WEED MANAGEMENT IN ALFALFA

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Introduction

Weeds compete with alfalfa for water, nutrients, light, and space. This competition can decrease yields, lower forage quality, increase disease and insect problems, create harvesting problems, and initiate or poison the animals which will consume the forage. Premature loss of alfalfa stands is usually the result of the interaction of the pest complex - diseases, insects, and weeds.

Forage crops such as alfalfa differ from most grain and fiber crops in that the weeds are not seperated but harvested along with the crop. This addition of weeds to alfalfa forage decreases per acre yield, and probably more importantly, will lower forage quality. This decrease is often in the form of lowered protein content and digestibility. Successful weed management in alfalfa is an attainable goal for producers. However, to accomplish this, an understanding of the alfalfa-weed ecosystem is needed. Weed problems can be divided into three categories - annuals, biennials, perennials. Each type has characteristic traits that need to be understood if they are to be controlled culturally or chemically. Annuals are plants that complete the germination, vegetative, and reproductive growth stages in one growing season or year. The terms "summer annual" or "winter annual" refer to the portion of the year in which they grow. Biennials are plants that live during two growing seasons. The first season's growth is vegetative with the second season's growth being vegetative and then reproductive. Perennials are plants that live for more than two years and usually reproduce by seeds and vegetatively. Fleshy taproots, tubers, rhizomes, stolons, bulbs, and bulblets are examples of vegetative reproductive organs.

As a general rule, perennial weeds are more difficult to control because of their multiple reproductive mechanisms. However, the amount of alfalfa yield reduction by weeds will be determined by the individual weed species and when it is growing in association with the alfalfa.

There are two distinct growth stages of alfalfa that must be considered when developing a weed management program. In new seedings, the alfalfa plant acts as an annual and is usually in competition only with annuals during the first few weeks of growth. Cultural and chemical means need to be used that will shift the competitive edge to alfalfa - that is, provide control of the annual weed species.

Established alfalfa stands are composed of perennial plants and may be in competition with both annuals and perennials at some time during the year.

Cultural Practices

New seedings - Several cultural practices can be utilized in new seedings to provide weed control and allow the new emerging alfalfa plants to begin growth without competition from weeds. Some of these practices are (1) liming and fertilizing as soil analysis recommends; (2) seeding well adapted varieties that will provide vigorous early season growth; (3) purchase weed-free seed; (4) control of insects and diseases if applicable; and (5) rotation with other crops. These practices are the same for either conventionally prepared or no-tillage seedings. However, in no-tillage seedings, control of existing weeds will be necessary prior to alfalfa emergence.

Established Stands - The following practices will help to maintain a vigorous, dense alfalfa stand and reduce competitiveness from weeds: (1) maintenance of lime and fertility requirements; (2) proper timing of harvests; (3) control of insects and diseases.

Herbicide Control

The aggressive nature of some weed species will allow them to become established regardless of any preventive measures that have been utilized. Many herbicides are available for alfalfa and will provide acceptable control of most alfalfa weeds in Kentucky.

New seedings - Herbicides used prior to seeding are primarily for control of annual weeds such as large crabgrass, giant foxtail, or chickweed. See tables 1 and 2 for herbicides recommended in Kentucky. Herbicides should always be used in spring seedings and are usually beneficial in late summer seedings because the foxtails and crabgrasses are summer annuals that will germinate and grow with the newly emerging alfalfa to drastically affect the stand and subsequent yields.

Table 1. Herbicides applied prior to planting newly seeded alfalfa in prepared seedbeds.

Herbicide	Amount per acre	Weeds Controlled
Balan 1.5E	3 to 4 qt.	Crabgrass, fall panicum, foxtails, goosegrass, lambsquarters, pigweeds
Eptam 7E	3.5 pts	Crabgrass, fall panicum, foxtails, goosegrass, seedling johnsongrass, shattercane, lambsquarters, pigweeds

Table 2. Herbicides applied prior to seeding in no-tillage alfalfa plantings.

Herbicide	Amount per acre	Weeds Controlled
Paraquat 2E[a]	1 to 2 pt	All existing vegetation. Perennial species may recover and grow.
Roundup 4E	3 pt	All existing vegetation.

[a]A non-ionic surfactant should be added to increase control.

Established stands - Herbicides (Tables 3, 4, 5) can be applied to both dormant and actively growing alfalfa for control of grasses and broadleaves. Recommended rates should be closely followed to prevent alfalfa injury.

Table 3. Herbicides applied to dormant alfalfa.

Herbicide	Amount per acre	Weeds Controlled
Lexone 50W	1 to 2 lb	Chickweed, henbit, jimsonweed, lambsquarters, mustards, pigweeds, purslane, ragweed, shepherdspurse, smartweed, spurge, yellow rocket, crabgrass, foxtails, fall panicum
Lexone 4L	1 to 2 pt	Same as Lexone 50W
Lexone DF	0.7 to 1.3 lb	Same as Lexone 50W
Paraquat 2E[a]	2 pt	All existing vegetation. Some perennials and large annuals may recover and grow.
Sencor 50W	1 to 2 lb	Chickweed, henbit, pepperweed, shepherdspurse, yellow rocket, dandelion, barnyardgrass
Sencor 4	1 to 2 pt	Same as Sencor 50W
Sencor DF	.7 to 1.3 lb	Same as Sencor 50W
Sinbar 80W	1 to 1.5 lb	Chickweed, henbit, lambsquarters, mustard, peppergrass, prickly lettuce, shepherdspurse, yellow rocket, crabgrass, foxtails
Velpar 90W	1 lb	Annual bluegrass, chickweed, dandelion, groundsel, lambsquarter, crabgrass, field pennycress, fleabane, foxtails, pigweed, shepherdspurse, yellow rocket

[a]A non-ionic surfactant should be added to increase control.

Table 4. Herbicides that can be applied to either actively growing or dormant alfalfa.

Herbicide	Amount per acre	Weeds Controlled
Butyrac 200[a]	2 qt	Lambsquarters, pigweed, pennycress, common mustard, ragweed, yellow rocket
Furloe 4EC[b]	1 to 2 qt (Oct.-Jan.)	Chickweed, cress, dodder, purslane, shepherdspurse, smartweed
	2 to 3 qt (After Feb.)	
KERB 50W[c]	1 to 3 lb	Chickweed, orchardgrass, sheep sorrel, quackgrass, mustards, shepherdspurse
Princep 80W[d]	1 to 1.25 lb	Pigweed, chickweed, henbit, pepperweed, lambsquarters, shepherdspurse, field pennycress, yellow rocket
Princep Caliber 90[d]	0.9 to 1.1	Same as Princep 80W

[a]In new seedings spray 2 to 4 weeks after alfalfa emergence.
[b]Apply to new seedings after true leaves of alfalfa have formed.
[c]Alfalfa should have trifoliate leaves formed prior to spraying.
[d]Use the lower rates for stands less than one year old.

Table 5. Between harvest applications of Paraquat 2E[a]

Herbicide	Amount per acre	Weeds Controlled
Paraquat 2E[b]	1 pt	Annual grasses and broadleaves. Suppression of some perennial species.

[a]Applications must be made within 5 days of cutting to prevent alfalfa injury.
[b]A non-ionic surfactant should be added to increase control.

Weed Management Programs

Development of successful weed management programs for alfalfa is the result of the following items. (1) Weed problem - know what weed species are present in your alfalfa that are causing problems. A few curley dock plants might be very evident, but low growing species such as chickweed or henbit could be much more of a problem. (2) Application Options - know and

understand the options available to you with your application equipment. This will determine in some cases the herbicides you can choose. (3) Herbicide options - Select the herbicide that will control your weed species with your equipment. Use only recommended rates to prevent alfalfa injury and follow all warnings and precautions on the label. (4) Cultural practices - These were discussed previously but are an integral part of an alfalfa weed management program.