

# Harvest Management of Alfalfa

Alfalfa is the most important forage legume in Pennsylvania. It is a deep-rooted legume that grows best in moderate to well-drained soils.

Under optimum growing and soil conditions, and with proper management, yields can exceed 7 to 8 tons of hay equivalent per acre. In addition, disease-resistant varieties of alfalfa can be maintained four to five years, sometimes longer depending on cutting management.

## **Harvesting of Alfalfa During the Establishment Year**

During the year of establishment, seedlings need a high level of energy reserves in order to persist through the winter. For spring seedings which are made without a companion crop, two harvests can generally be made the first year, provided there are adequate rainfall and optimum levels of soil nutrients. The first harvest can be made before flowers begin to appear, but waiting for the alfalfa to flower will ensure greater energy reserves in the roots. Alfalfa will generally reach this stage of development between 60 and 70 days after emergence. The second harvest should either be made before September 1, to ensure an adequate buildup of energy reserves for winter, or be delayed until after the first killing frost (24 degree F) in the fall or after mid-October. Occasionally, when the second harvest is made before September and there are good fall growing conditions, a third harvest may be made, but not until there is a definite killing frost. When mid-October or later harvests are made, a high stubble (6 inches) should be left for ground cover to protect the crowns and to catch snow for added insulation.

Spring seedings which are made with a companion crop such as oats, are usually harvested for the first time based on the maturity of the companion crop. Alfalfa harvests made after the companion crop has been harvested should follow the same guidelines as for a alfalfa when seeded without a companion crop.

The spring harvest of a fall-seeded alfalfa crop should be based on plant development and vigor. If the alfalfa plants look vigorous and the roots are well developed, spring cutting can be made at bud to early bloom. If plants are small and poorly developed, it is best to wait until mid-bloom before harvesting.

## **Harvesting Established Alfalfa Stands**

The intensity of cutting management (i.e., the number of cuttings made per year) should be based on the desired quality and life expectancy of the crop. If the goal is to have a long-lived stand, then a longer cutting interval should be considered. If the crop is being grown under a short rotation (three years or less), then more cuttings to maximize forage quality may be desirable.

The first cutting in the spring can be made when the crop is in the bud to early- bloom stage. During the spring there is generally limited environmental stress and the alfalfa crop can normally tolerate early cutting. Harvesting at the bud stage has allowed producers to get more cuttings per year, increase their production, and improve the quality of their forage. However, in order to cut this early, there should be optimum levels of soil pH, phosphorus, and potassium, and plants should be allowed to reach the first- bloom stage at least once during the year.

Cuttings made during the summer (second, third, and fourth cuttings) should be made when the crop is in the bud to early- bloom stage of development. Some producers are attempting to cut when the alfalfa is even less mature than recommended. A cutting interval that is consistently shorter than thirty days can be extremely stressful to the stand because energy reserves cannot be stored in the taproots and crowns. Low energy reserves lead not only to poor regrowth (which results in poor yields), but also to an actual loss of stand—sometimes in one year.

Alfalfa, unlike red clover or birdsfoot trefoil, generally maintains production during short periods of dry weather because of its deep and extensive root system. However, during extended periods of dry weather alfalfa growth is reduced and flowering may occur on short, stunted plants. Cutting during these stressful periods does not weaken alfalfa plants or cause stand reductions. If feed is badly needed, these stands of drought-stressed alfalfa can be controlled grazed. If there is adequate late summer or fall growth, after the alfalfa plants have been drought stressed during the summer, an

additional harvest can be made in the fall with less risk of stand loss than if the alfalfa was not drought stressed.

## **Fall Harvest Management**

During the late summer and early fall, alfalfa plants are preparing for winter by developing cold resistance and storing energy reserves in their roots. Depending on the timing, fall harvest may interfere with this process. Harvesting alfalfa at a time that will allow only a few weeks of regrowth before the herbage is killed by frost will greatly reduce energy reserves in the roots. Harvesting will also remove stubble which catches snow and serves as a layer of insulation from extremely cold air temperatures. Both of these situations increase the risk of alfalfa winter kill.

Winter environmental conditions can aggravate the effects of fall harvesting. Temperatures of 5 degree F will injure alfalfa crowns and roots. Soil and snow serve as insulation between the alfalfa plant and cold air temperatures. Lack of snow increases the risk of winter kill. Wet soils will freeze and thaw more intensively which will increase the amount of frost heaving. Don't fall harvest fields that have a history of frost heaving or accumulating little snow cover.

Risks to stand persistence can be minimized by:

1. Taking at least one harvest during the summer at 1/10 bloom or greater.
2. Fall harvesting young stands because young stands are less susceptible to winter injury.
3. Maintaining high soil fertility levels.
4. Fall harvest alfalfa varieties that have good disease resistance and winterhardiness.

Although fall harvesting increases the risk to stand loss compared with not fall harvesting, the need for forage or the value of the forage may be greater than the risk. Making the decision to cut in the late summer or fall requires weighing the risk of winter injury against the need for the forage.

Optimum levels of potassium in the soil enhance the storage of energy reserves in alfalfa roots. High reserves of energy in the roots as winter begins improve the ability of alfalfa to overwinter and support good spring growth. It is important that adequate

potassium be available during the late summer and early fall since the storage of energy reserves for winter survival occurs during this time. Applying potassium fertilizer after the plants go dormant for the winter does not benefit energy reserve storage.