOR 4L (1 pt.) or SENCOR 75DF (0.67 lb.)	metribuzin (0.5 lb.)	Controls small winter weeds and provides preemergence control of small-seeded grass and broadleaf weeds. Apply in fall after plants are FULLY DORMANT . DO NOT graze within 28 days after application. In alfalfa-grass mixtures, will provide partial reduction of forage grass stands. DO NOT use on sand or on soils with less than 0.5 percent organic matter. DO NOT apply within 12 months after seeding.

Table 6. Properties of Herbicides Used on Alfalfa That May Affect Water Quality ¹

	HERBICIDES							
	Balan	Butyrac	Eptam	Gramoxone	Kerb	Poast, Select	Pursuit	Sencor
Surface-Loss Potential²	M	S	M	S	L	S	---	M
Leaching Potential³	S	M	M	S	S	S	---	M

¹ Leaching and surface-loss potential ratings are based in part on herbicide chemical characteristics and pesticide behavior models developed by USDA scientists as well as on field experience.

² The surface-loss potential indicates the tendency of the pesticide to move with sediment in runoff.

³ The leaching potential indicates the tendency of the pesticide to move in solution with water and to leach below the root zone.

KEY TO RATINGS: S = Small; M = Medium; L = Large.

2008IPM-978

For more information, call your county Extension office. It is listed in your telephone directory under your county's name.

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 cancelled, the rate listed here is no longer recommended. Before you apply **any** pesticide, check with your county Extension agent for the latest information.

Trade names are used **only** to give specific information. The Alabama Cooperative Extension System does not endorse or guarantee any product and does not recommend one product instead of another that might be similar.

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