

ALFALFA INSIGHTS

VIRENXIA'S NEWSLETTER ON ALFALFA, THE QUEEN OF FORAGES

ALFALFA MAKES SENSE!

THE FORAGE'S NUTRITIONAL, ECONOMIC,
AND CONSERVATION BENEFITS ARE UNRIVALLED

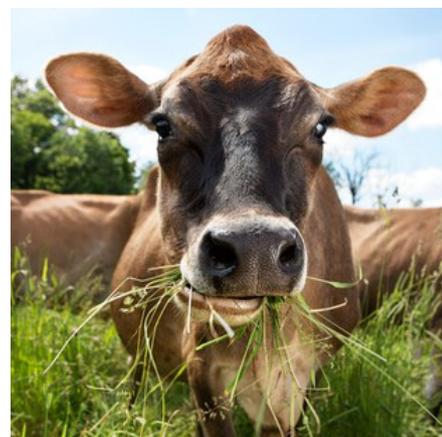
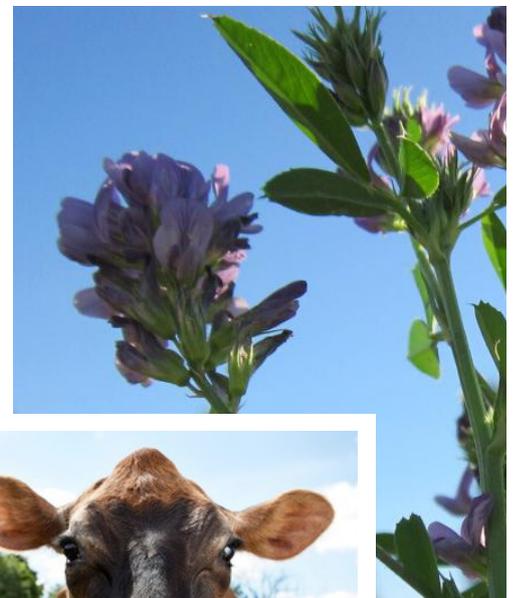
1 Nutritional Sense

Low fiber - Low fiber content of alfalfa maximizes a cow's daily dry matter intake while still meeting the animal's rumen fiber requirements. Each additional pound of intake translates directly into increased milk production.

Protein - Protein is the largest supplemental expense on most dairy farms. Because alfalfa is high in protein, optimal use of alfalfa in the ration can reduce purchased supplement expenses.

High potassium - Dairy cattle need large quantities of potassium. Alfalfa supplies much of the requirement.

High calcium - Alfalfa provides more calcium per ton than any other forage or grain. High milk production requires large amounts of calcium. More protein per acre—Alfalfa produces at least 3 times more protein per acre than other crops. Because protein remains the highest priced nutrient, alfalfa in the ration can significantly improve cash flow.



2 Economic Sense

Increased profits from alfalfa - Top dairy-men know alfalfa is their most profitable crop. The high yield of high quality forage results in the greatest milk or meat production per acre of any forage. Alfalfa is cost competitive with corn silage on a dry matter basis. Check any farm management records program and see that alfalfa has been the most profitable crop when compared to other commodity crops over a number of years.

Alfalfa benefits cropping systems - Alfalfa reduces nitrogen fertilizer expense for most succeeding crops and provides a 10% to 15% yield boost to corn following alfalfa. Alfalfa also helps break disease and insect cycles for other crops, thereby reducing yield losses and/or the need for insecticides.

Higher yields per acre - Improved varieties and better management tools continue to increase yields of alfalfa.

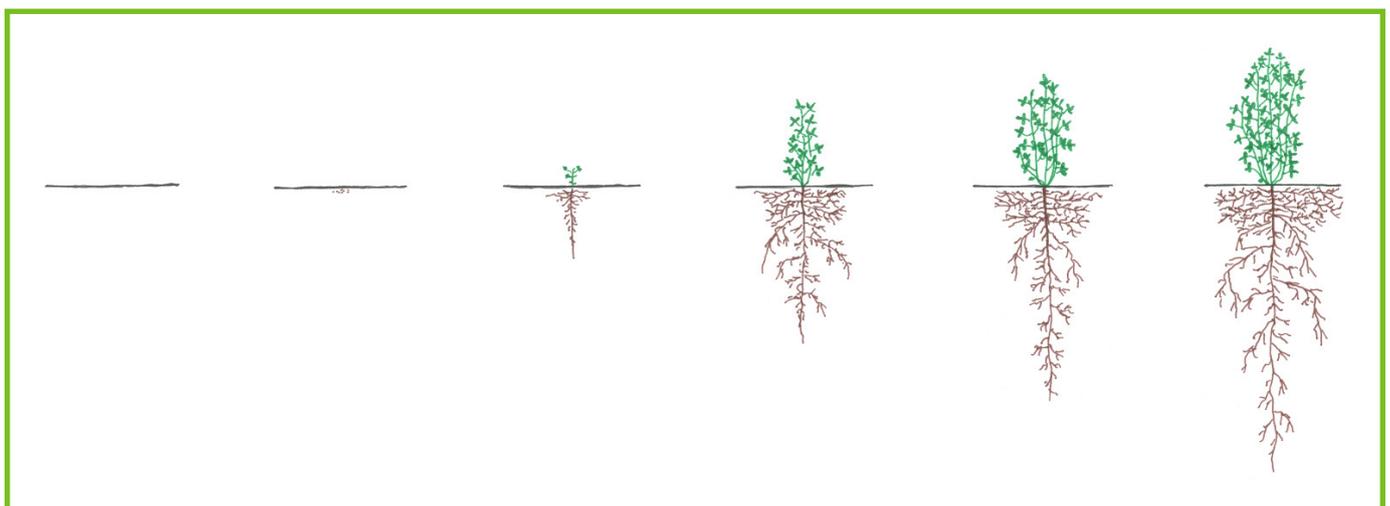
3 Reduced Risk

Reduced risk - Alfalfa is a rugged crop. Improved winterhardness and disease resistance of new varieties continue to enhance its ability to grow and survive difficult conditions. Alfalfa also offers the opportunity for several cuttings during the year—bad conditions for one period don't ruin the entire year's forage supply.

Better production under droughty conditions - With its deep root system, alfalfa will continue to grow and produce more yield under moisture stress than most other crops. Alfalfa begins to regrow once moisture conditions improve while most grain crops suffer irreversible yield loss.

A dependable crop for grazing - Grazing alfalfa or alfalfa-grass mixtures provides high quality forage well into the dry portion of hot summer months. New grazing-tolerant alfalfa varieties combined with improved winterhardness will help extend persistence of alfalfa under grazing—reducing production costs over other less drought tolerant legumes and grasses.

Source: National Alfalfa Alliance, USA



Alfalfa Root Development

4 Conservation Sense

Reduced soil erosion and runoff - Alfalfa is recognized as an excellent ground cover. Alfalfa reduces soil erosion and also reduces runoff of phosphorus and pesticides into streams and lakes. Alfalfa is one of the best crops for trapping nitrogen before it gets into groundwater due to its deep root system which extends below the shallow root-absorption zone of most other crops.

Added manure management options - Alfalfa provides opportunities for manure application several times a year. This helps producers spread their workload and minimize storage facilities.

Improved soil health - Since alfalfa is a perennial crop that lasts several years, only a portion of a grower's entire acreage needs to

be seeded each spring. In many areas alfalfa can be seeded in the summer after canning crops or short season small grain crops, reducing the need to seed alfalfa into wet fields in early spring. Absence of tillage during the life of the stand reduces the breakdown of soil structure compared to annually tilled row crops.

Wildlife benefits - Alfalfa is an incredible home for many insects that are beneficial, and that prey on other insects, produce honey, and serve as a food source for birds. Alfalfa attracts many birds and small mammals to feed and nest because it provides ground cover for a long season.

GLOBAL ALFALFA HAY MARKET

A GROWING MARKET

The global alfalfa hay market was valued at USD 799.9 million in the year 2016 and is expected to record a steady CAGR of 4.9% during the forecast period from 2018 to 2023.

North America, particularly the United States, dominates the alfalfa hay exports market. Weather conditions in 2017 and the decline in global dairy product prices have largely affected the production of alfalfa hay in the country. Irrespective of the decline of production in the United States, the market for alfalfa is expected to grow as demand in the Asian and Middle Eastern countries continues to rise. Livestock is a major factor responsible for the growth of the global alfalfa hay market. The world food economy is being increasingly driven by the shift in diet and food

consumption patterns towards livestock products. In developing countries, consumption of meat has been growing at 5-6% per annum and that of milk and dairy products at 3.4-3.8% per annum over the past few decades. As per the National Center for Biotechnology Information (NCBI), the annual growth of milk production in developing countries is projected at 2.5% by 2030.

Exporters of alfalfa hay are expected to drive the market ahead of dairy buyers, owing to weak dairy product prices and decreased usage of hay in the milk and dairy production business. The export market is expected to offset the demand for alfalfa hay from the dairy segment. Demand is on the rise in Asian countries like Japan and China,

while government regulations on water conservation in the Middle Eastern countries have resulted in increased demand from the region as well.

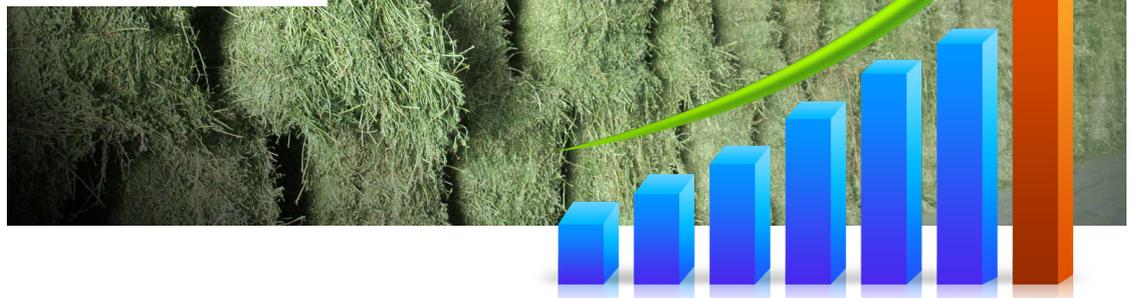
Lower milk prices through 2015 and 2016, coupled with weather-related forage quality issues, caused hay stocks to build and put downward pressure on hay prices. However, the top five importers, consisting of China, Japan, South Korea, the United Arab Emirates, and Saudi Arabia, responsible for buying over 95% of US hay exports, are increasing their import volumes and paying a premium for higher-quality hay, supporting prices at their current levels.

Saudi Arabia's decision to phase out forage production is expected to drive the demand for high-protein alfalfa.

The country wants to severely upsurge compound feed production so that domestic livestock producers have ample quantities of nutritional processed feed at competitive prices. The demand for high-quality alfalfa hay is likely to be about 1.2 million metric ton per year once the transition is complete.

The Alfalfa Hay market size to maintain the average annual growth rate of 2.64% from 25800 million \$ in 2014 to 27900 million \$ in 2017, Research analysts believe that in the next few years, Alfalfa Hay market size will be further expanded, we expect that by 2022, the market size of the Alfalfa Hay will reach 29600 million \$.

Source: *ResearchandMarkets.com*



SITE CHARACTERISTICS FOR ALFALFA PRODUCTION

THE FOLLOWING TABLE PROVIDES IDEAL, MARGINAL, & UNDESIRABLE SITE CHARACTERISTICS FOR ALFALFA PRODUCTION

Characteristic	Unit of Measurement	Ideal	Marginal	Undesirable
Soil texture	-	Sandy loam - Clay loam	Loamy sand, Silty clay	Sandy, Clay
Soil depth	Ft	>6	3-6	<3
Soil chemistry:				
pH		6.5-7.5	5.8-6.3 & 7.5-8.2	<5.8 or > 8.2
EC	ds/m	0-2	2-5	>5
Slope		Nearly Level	Slightly to 12%	>12%
Water Quality				
Ph of Water		6.5 to 7.5	7.5 -8.2	<8.2
EC	ds/m	<1.3	1.3 -3	>3
SAR	-	<6	6-9	>9

Source: From Irrigated Alfalfa management, UC ANR 3512

SOIL DEPTH REQUIREMENT FOR ALFALFA

MOST CROP PLANTS ARE ADVERSELY AFFECTED BY SHALLOW SOILS. ALFALFA IS ONE THAT IS ESPECIALLY SENSITIVE TO SOIL DEPTH.

Most crop plants are adversely affected by shallow soils. Alfalfa is one that is especially sensitive to soil depth. Alfalfa depends on its deep root system to supply water during dry periods. The roots of alfalfa have been observed growing as deep as 30 feet. While it is unlikely that they need to grow that deep, alfalfa roots are capable of effectively utilizing eight feet or more of soil depth. Since water is such a critical factor, the following example is given to show how soil rooting depth can affect the amount of water available to an alfalfa crop. For this example, we will consider a typical silt loam soil following a good rain which saturated the soil. First of all, not all of the water held by the soil is available to the crop. The part that is available is called the available water capacity (AWC) of the soil. We will assume that the average AWC of our soil is 1.8 inches of water per foot of soil depth. If the soil were two feet deep, it would supply 3.6 inches of water to the growing crop. Based on a requirement of 5.5 inches of available water to produce a ton of alfalfa hay,

this soil could produce only 0.65 tons of alfalfa hay per acre. If the soil were eight feet deep, it could supply over 14 inches of water to the crop. This soil could produce 2.5 tons of alfalfa hay per acre.

From this example, it is easy to see why a deep soil has a greater alfalfa yield potential than a shallow soil does. Fortunately, we usually get additional water supplied to a growing crop through rain or irrigation. This helps to reduce the adverse effects of the shallow soils low water supplying capacity. In low rainfall which lead to insufficient water supply, the benefits of a deep soil become apparent. Soil depth also affects the nutrient availability, but not to the same extent that it does water. This is due to the fact that nutrients are concentrated in the surface layer of the soil. still, there are nutrients in the deeper soil layers that are available to alfalfa roots. These may be secondary and minor elements which are needed only in small quantities. A deep soil gives the alfalfa roots a better chance of finding the nutrients they need.

Source:
SOIL AND FERTILITY CONSIDERATIONS FOR GROWING ALFALFA
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