Managing Consistent, Trouble-Free Rotation From Alfalfa to Corn

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The forage and dairy industries have been bolstered by the demand for fresh milk year-round and innovations that enable production of alfalfa and hay, corn for silage and grain and forage mixtures – including the development of new herbicides.

Alfalfa is considered the highest yielding forage crop, making it a valuable commodity for both on-farm use and as a cash crop. Alfalfa's high-protein forage is prized for milk producing cows on dairy farms, along with other forage such as white clover pastures and red clover hays. With adequate soil moisture, alfalfa established using herbicides for weed control may produce two to three crops in the first year. Pre- and post-emergent herbicides can help growers enhance yield potential by reducing weed competition for important nutrients if weeds are controlled while the seedlings are still young and before weeds are 3" tall. To keep alfalfa stands healthy and enhance yield, many growers are using Raptor® herbicide in-season as the primary herbicide to control a wide spectrum of broadleaf weeds, such as pigweed and lambsquarter, as well as annual grass weeds.

NATURAL LIFE CYCLE OF ALFALFA

Alfalfa and other perennial forages are typically sown in the spring, either with a companion crop of spring oats or alone with the use of herbicides. From late August to mid-October, alfalfa stores nutrients in its roots. The storage of nutrients from late summer through fall enables the plant to emerge with a rapidly growing leaf system in early spring.

After three to four years, depending on the condition and health of the stand, the grower may choose to rotate to another crop such as corn. At that point it is necessary to control the remaining stand by either deep plowing or through the use of herbicides such as glyphosate and dicamba. Due to allelopathic effects, alfalfa should not be reseeded until after three or four years of rotation to another crop.

ALFALFA TO CORN: TROUBLE-FREE ROTATION

Due to its extensive root system, alfalfa is an excellent competitor for water and nutrients. Alfalfa's large root system can grow an average six feet per year. Active alfalfa roots have been found 60 ft or more below ground—making the roots the proverbial "tip of the iceberg" for control of the alfalfa plant *(Deborah Samac, USDA-ARS, St. Paul; Dean Malvick and Charla Hollingsworth, University of Minnesota; Brian Hudelson and Amy Gibbs, University of Wisconsin).*

The same characteristics that make alfalfa such a hardy, drought-tolerant and competitive plant present the greatest challenges when rotating crops. Since alfalfa is a legume and a close relative of the soybean, rotation from one legume to another would be difficult to control with available herbicides. When it is time to rotate from alfalfa, the best no-till solution is rotation from alfalfa to corn *(Chris Boerboom, Ext. Weed Scientist, University of Wisconsin)*. Corn can take advantage of the residual nitrogen (N) left by the alfalfa crop and there are more herbicide choices in corn to control alfalfa.

Alfalfa has the ability to "fix" soil N, despite environmental stresses such as drought. Rotation to corn after alfalfa provides N-rich soil with a range of 100-150 lb of N/ac *(JoAnn Lamb, USDA-ARS, St. Paul)*. With today's fertilizer prices, it is certainly economically advantageous to utilize this "free" nitrogen.

BEST ROUTE FOR REMOVING COMPETITIVE WEEDS

Alfalfa is best controlled by herbicides in the fall by taking advantage of its natural life cycle. During this time, nutrients are moving to the roots for winter storage. Due to this predominant downward flow, systemic herbicides such as dicamba, 2,4-D or glyphosate are more easily translocated into the root system – ensuring overall, consistent control. Targeting fall herbicide applications is therefore the most effective way to control the plants. However, alfalfa can also be effectively controlled with spring herbicide applications made prior to or at planting once sufficient top growth has occurred, allowing for more uptake of the herbicide through the foliage. Whether using a fall or spring application, good control of alfalfa ensures a clean start to the corn and helps eliminate unnecessary competition.

Distinct® is an effective systemic herbicide for fall and spring applications to control many annual and perennial broadleaf weeds. An Iowa field trial (Table 1) showed that Distinct can effectively control alfalfa when applied preplant to corn. A combination of Distinct with 2,4-D was also effective and may be more economical. Although not tested in this trial, Distinct may also be tank mixed with glyphosate to provide additional control of problem grasses plus provide another herbicide mode of action to control the alfalfa.

Table 1. *Controlling alfalfa when rotating corn.*

Treatment*	Rate	Timing	Control
Glyphosate 4L + 2,4-D	1.5 pt/ac 1pt/ac	Pre-plant	63%
Distinct	4 oz/ac	Pre-plant	85%
Distinct	8 oz/ac	Pre-plant	98%
Distinct + 2,4-D	4oz/ac 1pt/ac	Pre-plant Pre-plant	97%

**All treatments were applied with Nonionic Surfactant and Ammonium Sulfate.*

POSTEMERGENT SOLUTIONS FOR CORN

Alfalfa should be controlled prior to corn planting to eliminate competition and for best yield protection. However, if incomplete control is obtained prior to planting or regrowth occurs there are several options to control the undesirable alfalfa postemergent in corn. Status® herbicide is especially designed to fit corn grower's needs. Its safener technology makes it crop safe and its multiple modes of action controls most problem broadleaf weeds. If glyphosate tolerant corn is grown, Status can be mixed with glyphosate. This combination is an excellent program for control of all of your common grass and broadleaf weeds in corn.

When it is time to rotate from alfalfa to corn, keep in mind the many tools available. If deep tillage is not an option, remember Distinct herbicide in combination with glyphosate or 2,4-D provides outstanding control of alfalfa. If one needs to control escaped alfalfa in standing corn, Status herbicide is an excellent option. These herbicide programs provide a clean start to a corn crop, maximize yield and allow utilization of the "free" nitrogen left by alfalfa.