TIMING IS EVERYTHING
WHAT MAKES YOU MONEY IN ALFALFA WEED CONTROL

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INTRODUCTION

Controlling weeds is necessary in alfalfa production to extend the stand life and produce high quality hay. Weeds rob alfalfa of water, nutrients, and light. They retard growth, impede root development, lower the quality, and reduce the alfalfa yield. Weed free alfalfa improves harvest efficiency by speeding the drying time, and expands marketing opportunities and commands higher prices. The presence of poisonous weeds: common groundsel *Senecio vulgarius*, coast fiddleneck *Amsinckia intermedia* and poison hemlock *Conium maculatum* to name a few further reduce hay value or make it completely unmarketable. The economic return to produce weed free alfalfa can offset the extra management practices or the use of herbicide.

Controlling weeds begins in the planning stages of alfalfa. Weeds take advantage of opportunities due to unfavorable growing conditions. Of the major pest problems today, weeds can be the most challenging and require a total integrated approach to be successful. Therefore, the importance of crop rotations, laser-leveled fields for precise irrigation and water drainage, applications of soil amendments and fertilizers to promote vigorous growth adds to a successful weed management program. Selecting varieties with multiple pest resistance will promote a healthier plant to compete against weeds.

WEED CONTROL PRACTICES

Cultural Practices can reduce weed problems. Generally, one single approach is not sufficient for weed control; rather a combined cultural and chemical approach of crop rotations will be most successful. Land leveling, adequate fertility levels and a good seedbed are also important steps to achieve a healthy population of alfalfa, which directly affects its ability to compete against weeds.

Crop rotation can be effective for reducing weed populations before planting alfalfa. Many weeds are better controlled in the preceding crop than in alfalfa. For example, many winter weeds can be controlled in a wheat or oat crop with a phenoxy herbicide or summer weeds controlled by growing corn and using selective herbicides and cultivations.

Preirrigation can further reduce weed populations so alfalfa will have less impact from weeds. Not only does a preirrigation help for weed control but will fill the soil profile with moisture necessary for deep rooted crops.

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Fallowing the ground or keeping vacant the land, the season before alfalfa is planted can also minimize the development and spread of weeds. This practice also reduces soil pathogens that favor a high moisture environment and are problems in alfalfa. For example, Pythium, phytophthora and rhizoctonia are fungi that feed on alfalfa roots, reduce plant vigor allowing opportunities for weeds to take hold.

TIME OF PLANTING

Warm soils favor rapid germination and growth of alfalfa. The optimum soil temperatures for alfalfa germination ranges from 69º to 76º F. When alfalfa is planted under these conditions, it will grow faster and be more competitive with weeds. Therefore planting at a time when favorable temperatures exist and before the time of peak weed germination, will allow alfalfa to stay ahead of weeds. Avoid planting alfalfa when temperatures are unfavorable for good growth, (<50º or >90º F) since this allows weeds to flourish over the slower growing alfalfa. Herbicides also perform better when applied to weeds vigorously growing and are less injurious to the alfalfa. Identifying site-specific weed areas at least one year in advance will help with time of planting decisions and the herbicides that should be used.

For example: The time of seeding in November or December in the San Joaquin Valley and relying on rainfall for germination was the standard practice. The problem with this method is twofold: alfalfa grows slow in cold temperatures and needed rainfall for moisture for germination is unpredictable. This can result in a variable stand, different size alfalfa, with a non-uniform population. Colder temperatures favor winter weeds especially mustards, shepherds purse, chickweed, fiddleneck and certain grasses that compete with the slower growing alfalfa seedlings. The longer it takes alfalfa to germinate the greater chance of variable plant sizes, which can delay a timely herbicide application. Delaying treatment only result in larger weeds and unsatisfactory results. Most post emergence herbicides are limited to a growth stage or size of alfalfa large enough to avoid crop injury.

An alternative planting time for the San Joaquin Valley is between September and October. By this time, summer weeds have finished their growth cycle and are generally not as serious a problem. Fall temperatures are also more favorable for alfalfa growth to get a head start on the winter weeds that germinate later. Usually winter weeds reach peak germination and growth in December, by then the alfalfa is already well established.

Early seeding can also be used for spring plantings to avoid summer weed problems of nutsedge, bermudagrass, foxtail and barnyardgrass. Alfalfa Planted in February through March will germinate before the peak of summer weed growth begins. When considering a spring planting, it is advisable to get a head start by preparing the seedbed and forming the irrigation borders the previous fall. This is an advantage to working wet soil and to avoid compaction problems in the spring. Weeds that grow during the winter can be easily controlled with glyphosate or paraquat herbicide so only minimal tillage of the seedbed is needed prior to seeding.

TIMING HERBICIDE APPLICATIONS

Weed size and species

Small weeds are easier to control and have less impact on the developing crop. Generally, it takes less herbicide (active ingredient per acre) to control a smaller immature weed than a weed that is older, larger, and has "hardened " from the harsh environment. Young tender tissue allows herbicides to penetrate more effectively. Immature weeds also have a smaller root system that is less apt to recover from an herbicide application. Whichever herbicide is selected one principal that is shared is weed size. The smaller or less mature the weed the better the control.

Treating smaller weeds is cost effective because:

1. *Smaller weeds are controlled easier using. lower herbicide rates.*
2. *Allows the use of lower spray volumes that require less fill ups and cover more acres per tank load.*
3 *Competition from small weeds is minimal and does not impact long-term yield.*

Dozens of different weeds can occupy alfalfa at all times of the year. Most weeds are annuals but perennials and biennials can also be a serious problem. Some are parasitic and only survive on alfalfa as a host. There are poisonous weeds toxic to animals, and aromatic weeds that animals will not eat or may contribute off flavors to the milk.

Identifying the weed and understanding the biology is important in selecting the correct control measure. For example; Curly dock is a biennial or can act as a perennial depending on the environment. The most effective control is using a systemic herbicide, which is able to move into the root system. To accomplish this treating in the fall when carbohydrates are moving downward is more effective than springtime when flow is upwards. When broad leaf plantain is a problem, evaluate the irrigation schedule used. This weed flourishes under moist soil conditions. If all else fails, using a herbicides in the fall that translocate will kill existing plants.

Yellow or green foxtail *(Setaria)* is arguably the worst summer weed problem in alfalfa. It has adapted to the multiple harvest intervals of alfalfa and produces viable seeds within a cutting cycle. This insures its continuation for the following year. The vegetative growth is prostate and missed by the swather. The best approach to control foxtail grasses can be handled in several different ways. Extending the harvest intervals will promote a stronger alfalfa plant better able to compete against developing populations. Although this practice may compromise hay quality it is an option. Delaying irrigation until alfalfa regrowth is 6 to 10 inches tall and has shaded the soil surface will also inhibit weed germination.

In addition to using cultural practices to manage foxtail, the need for herbicides is necessary. Timing the herbicide application to a small immature weeds size has been discussed. Another important timing of herbicide application is the physiological state or condition of a weed to the environment in which it exists.

This point was well defined in a study conducted in 2001 where herbicide timings were compared on foxtail sp at different soil moisture levels. The experiment was set up following the third harvest of alfalfa in June at a time when foxtail grass becomes noticeable and is beginning to form seed heads. The first timing of treatments was applied immediately following bale

removal when alfalfa stubble was short and weeds were exposed for excellent spray coverage. The soil conditions were very dry with little growth of weeds or alfalfa. The second timing was made using the same herbicides applied three days following irrigation. (Approximately a week after the first treatment) The alfalfa and weeds were responding to the moisture of the irrigation and had grown 6 to 8 inches. Evaluations for weed control were made several times the next two months. The results were amazing and showed as much as 50% decrease in foxtail control from the herbicides sprayed under dry conditions. (Table 1, figure 1.)

It was clear from this experiment that the effectiveness of systemic type herbicides (Poast, Prism Pursuit and Raptor) are greatly reduced when applications are made to weeds in moisture stressed condition. Weeds are a continuous threat in alfalfa from the seedling stage through the final year of the stand. The strategies of weed management may change annually but one thing is certain; the grower will face some weed decision each year. The right choice will depend on many factors, some which include weed species, health of the stand, years remaining and the hay market prices. Whatever the decision, using the combination of good cultural practices with early herbicide treatments in high moisture conditions with vigorously growing plants, is certain to pay off in the end.

Herbicide timing for control of Yellow Foxtail in Alfalfa

Table 1.

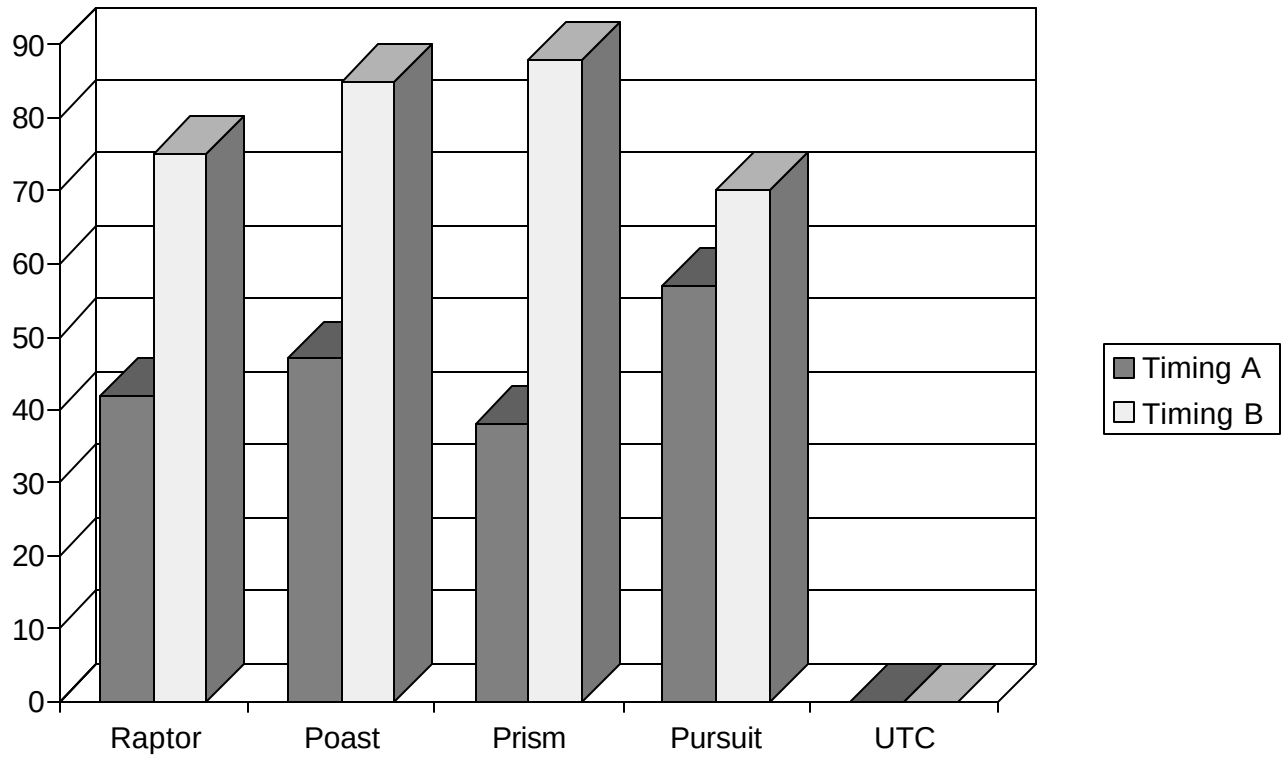
		Rating July 01	*August 01*
Plot	**Herbicide and Rate**	*** % Foxtail Control**	*** % Foxtail Control**
1A	Raptor .032	42	43
1B	**Raptor .032**	**75**	**61**
2A	Raptor .040	57	47
2B	**Raptor .040**	**79**	**72**
3A	Raptor .047	55	30
3B	**Raptor .047**	**78**	**72**
4A	Poast .30	47	30
4B	**Poast .30**	**85**	**73**
5A	Prism .10	38	28
5B	**Prism .10**	**88**	**72**
6A	Poast + Raptor .30 + .032	52	30
6B	**Poast + Raptor .30 + .032**	**81**	**62**
7A	Poast + Raptor .30 + .040	72	33
7B	**Poast + Raptor .30 + .040**	**88**	**83**
8A	Poast + Raptor .30 + .047	60	43
8B	**Poast + Raptor .30 + .047**	**70**	**53**
9A	Poast + Prowl .30 + 2.0	75	82
9B	**Poast + Prowl .30 + 2.0**	**95**	**98**
10A	UTC	0	0
11A	Pursuit .094	57	37
11B	**Pursuit .094**	**70**	**63**

*Distribution: * 80% yellow foxtail; 20% green foxtail* A= Treated before irrigation 05/29/01

B= Treated 3 days following irrigation 06/07/01

Herbicide timing for control of Yellow Foxtail in Alfalfa

Figure 1.



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