

SUMMER ANNUAL GRASS CONTROL-WHAT ARE THE STRATEGIES?

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OVERVIEW

Grass weeds are a major concern to alfalfa hay growers throughout the western states from the time of stand establishment throughout the life of the stand.

Grasses especially become a serious problem as the alfalfa population starts to decline reducing the yield of alfalfa. Grasses are more adaptive than most broadleaf weeds and able to endure frequent harvest intervals since their growing point is near or below the soil surface. Grasses (Yellow foxtail, *Setaria*, Barnyard grass *Echinochloa*) will change growing habits to a short plant when frequently mowed. Adjusting the cutter bar to a lower height to stunt or remove weeds has been effective on broadleaf weeds but unsuccessful for grasses. Grasses are extremely competitive in an alfalfa environment thriving in high moisture situations and nitrogen fertilizers conditions and are very effective in filling spaces where alfalfa plants have died.

Undesirable grasses are costly to the alfalfa producer and when visible in the bale maybe discounted anywhere from \$50 to \$100. Grasses are low in protein, digestible nutrients and lower forage quality. Some grass species are host for toxic fungi, and create health issues from the barbed and bristly seed heads that lodge in the animal's mouth.

ANNUAL AND PERENNIAL GRASSES

Grasses can germinate year around in alfalfa and complete their cycle in one year or last for several years. Annual grasses, germinate from seed, grow for several months, develop a viable seed, die and repeat the same cycle the following year. Annual grasses (Foxtail barley, *Hordeum leporinum*, annual bluegrass, Poa annual) will germinate in the fall/winter months and referred to as winter annuals. Those that germinate in the spring and summer time frame (yellow foxtail, barnyardgrass, Mexican sprangletop *Leptochloa*) are summer annuals and most problematic in alfalfa.

Perennial grasses (Bermuda, Johnson, Goose and Bulbous blue grass) germinate when soil temperatures begin to warm, establish during the summer months and live for many years. They spread by seed but more often by vegetative structures called rhizomes (below ground roots) or stolens (above ground stems). Perennial grasses are the most difficult to control once they establish a foot hold in alfalfa.

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CULTURAL CONTROL MEASURES

Pre-irrigation and Crop Rotation.

Grass populations are reduced by pre-irrigating to promote early weed germination prior to planting. After emergence, weed seedlings are controlled through cultivation. This does not completely eliminate all weeds but greatly reduces the viable seed population and makes other control measures more effective. Pre-irrigation also enhances final seedbed preparation, promotes uniform planting depth and aids in the incorporation of preplant herbicides by minimizing cloddy soil conditions. Crop rotations having different growth types can disrupt weed cycles from competition, cultivation and use of selective herbicides.

PLANTING DATES

One of the most important cultural practices to control weeds is to plant at an optimum time for alfalfa seedling growth, and when weed populations and growing conditions do not favor the weeds. The range of soil temperature suitable for alfalfa planting and germination is between 65° to 85°F (18 to 29°C), which is typically in the early Fall (Sept.-October) in California's deserts and the Central Valley. Time of planting can have a large effect on weed problems. Alfalfa planted in the winter will germinate and grow very slowly. Winter weeds are better adapted to cold temperatures than alfalfa growing rapidly to compete vigorously with the alfalfa. In contrast, summer planting in very hot temperatures can also slow alfalfa germination problems and result in infestations of summer grasses which flourish under these conditions.

CHEMICAL CONTROL

Pre-plant/ pre-emergent herbicides.

Pre plant herbicides are applied to the soil and thoroughly incorporated prior to planting alfalfa. They control weeds at the time of germination of alfalfa. EPTC (Eptam) and benefin (Balan) are two pre-plant herbicides used at stand establishment to control a wide range of grasses. Balan and Eptam effectively control small-seeded broadleaves and grasses. Benefin is effective for spring plantings because it controls many summer annual grasses.

EPTC (Eptam) EPTC is effective for pre-emergence control of most grasses and volunteer cereals such as wheat, barley and oats. It belongs to the thiocarbamate chemical family which is subject to volatility and loss under warm windy conditions. It requires immediate incorporation. EPTC and benefin can be combined at reduced rates of each to expand the spectrum of weeds controlled.

Pre-Emergent Herbicides for Established Alfalfa

Trifluralin (Treflan) can be applied as a liquid or as a granular pre-emergence herbicide for control of grasses and some broadleaf weeds in established alfalfa. Long season control of barnyardgrass, yellow foxtail, junglerice, sandbur, and sprangletop in established alfalfa with

trifluralin applied in early spring (February) at 2.0 lbs ai acre. It is important to incorporate Treflan within a few days due to its high volatility formulations.

EPTC (Eptam) can also be an effective tool in established alfalfa for grass and nut sedge control. However, it is short lived so multiple applications are generally needed for season long control.

Pendimethalin (Prowl) was recently registered for use in established alfalfa in late 2007/08. Prowl similar to Treflan is in the dinitroaniline herbicide family and very effective on controlling grasses, many broadleaf weeds and dodder when applied pre-emergent to weed germination. Prowl H2O is formulated to be stable on the soil surface for several weeks with little volatility or loss. Another advantage is prowl liquid formulation that can be tank mixed with other pre or post emergent liquid herbicides (paraquat, Velpar, Chateau, 2,4DB, Prism, Poast and Raptor) to compliment a long term control strategy. The rates of Prowl can be adjusted from 2 to 4 quarts per acre depending on weed type and expected weed pressure. The higher rates applied during January/February have provided excellent long season grass control into late summer cuttings. Research has not shown any crop injury issues with Prowl H2O.

Flumioxazin (Chateau)- herbicide is the most recent herbicide registration for use in established alfalfa. It has been tested primarily as a winter applied herbicide to control winter germinating weeds and grasses. Grasses are not its primary strength; however, it has shown extended grass control over winter applied *Hexazinone* (Velpar) lasting into the first or second cutting of alfalfa. Chateau can be tank mixed with other post and pre emergent grass herbicides (Prowl, Prism, Poast) for a more effective and longer grass control program. Chateau has a 25 day PHI between cuttings which allows use during the summer growing period. However, limited research to determine summer use effectiveness for grasses has yet to be determined.

Post Emergent Herbicides

Sethoxydim/ clethodim Poast /Prism – Are selective grass herbicides controlling both annuals and perennials. They have no phototoxic effect on alfalfa or broadleaf weeds including sedges. These herbicides work best on young immature grasses before tillering stage (before seed heading) that are vigorously growing and not drought stressed. Poast or Prism can be used between alfalfa cuttings to control summer grass problems including yellow and green foxtail, barnyard grass and perennial grasses. Well established perennial grasses usually require multiple applications. Both herbicides can be tank mixed with many other herbicides.

Imazamox Raptor– Is a selective translocated herbicide that controls broadleaf and grass weeds. The weed spectrum controlled is similar to Pursuit except it is far more effective on grasses—especially winter annual grasses. Raptor is applied to alfalfa having two or more trifoliolate leaves. Performance is best when weeds are small, 1-3 inches and vigorously growing. The addition of a nitrogen fertilizer with a surfactant greatly enhances control of marginally sensitive weeds.

SUMMARY

Grasses are generally more competitive to alfalfa than broadleaf weeds because they are not impacted from multiple cutting cycles and continue to grow and set seeds throughout the summer. Grasses respond favorably to the same environmental and farming conditions of alfalfa and utilize high amounts of water and nitrogen fertilizer. A common problem is Foxtail barley, yellow and Green foxtail and Ripgut brome grass which form seeds heads that are especially a problem in mouths of animals. Grasses are generally lower in nutritional value than alfalfa reducing the value and salability as dairy hay. In addition to good cultural and irrigation management, control measures for summer grass problems have been limited to use of post emergence herbicides Poast and Prism which can provide erratic control for large well tillered plants especially late in the season. Post herbicides do not provide soil residual activity so multiple applications are sometime necessary. The new registration of Prowl and Chateau herbicides are effective on many of the grass species occurring in alfalfa and will offer opportunities for use in winter and summer time applications, extended weed control across a wide range of weeds.