

SOME THOUGHTS ON THE
ECONOMICS OF WEED CONTROL IN ALFALFA
FOR LOW DESERT AREAS OF ARIZONA

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The number of weed control variables involved with alfalfa hay production makes it impossible to measure all economic factors. Some of the factors which affect economic weed control in alfalfa are:

Land Preparation	Weed-free Seed
Planting Time	Predictability of Weed Species
Planting Method	Weed Species Present
Variety Selection	Cosmetic
Fertilizer Program	Timing of Cuttings
Financier	Number of Cuttings
Maintaining a Stand	Rotational Plan
Number of Irrigations	Incidence of Disease
Quality of Irrigation Water	Packaging of Hay
Type of Irrigation	Percent of Weeds in Baled Hay
Irrigation Water Source	Demand & Supply for Hay
Irrigation Management	Price Incentive for Quality Hay
Pesticide Salesmen	Ultimate Market of Hay
Types of Herbicides Available	Time
Insect Control	Weather

Some attention has been given to this problem by various people, myself included, but none to my knowledge have satisfactorily answered this problem. Lack of resources and the large number of variables probably will limit the number of answers to this situation. Nevertheless, many alfalfa weed control programs are at work today and most have some economic advantage or they would not be continued.

Economic advantages of weed control in alfalfa can occur either in the field or in the finished hay product. The economics in the field include such items as competition by weeds and loss of stand. During the stand establishment period, many factors can economically affect an alfalfa stand. For instance, planting too early can lead to summer weed competition. Preparation of land, such as poor land leveling, can cause severe ponding and stand loss. Because of the high cost of establishing a stand, estimated at \$170 per acre in 1970, economics dictate doing things right during stand establishment. Knowing the weed history of your land should serve as a guideline for determining the economics of applying a pre-plant herbicide. When a field has a history of severe weed pressure, a herbicide would probably be a good investment. When a field has had no history of weed problems and good land preparation has been used and planting is accomplished at the right time, pre-plant herbicides probably will not be economically justified. Furthermore, if weed problems do occur, several post-emergence herbicides will control weeds. 2,4-DB and protham provide economic return when applied properly. In some cases these products can be justified to protect a stand and can also improve quality of harvested hay. Stand establishment is probably the time when weed control can be justified most easily. This is particularly true when both improved stand and improved quality are accomplished. The economics of weed control after stand establishment becomes a more complicated question. Most factors listed have more effect during this period. As the number of practices performed on established alfalfa fields multiplies, measuring of economic weed control becomes more complex. For example, by the time an alfalfa stand is one year old it has been irrigated 15 to 20 times. If a slight stress occurs before each irrigation, a cumulative effect could cause stand loss and allow weeds to become established.

There are times when alfalfa stands are most vulnerable to the invasion of weeds. Timing weed control practices during these periods provides economic weed control. Some of these are obvious, such as applying water run EPTC during the first irrigation after a cutting, rather than the second irrigation. More important, however, may be the time of year to use water run EPTC. EPTC is not effective on dormant seed of summer annual grasses. Use of this material will then be most economic as summer annual grasses germinate. This can occur from February through October, but probably is most important after cuttings in April, May, June, July and August. On heavier soils, which are difficult to irrigate in

summer because of "summer die out", EPTC applications may be wasted. This is particularly true when "summer die out" will ultimately dictate renovation and reseeding during late summer and early fall. Sandy soils, on the other hand, which can be irrigated during summer can benefit from EPTC water run applications during summer. Proper management of established alfalfa stands is very important from an economic weed control standpoint, because of limited number of herbicides available to control weeds, particularly established weeds.

Another important economic weed control factor is the crop which follows the alfalfa. As an example, nutsedge may be controlled in alfalfa with the repeated use of EPTC. Other crops, such as vegetables, may then be grown again.

The economic effects of weed control on forage production is no easier to measure than the preceding factors. Quantity of hay produced is a definite economic consideration even when quality is not considered. Weeds can add to the yield of hay harvested. Weeds can also add to swathing, curing and packaging problems. Large stem weeds can delay curing so long that alfalfa leaves shatter. Irrigation may have to be delayed so that stress occurs. Cubing alfalfa becomes difficult when grass weeds are numerous. Seldom is quantity of forage increased by weed control, but quality can be affected.

People other than growers become involved in quality factors. Hay buyers and brokers stress quality factors when they purchase hay. Weed control is not the only quality factor, but weeds can reduce value of hay, according to brokers, by \$3 to \$20 per ton. A \$3 discount would indicate hay with only a small amount of weeds which are non-objectionable. Less than 10% grass in good green hay would be an example. Weed content in excess of 10% can, on the other hand, cause hay to be unsuitable for dairies, and will usually be discounted more than \$3 per ton. Content of poisonous weeds, such as datura, renders hay almost useless and results in severe discounts.

Supply and demand situations usually affect discounts for weedy hay. When supply is short and prices high, buyers usually will overlook a few weeds. In an over-supply of hay with low prices weedy hay is more severely discounted. Weed content often is not the primary quality factor. The time of year usually has more to do with alfalfa prices in Yuma than weed content. During summer it is difficult to package a good green hay product because of leaf shatter and bleach in the windrow. Lack of night and morning dew moisture also makes quality haymaking more difficult during this period. It would appear that the economics of weed control in alfalfa would be best when prices are lowest.

Segregation of alfalfa bales may help a grower obtain a better price for his hay. Bales where weeds are predominate could be stacked separately from better quality hay. At least, bale stacks of weedy hay should not be intermixed with weed-free hay stacks. Quality hay, including freedom from weeds, probably is economically justified in the long run for a grower, since he can probably build a reputation with brokers and buyers for having quality hay. All of the above observations are subjective, or opinions, since little objective research data is available on which to base ones conclusions. Ultimately protein, digestible protein or total digestible nutrient type analysis will be used to quantify these questions. Quick tests and some type of automatic bale sampling could go a long way in solving hay price disputes. A grading system, if used, could also help. Most buyers and brokers at this time would agree that weed control in alfalfa is important, and will usually pay a premium for weed-free hay, however, this premium may not be sufficient to pay the grower for the cost of weed control.

When all factors are considered, using good growing practices can reduce weed problems in alfalfa, sometimes economically. Tools such as herbicides, irrigation management, cutting management and planting at the right time are factors which can help go a long way in economic weed control in alfalfa.