

TIMING FOR SEASON LONG CONTROL

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Abstract: Season long weed control is imperative to producing high quality profitable alfalfa hay. Weed management begins with properly planting and growing a vigorous alfalfa stand that is competitive with weeds. Planting dates, cutting intervals and irrigation schedules all have an impact on weed invasions and populations. Timing herbicide applications when weed seedlings are small and the alfalfa mature enough to prevent injury is important to effective control. Winter annual broadleaf weeds are best controlled when seedlings have 2 to 3 true leaves. Alfalfa should have at least 2 to 4 trifoliate leaves before postemergent herbicides are used. Summer grasses can be controlled preemergence with either Genep or Treflan if applied before grass emergence. Poast provides effective control when applied to grass plants no more than 6 inches tall that are actively growing. Treflan also controls the parasitic weed, dodder, if applied before emergence.

Keywords: Weed control, planting, cutting intervals, irrigation, timing, seedling alfalfa, established alfalfa, winter annuals, grasses, dodder.

INTRODUCTION

Weeds growing in alfalfa can seriously reduce yields or cause loss of the stand. Winter annual weeds can compete with alfalfa to such an extent that the first cutting is useless and in the case of seedling stands, entire stand loss can occur. Even light infestations can weaken young alfalfa plants, retard growth, and delay the first cutting. Weeds reduce yields of alfalfa through competition for water, nutrients and sunlight and they lower or reduce the quality and retail value of alfalfa hay because they are less palatable and less nutritious than alfalfa. Research on alfalfa grown for hay indicates that first cutting hay yields are often highest when winter annual weeds are present. However, the quality of the hay is reduced drastically. Protein as low as 9% has been measured in hay containing 80% weeds. Weeds such as fiddleneck and common groundsel are toxic while yellow foxtail cause mechanical injury, both rendering hay unfit for livestock consumption.

Season long weed control begins with properly establishing and managing an alfalfa stand. Alfalfa that germinates and grows rapidly due to warm temperatures, adequate soil moisture, and shallow planting will develop into a competitive and relatively weed free stand. Adequate soil fertility is also essential in establishing a vigorous stand.

Alfalfa varieties respond to different climates and soils and should be chosen with care. Insects should be controlled to maintain stand vigor. Pre-irrigation will germinate many weed seeds which can then be removed by final seedbed cultivations.

CULTURAL PRACTICES

Timing for effective season long weed control begins with time of planting. Fields seeded in late summer can be seriously infested by late germinating summer weeds. Alfalfa planted in the winter months will grow slowly, allowing winter annual weeds such as fiddleneck and weeds in the mustard family to become well established before the alfalfa can be safely sprayed with postemergence herbicides.

Spring planting can reduce problems with winter annual weeds by allowing the growers to remove weed seedlings that have germinated prior to seedbed preparation. Although, abundant moisture and favorable temperature in the spring can cause large numbers of weed seeds to germinate. Planting too late in the spring can also allow summer grasses to become established in seedling alfalfa. To minimize weed problems and establish alfalfa under favorable growing conditions it is recommended Central Valley alfalfa be planted between September 15 to October 31 in the fall and between January 15 to March 15 in the spring.

The frequency or timing of the cutting intervals has a profound impact on weed problems. Short cutting intervals (i.e. every 20 to 28 days in the summer) does not give the alfalfa plants enough time to build up sufficient stored food in the roots to initiate

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the most vigorous regrowth after cutting, giving weeds a competitive advantage. Forty eight to 55 percent weed infestations have been noted with 21 to 25 day cutting intervals as opposed to a 8 percent weed infestation with 29 to 30 day cutting intervals.

Leaving cut hay in windrows when there is a high weevil population for more than a few days can lead to weed problems. Feeding by the weevil larvae concentrated under the windrows severely stunts alfalfa regrowth giving a competitive edge to seedling weeds.

The first cutting of a fall-planted seedling field should be delayed at least 2 to 3 weeks past the normal cutting date for established hay. Also, the interval between the first and second cutting of a new stand should also be about 2 weeks longer than normal. This allows root reserves to build up, keeping the alfalfa vigorous.

Irrigation scheduling and timing can also have an effect on weed invasion. Over-irrigating can lead to disease problems, creating areas of little or no alfalfa growth where weeds easily become established. Fields should be irrigated as close to cutting as practical, which encourages more rapid regrowth of alfalfa and decreases competition from weeds. If summer grasses are present irrigating before the newly cut alfalfa has grown enough to shade the soil surface can favor summer grasses by providing enough water and sunlight to promote growth. Delaying irrigation under these conditions have been shown to reduce summer grass problems. However, irrigation scheduling must be timed with harvest schedules. Bringing in harvesting equipment to soon after an irrigation may cause soil compaction and effect alfalfa growth, promoting weed growth.

HERBICIDES

Herbicides are an integral part of an integrated weed management program in alfalfa. Many factors determine the success or failure of an herbicide. Timing of herbicide applications in relationship to both the weed and alfalfa growth is an extremely important consideration when using herbicides.

Winter annual weeds can compete with seedling alfalfa to such an extent that the first cutting is useless or entire stand loss can occur. Timing is the key to the effective control of winter annual weeds with the postemergence herbicides 2,4-DB and paraquat. Applications need to be made when the weeds are young seedlings, having only 2 to 3 true leaves. When seedlings grow beyond the rosette stage control become erratic and unsuccessful. But, because the postemergence herbicides can only be used on seedling alfalfa with a minimum of 2 to 4 trifoliolate leaves ideal timing of herbicide application for effective control may not be possible. Many times winter annual weeds such as fiddleneck will be beyond the rosette stage before the alfalfa is mature enough to be safely treated. 2,4-DB should be applied after alfalfa plants have 2 to 4 leaves. Sensitive broadleaf weeds will be controlled if they are under 1 to 3 inches tall or their rosettes are less than 3 inches in diameter. Paraquat can be applied to seedling alfalfa that has 3 to 9 trifoliolate leaves. Rates will depend on the maturity of the alfalfa seedlings. Weed seedlings should have only 2 to 3 true leaves or control becomes erratic. Again, often weeds are beyond the stage for effective control before the alfalfa is mature enough to be treated.

A study conducted by Steve Orloff, Farm Advisor in Los Angeles and San Bernardino Counties indicates the importance of proper timing of herbicide application in seedling alfalfa (Table 1). Best weed control was achieved when the herbicides were applied early when the weeds only had 4 to 6 leaves. 2,4-DB ester was effective on all weeds except common groundsel. Pursuit, not yet registered on alfalfa, was effective even at the low rate. Brominal also gave excellent control. In general, alfalfa injury was greater with the early treatments when the alfalfa plants were in the 2 to 3 trifoliolate leaf stage.

Winter annual broadleaves and summer annual grass such as yellow foxtail are serious problems in established alfalfa stands.

Soil active herbicides for use in established alfalfa should be applied in fall or winter after alfalfa becomes dormant, or in the spring before new growth begins and before weeds become established. Using soil active herbicides on alfalfa that has resumed growth can cause yellowing of foliage and delay the first cutting. Applications of soil active herbicides must also be timed so they are incorporated by winter rainfall or sprinkler irrigations.

Timing is critical to effective season long control of summer grasses in established alfalfa. Genep (EPTC) applied in the irrigation water can provide acceptable control only if applied before grass germination. EPTC should be applied in mid-February in the Central Valley. One application controls grasses for 45 to 60 days so 2 to 3 applications are required for season long control.

Poast (sethoxydim) a post emergence grass herbicide selectively controls foxtail, barnyardgrass, cupgrass and other annual grasses. Poast should be applied after the bales are removed from the field but before alfalfa regrowth can interfere with spray coverage. Early application, before the grass exceeds 6" tall, has proved most effective. Because Poast gives poor control of drought stressed grasses, application should be followed by an irrigation.

Treflan TR-10 (trifluralin) provides effective control of summer grasses in established hay. Treflan should be applied in winter or early spring before grasses germinate. A study conducted by Jack Orr, Farm Advisor in Sacramento County, indicated Treflan TR-10 applied in December gave the most consistent season long foxtail control, ranging from 86% in April to 80% in October. January applications resulted in 79% control in June to 64% in October. A February application gave 90% control in June and 75% in October. This study clearly indicates that applications should be made mid-December to mid-January for effective season long control of foxtail.

Dodder, a parasitic weed can be a serious problem in alfalfa hay. Alfalfa parasitized by dodder grows less vigorously and is often weakened to the extent that the plant dies. Again, timing is the key to effective control.

Treflan TR-10 granules, applied to established alfalfa, effectively control dodder. Studies indicate the herbicide must be applied before dodder emerges (March in the Central Valley) for adequate control. Studies have indicated 90 to 95 percent control when applied in March, previous to emergence, as opposed to 10 to 15% control when applied after the first cutting.

Effective weed management can be achieved in both seedling and established alfalfa. Many factors are involved, but timing of both cultural practices and herbicide applications are critical to successful season long control.

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TABLE 1 - The Effect of Treatment Timing on Weed Control in Seedling Alfalfa

Treatment Dates:		11/19/87		12/21/87	
		# leaves	inches	# leaves	inches
Alfalfa		2-3		4-6	
Shepherd's purse		5	1.5-2"	8-10	3-4"
London rocket		4-6	.5-3"	3-5"	3-5"
Groundsel		4-5	2" diam .75" tall	6-8	3" diam 1" tall

Timing/ Herbicide	Rate ai/A	Weed Control ^{1/}			
		London Rocket 1/14	Groundsel 1/14	Shepherd's Purse 1/14	Alfalfa Injury 1/14
EARLY					
2,4-DB ester	.5	10.0	1.5	5.3	0.6
2,4-DB ester	.75	10.0	3.3	6.8	0.9
Brominal	.25	9.8	9.3	7.8	0.9
Brominal	.50	10.0	10.0	9.3	1.0
Pursuit ^{2/}	.063	9.8	6.3	7.8	1.4
Pursuit	.94	10.0	9.8	8.5	1.1
Pursuit	.125	10.0	10.0	9.4	1.1
Pursuit + Brominal	.063 .25	10.0	9.0	9.5	1.9
LATE					
2,4-DB ester	.5	4.8	0.5	3.0	0.6
2,4-DB ester	.75	5.3	0.3	3.3	0.4
Brominal	.25	5.0	7.3	4.3	0.4
Brominal	.5	9.3	9.0	7.0	0.5
Pursuit	.063	5.0	1.0	2.3	0.6
Pursuit	.94	7.3	2.8	4.3	0.6
Pursuit	.125	7.8	3.3	4.8	0.5
Pursuit + Brominal	.063 .25	8.0	7.3	6.0	0.5
Check		0.0	0.0	0.0	0.1

^{1/} Weed Control 0 = no control 10 = 100% weed control
^{2/} 25% X-77 added

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