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Fall harvest management of alfalfa

Stephen K. Barnhart

Iowa State University, sbarnhar@iastate.edu

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Fall harvest management of alfalfa

Abstract

Alfalfa, like most other perennials, is influenced by environmental factors and is genetically programmed to respond to these external factors. Alfalfa's response to shortening days and cooling average daily temperatures may be very strong (very fall dormant--usually cold-tolerant plants) or minimal to nonexistent (nondormant--plants with little or no cold hardiness, such as the annual or tender perennials as horticulturists would call them).

Keywords

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INTEGRATED CROP MANAGEMENT

Fall harvest management of alfalfa

Alfalfa, like most other perennials, is influenced by environmental factors and is genetically programmed to respond to these external factors. Alfalfa's response to shortening days and cooling average daily temperatures may be very strong (very fall dormant--usually cold-tolerant plants) or minimal to nonexistent (nondormant--plants with little or no cold hardiness, such as the annual or tender perennials as horticulturists would call them).

During the cold-hardening process, plants accumulate carbohydrates and proteins in storage organs, such as taproots and the crown in alfalfa. They convert these stored carbohydrates into simpler molecules that may give the cells more "antifreeze" protection, and they lose some cellular water so the cells do not rupture when intercellular fluids freeze. Interestingly, alfalfa's response to drought is very similar to that for cold hardiness. So alfalfa plants are much better off going into the winter under dry compared with wet conditions.

The genetics of a plant or variety determines how strongly it goes dormant, its low-temperature tolerance, and how quickly it breaks dormancy in the spring. Most winter hardy alfalfa plants can withstand soil temperatures between 0° and 4°F without tissue damage. At lower soil and crown temperatures, varieties and individual plants vary in their degree of cold damage. For many years, rapid fall dormancy and slow spring regrowth were considered to be synonymous with cold hardiness--and these varieties were marketed as such. Although fall dormancy and spring recovery rates are somewhat related to cold hardiness, they are not good measures of it. Several states and most alfalfa breeding companies are screening varieties and experimental materials in winter hardiness trials. We will probably have "winter hardiness index" information for many varieties soon. Growth later into the fall and recovery earlier in the spring do translate into higher yield, so varieties probably will have to be evaluated and marketed on both winter hardiness and fall dormancy traits.

The excessive winter injury in alfalfa in northwestern Iowa in recent years may be due to the plants breaking dormancy early so that they were reexposed to cold temperatures. Thus, they were not able to drop back into as strong of a cold dormancy as during the winter and were injured (or killed) by temperatures in the upper teens to low 20s (°F).

Factors That Improve Winter Survival in Alfalfa

- Winter-long snow cover of 4 inches or more
- Winter-tolerant variety
- Two or three summer cut harvest systems with good regrowth between cuttings
- Uninterrupted growth (5 to 6 weeks) during September and October
- All of the last growth of the season left in the field (no cutting or grazing)

- Management of insects (e.g., potato leafhoppers) during the growing season
- Good levels of potassium in the plant
- Young stands or older stands with no root or crown disease

Fall Management Strategies

For the best survival of the stand, attempt to take last summer cut by late August or very early September, and let regrowth stand in the field (no late cut or grazing). If you have not fertilized in the summer, topdress any needed potassium in late August or early September.

Q. Due to summer harvest delays, my alfalfa is knee-high in mid-September. Can I cut it then?

A. The answer depends on whether the field will be saved for hay next year. If the answer is "No," harvest anytime. There will only be a slight reduction in nitrogen contribution to the next crop if last top growth is removed. If the answer is "Yes," the field will be kept for hay next year, then determine whether you need the hay from this mid-September harvest. If the answer is "No," leave the last growth in the field--do not graze in fall or winter. If the answer is "Yes," it is best to wait until at or after the killing freeze (23-24°F) in mid-October to cut. Then leave a 5- to 6-inch stubble.

Q. But I cannot dry hay in October! What is the risk of cutting in mid-September?

A. If you cut in mid-September, alfalfa plants will begin to regrow following the mid-September harvest and to use some of their stored carbohydrates; thus, they will have a relatively low level available when the killing freeze comes. Reduced levels of stored carbohydrates can limit winter survival and inhibit regrowth in the spring. With a low level of stored carbohydrates, even a minor premature spring recovery and freeze-back will severely stress the plants.

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