

WEED CONTROL IN SEEDLING ALFALFA

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In California where the climate is mild, plant life, especially weeds, thrives the year round. Weeds have harassed the alfalfa grower ever since the crop was introduced into the state in 1849. Weeds frequently are as thick in the field as the alfalfa; when they are, they smother the alfalfa by cutting out the sunlight and often prevent stand establishment. When they are less abundant, they may not completely crowd out the stand, but they weaken the alfalfa plants, retard growth by competing for soil nutrients, sunlight, and moisture; and make the first crop almost worthless.

Alfalfa in California is usually planted from November to March. Consequently, winter annual weeds are the major problem in establishing an alfalfa stand. Dr. Robert Norris, Assistant Professor of Botany at the University of California, Davis, has listed the important weeds in seedling alfalfa. They are fiddleneck, the various mustards, lamb's quarter, shepherd's purse, chickweed, knotweed, pigweed and Jimson weed. Others that infest alfalfa and cause more damage to quality than to the stand are groundsel, pineapple weed, speedwell, nettle-leaf goosefoot and others.

Winter annual grasses and volunteer grain can cause as much damage as the broadleaf weeds. Several species of foxtail cause serious problems in establishing alfalfa stands. Foxtail, in addition to crowding out the stand, has a bearded head when it matures that irritates the mouths of livestock when they feed making it unpalatable as forage. Gale Gurtle, Tulare County Dairy Farm Advisor, says "Foxtail infested hay is practically worthless as feed. If you do feed animals the hay, the seeds end up in the manure. Then the next year you've got foxtail all over the ranch".

Wild oats and volunteer barley are often serious problems in crowding out a stand. However, they are more palatable as feed than the other weeds.

When annual bluegrass has been a problem in previous crops it can also cause damage to the stand.

In late spring, when soil temperatures are 70 to 80 degrees, summer annual broadleaves and grasses may germinate and become a problem. Pigweed, careless weed, watergrass, bristlegass, lovegrass, spangle top and many other emerge in spring planted alfalfa. Herbicides such as Eptan[®], Balan[®] and Planavin[®] will control these summer annuals so they do not become a problem in the summer months. Summer annual grasses are one of the serious weed problems in the third, fourth, and fifth cuttings in the central valleys.

CULTURAL CONTROL OF WEEDS IN SEEDLING ALFALFA

The Agricultural Experiment Station of the state university and the Agricultural Extension Service through field experiments have developed management practices to help prevent serious weed problems in seedling alfalfa. Although management practices do not completely eradicate or control weeds they can minimize weed damage.

Preparing seedbeds early and preirrigating before planting bring up many weeds that can be disked under when they are small. Since disking may bring new weed seeds near the surface, the practice may need to be repeated as new weeds emerge.

Broadleaf weeds usually grow faster and taller than new alfalfa. Equipment to shred or mow the weeds just above the young alfalfa temporarily stunts them and lets the sunlight reach the alfalfa, giving it a chance to compete with the weeds. Since the weeds are only temporarily stunted, they will sometimes have to be cut two or three times to prevent shading out the new alfalfa.

Getting a good stand of alfalfa is important in preventing a weed problem in a sparse stand of alfalfa usually brings about a weed problem due

to the lack of plant competition. Poor stands are usually caused by moisture shortage, cloddy seedbeds or planting too deep. Pre-irrigating and then preparing the seedbed is the best assurance of a good stand. Planting alfalfa in dry soil without pre-irrigating involves a great deal of risk. The rain may be insufficient to wet the soil thoroughly enough to germinate all the seed. In this case, the grower has to irrigate to get his stand established. Irrigating crusts and compacts the soil surface often resulting in a thin and weedy stand.

To provide plenty of time to pre-irrigate and prepare a good seedbed growers should plant alfalfa after a crop that is harvested early, such as barley, corn or blackeyes.

Soils adequately supplied with nutrients produce healthy vigorous alfalfa plants that will compete with weeds. Fertilization may be necessary to supply these nutrients.

WEED CONTROL IN SEEDLING ALFALFA WITH HERBICIDES

Before a grower plants his alfalfa he should know what weeds are a problem. He will know this if he keeps records of weeds in each field. When he knows his weed problem, he can plan a weed control program that will most effectively control those particular weeds.⁹

If grasses were a problem in corn or milo the previous year, he can use herbicides that are specific for controlling grasses, such as Eptam[®], or Balan[®]. These materials are used as preplant, pre-emergent soil-incorporated materials.

The preceding crop helps determine the right herbicide for the most effective weed control. Following a cereal crop--oats, barley or wheat--the herbicide selection would be Eptam[®], the most effective soil-applied, preplant, pre-emergent herbicide for controlling these weeds. Balan[®] and Eptam[®] are both effective grass killers, but Balan[®] will not control cereal grasses.

Also important is knowing whether the grasses were winter or summer annuals. If they were both, the time of planting, as well as the selection of the herbicide, become important. Balan[®], for example, has a longer residual action in the soil and will control weeds for as long as six months after application. If the alfalfa is planted in February or March, the one herbicide could control both winter and summer grasses through the first year's production period and result in great economic advantage. Hence, it is important to know how herbicides work as well as which weeds they will control.

In growing cotton, grasses and certain broadleaved weeds have been controlled with pre-emergent herbicides and are not usually a problem in new alfalfa. However, these herbicides do not control weeds in the mustard family. If mustard was uncontrolled in cotton, it will carry over into alfalfa and can become a serious problem. The choice of herbicide then would be a post-emergent one that kills weeds by translocation such as 2,4-DB.

Following a crop of sugar beets, a row crop that has more weed problems than any other cultivated crop (unless herbicides were effectively used), the grower is usually confronted with both winter and summer annual grasses and broadleaf weeds in his new alfalfa. In this case, it is wise not to plant alfalfa. To control the weeds, it would be necessary to use both a pre-emergent soil application herbicide to control the grasses and a post-emergent soil application herbicide to control the broadleaved weeds. This would cost about \$14 to \$16 per acre. Planting a row crop, such as cotton, in which weeds could be effectively controlled by cultivation and herbicides, rather than alfalfa, would be the cheapest and easiest way to clean up the weed problem for alfalfa the following year.

Most weed species in seedling alfalfa are controlled either by a soil-applied preplant herbicide or a post-emergent herbicide. But until recently one weed, fiddleneck, could not be effectively controlled. After seven years of field experiments, University of California weed specialists, farm advisors, and industry researchers found that a new compound, bromoxynil, gives excellent control of this weed as a post-emergent contact herbicide. This material also controls a wider spectrum of

weeds than any other herbicide presently being used for weed control in new alfalfa. This new compound is not registered for use in alfalfa, and unfortunately cannot be legally used. Field experiments conducted by the University of California and industry are still in progress to test the safety of this material. Recent data from the experiments shows promise that the material is an effective herbicide in seedling alfalfa and that it is not hazardous to use on alfalfa in areas where temperatures go below 70 degrees F. Registration of bromoxynil would help growers in controlling weeds in new alfalfa, especially in areas where fiddleneck is a serious problem.

THE UNEXPECTED PROBLEM

A grower not expecting a grass problem may plant alfalfa without using a soil application preplant herbicide. As the alfalfa emerges, much to his surprise, the grass is as thick as the alfalfa. When this happens, his choice of herbicides, when the alfalfa is in the seedling stage, is limited to one herbicide IPC granules as a soil application, post-emergent treatment. This material must be washed into the soil by rainfall or by a sprinkler system, absorbed by the roots and translocated through the plant to kill the grass weeds. Since most alfalfa growers do not use sprinklers, they must rely on rainfall to wash the material into the root zone of the grass plants. Growers have had failures when the weatherman misses his forecast of rain or if it doesn't rain at least half an inch to wash the material into the soil. This material is volatile and will dissipate in a short time after application. Some growers have the materials applied at the beginning of a rain storm to reduce the gamble of getting weed control.⁹

Whether to use a contact herbicide (dinitro-selective) or one that is translocated (2,4-DB) as a post-emergent treatment for broadleaf weeds is sometimes a difficult decision for the grower. Dinitro-selective is cheap and is effective in control of very small weeds. It is most effective when a ground spray is used to provide thorough spray coverage of the plants. What weeds dinitro doesn't kill will grow to full maturity. Herbicides that kill by translocation are more expensive, but will kill larger weeds and thorough coverage is not as essential as with contact materials. These herbicides are applied by air when the soil is too wet for ground applications with contact materials.

Perennials, such as a Johnsongrass or Bermudagrass are not problems in seedling alfalfa, but may become problems in established stands. If these weeds were a problem in the previous crop and were left uncontrolled, the grower would be wise not to plant alfalfa. There are herbicides that give fairly good control of these perennial weeds,³ but because of residue problems, are not legal to use in alfalfa used for forage.