WEED MANAGEMENT IN ALFALFA

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The importance of weed control in forage production should not be overlooked, especially when you consider the high investment associated with alfalfa and other legume forages. Weed management strategies in forage legumes should first focus on cultural practices and then on chemical weed control options. Vigorous, densely growing forage legume stands tend to have fewer weed problems. Thus, cultural and management practices that promote a highly competitive forage stand help prevent many weed problems. These practices include: 1) liming and fertilizing fields based on soil test recommendations; 2) seeding well-adapted, vigorous, and long-lived varieties; 3) buying weed-free seed; 4) cutting forage at proper time intervals or growth stage; 5) timely control of insect and disease problems; and 6) rotating fields with other crops to interrupt the buildup of certain weeds.

Because of the aggressive nature of certain weed species, they can become established despite preventive efforts. Therefore, herbicide treatment may be necessary. The specific herbicides and control strategies available for use will depend on the type of forage you grow (alfalfa or alfalfa/grass mixture), whether your stand is a new seeding or an older established stand, and the crop growth stage (dormant, non-dormant, or between cutting).

NEW SEEDINGS

Weed control is more critical during the first year than any other period of forage production. Forage seedlings grow slowly and are easily overcome by rapidly growing weeds. It is important to start with a good stand of alfalfa. A uniform, dense stand is more likely to survive longer and have fewer weed problems than a thin stand.

Site Selection: Consider the field history when you select a field for alfalfa production. It may be difficult to establish and maintain a weed-free forage stand in fields known to be infested with weeds such as musk thistle, curly dock, or yellow nutsedge. Also, remember that some herbicides applied to a previously-grown crop have the potential to carryover and cause injury to newly-seeded forages. Alfalfa and other forage crops are sensitive to low concentrations of herbicides that contain atrazine (i.e. AAtrex, Bicep II Magnum, Degree Xtra, Guardsman, FulTime, Harness Xtra), and clomazone (i.e. Command). More information on herbicides that have a potential to injure alfalfa and other forages can be obtained from your local county Extension office and on the label of herbicide products used in a previous crop.

Time of Seeding: Weed control is one of many factors that will determine whether you seed your fields in the spring or fall. As a general rule, the summer complex of weeds

tend to overcome spring seedings; whereas, the winter weed complex tend to outcompete forages seeded in the fall. Therefore, for optimum establishment of most forage crops, you should consider fall seedings in fields that have a history with such weeds as large crabgrass, foxtails, or lambsquarters; consider spring seedings in fields that are potentially infested with common chickweed, henbit, and yellow rocket.

Plant Weed-Free Seed: Using weed-free seed is the first step to prevent the introduction of weeds. You should check the seed tag to determine the purity of the seed. In the case of alfalfa, the maximum total of weed seed contamination permitted by Kentucky seed regulations is two percent of weed seed by weight. Such species as johnsongrass and Canada thistle are considered noxious weeds and are prohibited as contaminants in seed lots sold for sowing alfalfa fields. Annual bluegrass, buckhorn plantain, dodder, giant foxtail, quackgrass, sorrell, and wild garlic are examples of noxious weeds that must be listed on the label if they are present and must not exceed a certain limit depending on species.

Liming and fertilization: Adjusting soil pH and nutrient levels according to soil test recommendations is important during the establishment phase and throughout the life of the forage stand. The objective is to achieve a competitive alfalfa stand which is capable of suppressing weed emergence and growth. Proper liming and fertility are not effective for eliminating weeds that have already become established, especially in areas where the forage stand is poor. Likewise, some weeds such as chickweed, curly dock, and crabgrass respond favorably to fertilization. Thus, other weed control methods are often needed in addition to proper fertility.

Clipping new seedings: Clipping or mowing can be an effective option for controlling some weeds such as common cocklebur or jimsonweed in legume forage stands. This method controls weeds by removing the leaves and lateral buds that develop new growth. Many annual broadleaf weeds have buds that develop above the soil surface. They are more easily controlled with clipping or mowing than grasses, which have crown buds near the soil surface. Mow as low as possible to be effective. Because alfalfa plants and other legumes have crown buds, they can tolerate low clipping. When you clip new seedings, be careful not to smother forage legumes with heavy residues; thus, remove clipped vegetation when weed infestations are heavy.

Herbicides for new seedings: Herbicides used for new seedings are designed to eliminate or reduce competition from rapidly-growing weeds during the establishment phase. In some instances herbicides that aid alfalfa establishment have also contributed to higher yields in subsequent years and greater longevity of stands. During seedling development, forage grasses are usually susceptible to injury from herbicides used in legume establishment. Subsequently, no herbicides are registered for new seedings of legume-grass mixtures.

ESTABLISHED STANDS

Established forage legumes are capable of growing fairly rapidly and competing against many weed seedlings during the growing season. However, weeds gradually

invade fields where forage stands decline with age. Timely mowing and the use of herbicides may aid in weed control and prolong the life of the stand.

Problem weeds that occur in field borders, along fence rows, or in adjacent fields, should be mowed or sprayed to prevent production and spread of weed seed from these areas into alfalfa and other hay fields. This is particularly important for such weeds as musk thistle, which is capable of producing a large number of seeds that are easily spread to new areas.

Clipping established stands: The routine mowing of legumes for hay is sometimes effective in controlling some perennial weeds by reducing food reserves and plant vigor. In grazed forages livestock often selectively graze and may leave such weeds as chicory or musk thistle. Mowing soon after livestock have been removed from the field can help suppress growth of these weeds and prevent seed production and further spread of infestations.

Herbicides for established stands: Several herbicide options are available for established alfalfa stands. You can use many of the same herbicides available for new seedings. Furthermore, the deep root system of established alfalfa plants enables them to tolerate certain herbicides that are not suitable for new seedings. When selecting herbicides for forage legumes, consider such factors as 1) whether the alfalfa is a pure stand or alfalfa-grass mixture, 2) whether the herbicide can be applied when the crop is non-dormant, during the dormant season, or as a between cutting treatment, 3) effectiveness on weed species to be controlled, 4) feeding and grazing limitations, 5) rotational crop restrictions, and 6) cost of treatment. Table 1 is a guide to herbicides labeled for use in alfalfa and the general effectiveness for selected weed species. Before using a herbicide always read and follow label directions.

HERBICIDE OPTIONS

Before Seeding – Preplant Incorporated: In alfalfa seeded by conventional-till methods pre-plant weed control options are somewhat limited. In spring seeded alfalfa BALAN or EPTAM can be applied as a preplant incorporated treatment to help curtail growth of summer annual grasses such as crabgrass and foxtails. These herbicides should be incorporated immediately after application. Small grain nurse crops or other grasses seeded with the alfalfa will be injured. For alfalfa seeded in the fall the winter annual weed complex such as common chickweed and henbit can be more of a problem. Balan and Eptam do not provide adequate control of winter annual broadleaf weeds and are not often recommended with fall seedings.

Before Seeding – Preplant Foliar: GRAMOXONE MAX and GLYPHOSATE (eg. Roundup, Touchdown, etc.) are herbicides that can be applied preplant to fields that will be seeded to alfalfa. These non-selective foliar herbicides are often used in alfalfa seeded by no-till methods to burndown existing vegetation. Gramoxone MAX and Glyphosate provide control or suppression of many annual grasses and broadleaf

weeds and certain perennials that are actively growing at time of alfalfa seeding. They should be applied before the crop emerges; plants emerged at time of application will be killed.

After Crop Emergence – New Seedings: Good weed control is essential during the early establishment phase of alfalfa. A few herbicide options are labeled for use on the crop during the first year of establishment. However, herbicides can only be used on pure stands of alfalfa since alfalfa interseeded with grass forage species such as orchardgrass or timothy will be killed or severely injured. The availability of a herbicide option also depends on whether or not the alfalfa is non-dormant (actively growing), between cuttings (i.e. has been recently cut whereby top growth has been removed), or dormant.

For newly established alfalfa, herbicide products labeled for use on non-dormant alfalfa stands include BUCTRIL, CONNECT, BUTYRAC 200, POAST, POAST PLUS, SELECT, PURSUIT, and RAPTOR. Since BUCTRIL and CONNECT are effective for control of small annual broadleaf weeds, they can only be applied to alfalfa seedlings. Other herbicide products listed above can be applied to both new seedlings and established stands of alfalfa. BUTYRAC 200 is primarily effective on small, actively growing broadleaf weeds. Whereas, POAST PLUS, POAST, and SELECT are effective only on weedy grasses; therefore, they are excellent herbicide options for selectively controlling several annual and perennial grass species in alfalfa. PURSUIT and RAPTOR are good options for control of both various broadleaf weeds and selected grasses, particularly when weeds are small and actively growing.

Immediately after alfalfa has been cut GRAMOXONE MAX can be applied as a between cutting treatment, but must be applied within 5 days after cutting. GRAMOXONE MAX provides broad spectrum control of various annual weeds. Use rate on new first year seedlings of alfalfa is lower than the rate after the alfalfa has become more established (stands more than one-year old). When alfalfa is dormant during the winter months, GRAMOXONE MAX or KERB can also be applied for control of various winter annual weeds.

After Crop Emergence – Established Stands (more than one-year old): After alfalfa becomes well established other herbicide products can be used, but timing of application depends on the stage of alfalfa growth. SENCOR, SINBAR, VELPAR and KERB can be used as a dormant treatment to control and suppress growth of various weed species during the winter months. Whereas throughout the growing season, between cutting applications can be made with VELPAR and GRAMOXONE MAX when applied soon after alfalfa has been cut, but before alfalfa regrowth exceeds 2 to 3 inches. PURSUIT and RAPTOR are also labeled for applications in the fall or spring to established alfalfa stands when plants are dormant, semi-dormant, or as a between cutting application. Any applications of PURSUIT or RAPTOR on established alfalfa should be made before significant alfalfa growth or regrowth occurs, generally less than 3 inches.

Table 1. Guide to the Relative Response of Weeds to Herbicides

	Before Seeding		Non-Dormant						Dormant Season			Dormant or Between Cutting				Spot Treat
	Balan	Eptam	Buctril	Butyrac 200	Poast Plus/Poast	Select	Pursuit	Raptor	Kerb	Sencor	Sinbar	Pursuit	Raptor	Velpar	Gramoxone Extra	Glyphosate[1]
Cool Season Annuals																
Common Chickweed	F	F	F	P	N	N	G	G	G	G	G	G	G	G	G	G
Henbit	P	F	F	P	N	N	F	F	F	G	G	F	F	F	F	G
Mustard, Wild	P	P	G	F	N	N	G	G	G	G	G	G	G	G	G	G
Field Pennycress	P	P	G	F	N	N	G	G	P	G	G	G	G	G	F	G
Shepherdspurse	P	P	F	F	N	N	G	G	G	G	G	G	G	G	G	G
Yellow Rocket[2]	P	F	F	G	N	N	F	*	F	G	G	F	*	G	F	G
Musk Thistle[2]	N	N	P	F	N	N	P	P	P	P	P	P	P	F	P	F
Warm Season Annual Grasses																
Crabgrass	G	G	N	N	G	G	F	F	F	F	F	F	F	G	F	G
Fall Panicum	G	G	N	N	G	G	F	F	F	F	F	F	F	F	F	G
Foxtails	G	G	N	N	G	G	G	G	F	F	F	G	G	G	G	G
Johnsongrass (seedling)	F	F	N	N	G	G	G	G	P	P	F	G	G	*	F	G
Warm Season Annual Broadleaves																
Cocklebur	N	P	G	G	N	N	G	G	P	F	*	G	G	F	F	G
Jimsonweed	N	P	G	F	N	N	F	F	*	F	*	F	F	G	G	G
Lambsquarters	F	F	G	G	N	N	P	G	F	G	G	P	G	G	F	G
Pigweeds	G	F	F	G	N	N	G	G	P	G	F	G	G	G	G	G
Ragweed, Common	P	P	G	G	N	N	F	F	P	F	F	F	F	F	G	G
Ragweed, Giant	P	P	F	F	N	N	G	F	P	F	P	G	F	P	F	G
Smartweed	P	P	G	F	N	N	G	G	P	F	F	G	G	F	F	G
Perennials																
Dandelion	N	N	P	F	N	N	F	*	N	G	P	F	*	G	F	G
Dock, Curly	N	N	P	F	N	N	F	*	P	F	P	F	*	P	P	G
Orchardgrass	F	F	N	N	F	G	*	*	G	F	F	*	*	F	F	G
Plantain	N	N	P	F	N	N	F	*	P	F	F	F	*	G	F	G
Red Sorrel	N	N	P	P	N	N	*	*	G	P	F	*	*	P	P	
Tall Fescue	F	F	N	N	F	G	*	*	P	P	P	*	*	*	F	
Yellow Nutsedge	N	F	N	N	N	N	P	P	N	P	P	P	P	P	F	
Johnsongrass (rhizome)	P	P	N	N	F	G	P	P	N	N	*	P	P	*	N	

This table should be used only as guide for comparing the relative effectiveness of herbicides to a particular weed. Depending on weed size and/or under extreme weather conditions, a herbicide may perform better or worse than indicated.

G = Good F = Fair P = Poor N = None * = Data Not Available

[1]Example of Glyphosate products include Glyphomax, Roundup UltraMAX, and Touchdown IQ.
[2]Biennial plant which emerges in late fall or early spring.