ECONOMIC BENEFITS OF WEED CONTROL IN ALFALFA

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The current economic condition of agriculture forces growers to closely evaluate every field practice to be certain of its profitability. If the practice does not return a net profit, the grower is likely to forgo the practice. Since prices of top quality, weed-free alfalfa are not as high as the grower feels is warranted, the advisability of chemical weed control practices could be questioned. The intent of this article is to examine the profitability of chemical weed control in alfalfa given the current value of alfalfa hay and the cost of commonly used weed control practices.

The value of alfalfa hay depends upon its quality. The factors that determine the quality designations include: TDN, protein, color, stem quality, leaf attachment, and the presence or absence of weeds. While "weediness" is not the sole criteria for determining the hay quality designation, it can be the major one. For example, alfalfa can not be designated "premium" quality if it contains any noxious weeds. It is difficult to even sell hay if it is fifty percent grass! Figures 1,2 and 3 illustrate alfalfa hay prices in the Imperial Valley, Western Fresno-Madera Counties, and Sacramento districts for three alfalfa grades in 1985, 1986, and 1987. On farm hay prices were higher in Fresno and Sacramento than in the Imperial Valley District. Average yearly prices for premium quality hay ranged from $28 to $15 higher in price than fair quality. The largest difference occurred in the Fresno and Sacramento Districts.

Weed control in alfalfa can be divided into three categories, seedling weed control, winter weed control in established alfalfa, and summer annual grass control. Commonly used herbicide programs have been selected for specific cost comparisons in each of these three categories. To evaluate the economic benefits of weed control the assumption was made that if chemical weed control practices were not used the quality of the alfalfa would drop from premium to fair and the price would decline accordingly. However, the weed population that would result if no weed control was used may result in a more drastic price decline than that associated with a decline in quality from premium to fair. This does not consider other factors that influence alfalfa quality (such as insect control, irrigation, fertility, variety, harvest schedule, etc.). One hundred percent weed control was assumed for each herbicide treatment. The intent of this article is not to compare the cost of different weed control practices, but rather to demonstrate the economic returns if these practices are sufficient to achieve complete weed control. 1987 alfalfa hay prices for each of the three districts were used in the economic comparisons for the time period corresponding to the weed control practice. An average use rate was selected for each herbicide application. Herbicide costs, rates of application, and application costs will vary with location, weed infestation, and supplier. The same yield was assumed with and without weed control. Weeds may increase or decrease yields depending upon the weed species, stand density, and other factors. Chemical weed control measures may include single herbicides or combinations of treatments. Therefore the cost of control is variable depending upon the treatment or combination of treatments necessary to control specific weed infestations.

Seedling Weed Control

Several herbicides are registered to control weeds during the stand establishment period (Table 1). Unfortunately, no single herbicide used in seedling alfalfa controls the broad spectrum of both broadleaf and grassy weeds commonly encountered. Therefore, a combination of herbicides is often necessary for complete weed control. Seedling weed control costs range from $13.25 to $36.66 per acre. The value of alfalfa in the three hay growing districts for the usual harvest time for the first cutting of a seedling field was used to determine the economic benefits of seedling weed control. A yield of 1.25 tons per acre was assumed for first cutting of a seedling field (Table 1.).

The economic advantages of seedling weed control were most evident in the Sacramento district. As the cost of the herbicide treatment increased the economic benefit obviously decreased. However, it must be noted that for complete weed control the combination treatments are frequently necessary. The benefits of seedling weed control are not only expressed as improved quality in the first harvest, but are can also be reflected in improved alfalfa stand and vigor.

Winter Weed Control in Established Alfalfa

The herbicides most commonly used for winter annual weed control (in areas other than the Imperial Valley) are Velpar, Karmex, and Gramoxone, alone or in combination. For the purpose of this analysis it was assumed that winter weeds would only impact the quality of first cutting. However, if first cutting was harvested before the weeds had reached physiological maturity, they may be a problem in second cutting as well. The economic returns from winter weed control are presented in Table 2. It must be understood that the presence of noxious weeds, such as coast fiddleneck or common groundsel, would reduce the value of alfalfa hay to an even greater degree. It may be nearly impossible to market hay heavily infested with fiddleneck or groundsel. A first cutting yield of 1.25 tons per acre was assumed.

Under the constraints of this comparison and the economic conditions of the 1987 hay market, winter weed control was cost effective, regardless of the treatment necessary to achieve complete weed control.

Summer Annual Grass Control

Three herbicides are used for summer grass control: Treflan TR-10, EPTC (Eptam or Genep) and Poast. Their cost for typical use rates and the economic benefit of their use is presented in Table 1. Summer annual grasses reduce hay quality for several cuttings. It was assumed that grasses effect hay prices for three cuttings in the Fresno and Sacramento Districts and for four cuttings in the Imperial Valley. A yield of 1.0 ton per acre for each cutting was used in this analysis.

Treflan TR-10 was the most cost effective of three herbicide treatments. However, all of the treatments provided a net positive return.

Conclusions

The current emphasis on alfalfa hay quality has resulted in significant differences in price between the different alfalfa quality designations. The presence or absence of weeds is a primary factor in determining hay quality. Comparisons made using 1987 alfalfa prices indicated significant net returns from most of the herbicide treatments.

Alfalfa hay prices were obtained from the Federal-State Market News Service

Table 1. Selected Seedling Weed Control Measures and the Possible Economic Returns

Treatment	Approx. Cost ($/A)	Net Return ($/A) From Treatment Imperial	Fresno	Sacramento
Balan	20.00	7.50	8.75	22.50
EPTC	14.25	13.25	14.50	28.25
Kerb	27.20	.30	1.55	15.30
2,4-DB	13.25	14.25	15.50	29.25
Poast	23.40	4.10	5.35	19.10
Balan+2,4-DB	33.26	-5.75	-4.50	9.25
2,4-DB+Poast	36.65	-9.15	-7.90	5.85

Difference between premium and fair quality hay for the time of first cutting in Imperial, Fresno, and Sacramento Hay Districts in 1987 was 22, 23, and 34 dollars, respectively.

Table 2. Winter Weed Control Measures and the Possible Economic Returns

Treatment	Approx. Cost ($/A)	Net Return ($/A) From Treatment Imperial	Fresno	Sacramento
Diuron	12.40	NA	16.35	30.10
Velpar	23.75	NA	5.00	18.75
Gramoxone	17.00	NA	11.75	25.50
Diuron + Velpar	23.05	NA	5.70	19.45
Diuron + Gramoxone	19.36	NA	9.40	23.15

Difference between premium and fair quality hay for the time of first cutting in Imperial, Fresno, and Sacramento Hay Districts in 1987 was 22, 23, and 34 dollars, respectively.

Table 3. Selected Summer Grass Control Measures and the Possible Economic Returns

Treatment	Approx. Cost ($/A)	Net Return ($/A) From Treatment Imperial	Fresno	Sacramento
Treflan	20.00	28.30	36.60	48.50
EPTC*	31.00	18.30	26.60	38.50
Poast	29.50	19.80	28.10	40.00

The average difference in alfalfa hay price for the summer months for Imperial, Fresno and Sacramento Districts was 12.33, 19.20, and 23.17 dollars, respectively.

FIGURE 1

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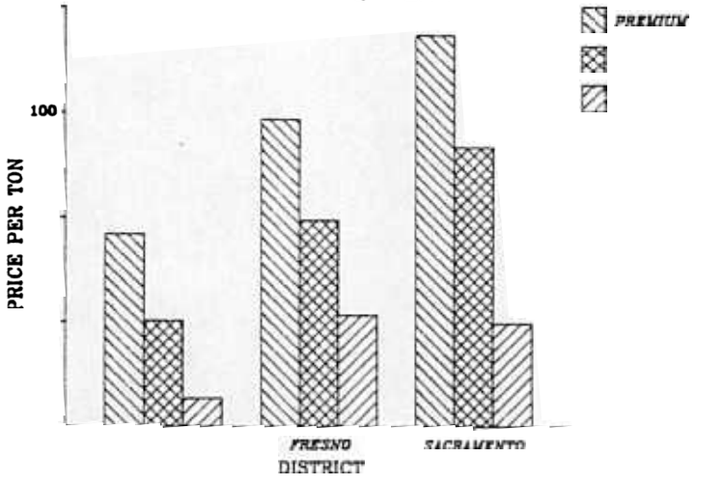

FIGURE 2

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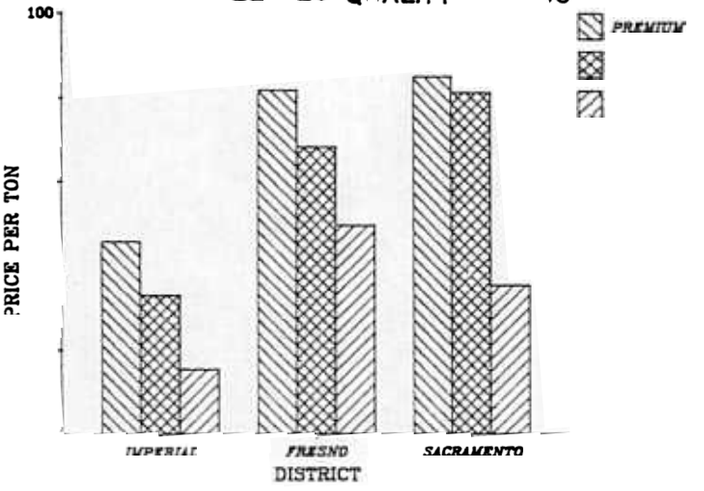

FIGURE 3

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