

Alfalfa

Introduction

Alfalfa (*Medicago sativa*) has the highest yield potential and highest feeding values of all adapted perennial forage legumes. It is a versatile crop that may be used for pasture, hay, silage, green-chop, pellets, cubes, soil improvement, and soil conservation.

Marketing and Market Outlook

Alfalfa is the most important forage legume grown in the U.S., with more than 250,000 acres grown in Kentucky each year. Nearly all the hay grown in-state supports the beef, dairy, and horse industries in Kentucky and surrounding states. In addition, an increasing amount of alfalfa is being used by the sheep and goat sectors.

Alfalfa has potential for the cash hay market and for intensive grazing. A diversified marketing plan is advisable, especially for growers producing alfalfa primarily for the premium cash hay market. Some cuttings may prove to be unacceptable for premium markets; those lots will have to be marketed through other outlets or used on-farm. High quality alfalfa hay can be extremely profitable for producers willing to put in extra management time and capital.

Production Considerations

Cultivar selection

Choosing the proper cultivar is a critical step to establishing a good stand of alfalfa. Cultivars vary in terms of quality, yield potential, winter hardiness, stand longevity,



and pest and disease resistance. Select adapted cultivars with a history of producing high yields over a number of years and in a range of locations throughout the state. Refer to University of Kentucky alfalfa variety trial results for more information on cultivar performance. Multiple cultivars can be used in large acreages.

Site selection and planting

Establishing a good stand of alfalfa, whether for hay or for grazing, is expensive and time-consuming. However, the success rate is high if special attention is given to important management factors. A good, properly managed stand of alfalfa should last five years or longer.

The ideal alfalfa soil is deep and well-drained. Although less-than-ideal soils can be used for alfalfa production, lower yields and a shorter stand-life can be expected. Alfalfa stands can be established using conventional tillage or no-till. Tilled seedbeds should be firm with sufficient moisture for rapid germination. No-till alfalfa requires that the sod or other vegetative cover be dormant or dead prior to seeding.



Seed is usually sold pre-inoculated and coated with an inert protective material, such as lime. However, if seed has not been inoculated or the inoculant has been damaged, fresh inoculant, along with a sticking agent, should be applied just prior planting. Seed should be sown in early spring after the danger of late freezes has passed. If seeding in late summer, plants will require 6 to 8 weeks to germinate and grow before the first hard freeze. Sclerotinia crown rot infections and a lack of adequate soil moisture are potential concerns with late summer plantings. Alfalfa can be seeded as a pure stand or mixed with an adapted grass.

Pest management

Alfalfa weevil and potato leafhopper are the most important insect pests of alfalfa. Other potential insect problems include meadow spittlebugs, aphids, clover root curculio, three cornered-alfalfa hoppers, and grasshoppers. Potential disease problems include anthracnose, fungal leaf spots, spring black stem, and several fungal crown rots, including Sclerotinia. Phytophthora root rot can be problematic on poorly drained sites. Disease and insect management relies heavily on using resistant varieties, scouting, and employing sound agronomic practices.

Weeds can drastically reduce alfalfa stands unless controlled. A dense, vigorous stand of alfalfa will out-compete weeds: however, management will become especially important during establishment and later as the stand ages and thins. Herbicides are available that do a good job controlling annual grasses and some broadleaf weeds. Roundup Ready alfalfa varieties are also commercially available.

Harvesting

Spring seedlings should be allowed to grow for 70 to 90 days before the first harvest. The other harvest that year should be made at the early bloom stage. For established stands, the first cutting is made at the late bud stage or when the first flowers open, with successive harvests at early bloom or at 30- to 38-day intervals. To

provide alfalfa plants with the rest period they need in preparation for winter, the last summer cutting should be made before September 15.

Labor requirements

Total labor needs for hay production, cutting, and baling is approximately 12 hours per acre.

Economic Considerations

Initial investments include land preparation, purchase of seed, and stand establishment. Total variable costs for an established stand of alfalfa produced for cash sale as hay in 2013 is approximately \$450 per acre assuming nutrient removal rates and estimated spring fertilizer prices. Presuming a harvest of 5 tons of hay sold at \$150 per ton, returns above variable costs are estimated around \$300 per acre. Machinery and equipment costs are also significant for most producers and would likely add another \$100 or more to costs per acre. A break-even price near \$90 per ton would be needed to cover variable costs and a price greater than \$110 per ton would likely be needed to cover variable and fixed costs of a 5-ton per acre harvest.

Enterprise costs are greatly reduced when alfalfa is produced for grazing. Since a significant portion of the cost of producing alfalfa hay is the machinery and equipment, this cost can be eliminated, or certainly minimized, in a total grazing system.

Selected Resources

- Alfalfa – The High Quality Hay for Horses (University of Kentucky et al., 2005)
[http://www.alfalfa.org/pdf/Alfalfa%20for%20Horses%20\(low%20res\).pdf](http://www.alfalfa.org/pdf/Alfalfa%20for%20Horses%20(low%20res).pdf)
- Forage Decision Aids (University of Kentucky, 2005)
<http://www.ca.uky.edu/agecon/index.php?p=566>
- Forage Enterprise Budgets (University of Kentucky, 2006)
http://www.ca.uky.edu/cmsspubsclass/tiny_mce/jscripts/tiny_mce/plugins/filemanager/files/adreum/budgets/ForageEnterpriseBudget.xls

- Forage Extension Web site (University of Kentucky)
<http://www.uky.edu/Ag/Forage/>
- Forage Variety Trials (University of Kentucky)
<http://www.uky.edu/Ag/Forage/ForageVarietyTrials2.htm>
- Grazing Alfalfa, ID-97 (University of Kentucky, 2001)
<http://www.ca.uky.edu/agc/pubs/id/id97/id97.htm>
- Growing Alfalfa in the South (University of Kentucky et al., 2009) *4.9 MB file*
<http://www.alfalfa.org/pdf/alfalfainthesouth.pdf>
- Improved Grass Legume Hay Enterprise Budget Decision Aid (University of Kentucky, 2005)
http://www.ca.uky.edu/cmcpubsclass/tiny_mce/jscripts/tiny_mce/plugins/filemanager/files/adreum/budgets/archiveddecisiontools/improvedhaybudget3.xls
- Kentucky Integrated Crop Management Manual for Alfalfa (University of Kentucky, 2011)
<http://www.uky.edu/Ag/IPM/manuals/ipm1alf.pdf>
- Rotational Grazing, ID-143 (University of Kentucky, 2011)
<http://www.ca.uky.edu/agc/pubs/id/id143/id143.pdf>
- Understanding Forage Quality (University of Kentucky and American Farm Bureau Federation, 2004)
<http://www.uky.edu/Ag/Forage/ForageQuality.pdf>
- Organic Alfalfa Production (ATTRA, 2003)
<https://attra.ncat.org/attra-pub/summaries/summary.php?pub=88>

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Photos by Keith Weller, USDA-ARS (alfalfa flower) & Gerald Holmes, Valent USA Corp. (alfalfa planting) courtesy Bugwood.org

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