

WEED CONTROL ON ALFALFA IN THE LOWER COLORADO DESERT

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Considerations

An alfalfa grower in the lower Colorado desert region has both cultural and chemical alternatives open to him for weed control. The method or combination of methods he chooses may be different for each field. His choice of the "best" method varies with: planting date, previous crop history, weed pressure, weed species, soil type, salinity, irrigation method, previous experience and grower philosophy.

Planting Date

Most alfalfa in the lower Colorado desert region is planted in September-November, although occasionally spring plantings have been made. September plantings compete with summer weed species such as watergrass, sprangle top, ground cherry and purslane. November plantings compete with winter weed species such as canarygrass, winter cereals, mustards and chenopodiums. Thus the time when a field is planted determines what weed problems occur. If a grower is able to predict what weed problems he is likely to be faced with, he can choose the best chemical or cultural method to combat them.

Previous Cropping History

The number and species of weeds which will compete with a newly planted alfalfa stand is determined to a great extent by the previous crops grown in that field. A field which had been continuously cropped to a perennial crop such as asparagus would tend to develop perennial weed problems such as nutsedge, bermuda or field bindweed. A field which had been cropped to a winter crop such as barley or wheat might tend to develop winter weed problems such as sowthistle, canarygrass or London rocket. The intensity of these weed problems will be largely determined by how well weeds were controlled in previous crops and how many weeds were allowed to produce seed. "One year's seedling is seven years' weedling."

Weed Pressure

A grower who has kept his fields "clean" over several years may not have enough weeds to affect his alfalfa stand and thus may not need to take any control measures. A grower who has a field which he knows to be heavily infested may wish to combine two or three weed control methods in order to establish a vigorous alfalfa stand.

Weed Species

Some weed control measures are not effective on particular weed species. For instance, Balan® is an effective chemical control for watergrass but is ineffective on London rocket. Preirrigation and discing during the summer prior to an alfalfa crop is effective in reducing summer weeds but may not be as effective on winter species. Thus a general knowledge of what weeds can be expected is helpful in planning what measures to take.

Soil Type

The activity and movement of soil applied herbicides can be greatly influenced by soil type. The chance of crop damage in a sandy soil low in organic matter is much greater at a given rate of herbicide application than on a heavier textured soil with a higher organic content. A grower with a lighter textured sandy soil may wish to reduce the application rate of a preplant herbicide or eliminate it entirely. Soil type also influences water penetration, root penetration and soil temperature, all of which affect the growth rate of the weeds and the alfalfa.

Salinity

Soil salinity is one of the major problems in crop production in the lower Colorado Desert. Salinity can slow or eliminate alfalfa germination and growth. When high soil salinity and preplant herbicides are combined, the result can mean loss of stand.

Irrigation Method

Fields which are germinated utilizing a sprinkler system generally contain many more weeds than flood irrigated fields. Sprinkler irrigation is an excellent measure to assure maximum alfalfa germination, unfortunately it is also very efficient in germinating weeds.

Previous Experience and Grower Philosophy

A grower may find a particular chemical, cultural method or combination of methods that he considers best and use it in all his fields. This may seem shortsighted but more often when he gains experience with a particular method he can refine his procedure and timing to the point where he "makes" a particular method work.

A grower's "philosophy" of weed control may be such that he is willing to accept some stunting or loss of alfalfa vigor from a preplant herbicide in order to derive the benefits of weed control; or he may have the philosophy of alfalfa stand first and weed control later.

Methods

Once the grower has evaluated his situation with regard to planting date, previous cropping history, weed pressure, philosophy, etc., then he can decide which weed control measures best suit him. No one measure may always be sufficient. Often a combination works best.

Preventive Control

Preventive control is simply the unrelentless art of not letting any undesirable plants go to seed in the field or on the irrigation or drainage ditches. This is one of the best methods and yet it is often overlooked. This also includes not letting any unwanted seed come in with planting seed, manure or machinery. Theoretically, if prevention was perfect no other measures would need to be taken. This is seldom achieved.

Cultural Control

Preirrigation followed by discing can accomplish three important tasks. It can reduce soil salinity in the germination zone, allow the preparation of a more desirable seedbed, and reduce the weed seed population. All three can mean the development of a stronger, more competitive alfalfa stand.

Anything that is done to assure a more uniform, fertile and desirable seedbed can help the alfalfa plant get off to a better start and be more competitive to weeds. This could include such practices as land leveling, phosphorus fertilization and salinity control measures such as tilling.

Crop rotation measures should not be overlooked. Plant diseases can buildup an inoculum in the soil under a continuous alfalfa cropping system. "Root rots" are often the cause of stand loss, particularly under conditions of poor drainage and high soil moisture. Weeds are often allowed to gain a foothold in these diseased areas. Even when affected alfalfa seedlings recover they are often poor weed competitors.

Normal harvesting operations for baling, dehydrating, cubing or pasturing alfalfa are often successful in eliminating a good portion of annual weeds in a new stand of alfalfa. If weed pressure is not severe, many of the annual weeds will be eliminated after the second cutting. Quality of hay may be reduced by some weed species, however, in the first, and possibly the second, cutting.

Chemical Control

Three chemicals are used preplant in the lower Colorado desert region: Eptam®, Balan®, and Tolban®.

In order to perform adequately, these herbicides should be thoroughly mixed in the soil. Discing twice is recommended. The disc should move rapidly enough to provide a good mixing action. Herbicide failures can often be traced to poor incorporation.

Since Eptam® is a volatile compound, it should be incorporated immediately after application. A spray boom set on the disc is one of the best methods of application. Lower Eptam® rates should be used on lighter textured soils. Where plantings are made on corrugations to germinate the alfalfa, damage can occur in the center between corrugations, particularly in coarse textured soils.

Eptam® controls a broad spectrum of weeds; however, its herbicidal effects last for only a few weeks. Balan® and Tolban® have longer residual action; however, they will not control weeds in the mustard, composite, and nitshade families.

These materials can reduce seedling vigor particularly when combined with disease, soil salinity, adverse weather conditions or coarse textured soils.

Two chemicals are available for use post-emergence to the alfalfa and weeds; these are 2,4-DB for control of broadleaf weeds, and IPC granules for control of winter annual grasses.

2,4-DB is applied when the broadleaf weeds are less than three inches in height or diameter. If the weeds are larger, the control will be slow and erratic. 2,4-DB can be applied by ground or by air. Air application is frequently more successful since it can be applied when the field is still wet and the weeds are small. It should not be applied while standing water is present in the field. The alfalfa should not be irrigated for at least seven days following treatment with 2,4-DB as stunting of the alfalfa may occur.

IPC is applied for control of canarygrass, wild oats, rabbitsfoot grass and volunteer cereals. It is used in the granular formulation. IPC should be applied shortly before an irrigation. Delaying the irrigation can cause some loss of control from volatilization of the IPC.

Weeds which have been troublesome in established alfalfa fields have been primarily watergrass and sprangletop. Watergrass and sprangletop not only limit production through direct competition in the alfalfa, but they also reduce hay quality.

Watergrass and sprangletop have been effectively controlled with multiple water run treatments of Eptam® starting in March and continuing after each cutting or every other cutting until late summer.

Conclusions

Preplant and seedling weed control in alfalfa is a complex problem. The best method for weed control varies from grower to grower and field to field. Before a particular control program is decided upon, consideration must be made as to cropping history, weed species, grower experience, etc. After making these considerations there are several valid measures that can be taken. Often a combination of weed control measures is better than any one alone.

Example: A grower has a field which has previously been cropped to wheat. He is planting in late November and knows he will have a problem with volunteer wheat and canarygrass which had gone to seed in the previous wheat crop. The soil is coarse textured, the weather has been cool and he is worried about alfalfa germination.

Solution: A preirrigation in mid October would have been helpful in germinating some of the canarygrass seed and much of the wheat. Careful attention to seedbed preparation and leveling can help in obtaining a uniform stand. Preplant herbicides might not be wise in this case where alfalfa germination conditions are not ideal and the soil is coarse textured. The use of IPC granules as a post-emergence treatment just prior to the second or third irrigation would seem advisable if the expected wheat and canarygrass problems materialize and are severe enough to limit stand establishment.