PRECISION FARMING
ALFALFA
WITH JAIN TECHNOLOGY

Alfalfa or Lucerne (Medicago sativa) is a perennial plant that provide green fodder continuously for 3-4 years from a sowing. Being a deep rooted crop, it extracts water from the deeper zone of the soil. It can be raised both as rain-fed or irrigated crop in high water table areas. Lucerne is relished by all kinds of livestock, because it yields nutritious and palatable green fodder, which possesses about 16-25% crude protein and 20-30% fibre. Because it has high protein and vitamin A content, it is also included as a feed component in poultry and piggery. It can also be easily converted into silage and hay. Lucerne supplies green fodder for a longer period because of the option for multiple cut (harvest). In India, Lucerne is cultivated in about 1 m ha mostly in irrigated areas of Punjab, Haryana, Uttar Pradesh, Gujarat, Maharashtra and Tamil Nadu.

Climate

Although a native of temperate regions of south-west Asia, it is successfully grown in most of the tropics. It is a long day plant and performs well in cooler and dry climate. The crop suffers under cloudy, humid and wet conditions. If the high temperatures are accompanied with high humidity, the crop suffers drastically. It can also withstand fairly low temperatures.

Soil

Lucerne can be raised on a wide range of soils. Well drained fertile soils with neutral pH are ideal. It can not thrive on alkaline soil, and on very heavy and waterlogged soils.

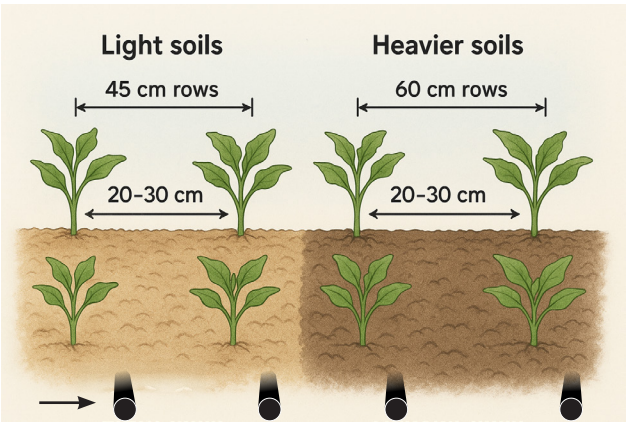
Lucerne needs a fine well levelled seed-bed with adequate moisture.

Requirements

- Seed 25 kg/ha
- Yearly organic manure 20t/ha
- N 20kg/ha , P 60-75 kg/ha, K 40 kg/ha based on soil test.
- Boron deficiency is generally noticed in leached and coarse textured soils. The leaves develop numerous pale-yellow spots leading to disorder known as Lucerne yellow. Spray of 0.2% borax can overcome this deficiency.
- Iron deficiency, leading to chlorosis, is fairly common in poorly drained alkaline soils
- Application of 20 kg/ha each of S and Zn along with 2 kg/ha of Mo may enhance the effectiveness of biological nitrogen fixation.

Crop Spacing

In light soils 45 cm rows and heavier soils 60 cm. Plant to plant spacing may range from 20 to 30 cm.



Jain® Drip More Crop Per Drop®

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Irrigation management

Sub surface drip irrigation (SDI)

Alfalfa requires irrigation. Water requirement is quite high, being 858 litres of water/kg of dry matter produced. A comprehensive study at Kansas State University (Mahbub Alam et al. 1998) has unequivocally proved that SDI is the best irrigation method for Alfalfa.

Why SDI is preferred.

- Subsurface drip irrigation is a viable technology that offers the potential to reduce the amount of water used to irrigate alfalfa.
- Even though Sprinkler or Pivot irrigation can also be used; the scalding of alfalfa leaves that happens under sprinkler irrigation reduces yield.
- The critical stage to meet the water needs of alfalfa is after harvest when the crop starts regrowth. SDI allows irrigation to continue during or right after harvest to encourage quick regrowth.
- Similarly, there is no need to suspend irrigation for a soil dry down period before harvest or while the hay is curing, since the water is applied below the soil surface.
- The lack of surface wetting eliminates evaporation loss and helps reduce the competition from annual weeds that may germinate with surface wetting from sprinkler irrigation.
- The scope of losses due to deep percolation and surface evaporation is greatly reduced in SDI.
- Research from Kansas State University indicates that it is possible to save 25 percent of total water diverted in a season by using SDI.
- Subsurface drip irrigation provides many advantages for growers that far outweigh the limiting factors. We know there is a potential to increase yields by 20-35%.
- Growers can better control fertilizers with fertigation and have the ability to better finesse irrigation schedules with small amounts of water when needed.
- In addition, labor reductions occur due to less weeds.

Placement of Drip lines for Alfalfa

- The drip line (or tape) is to be placed at 20-25 cm below the soil surface and lateral to lateral spacing is 1 m for sandy loam, 1.2 m for loam and 75 cm for sandy soil. The emission rate should be 1 to 2 lph.

Weed Control

- Lucerne takes a long time to establish itself and gives ample scope for weed infestation up to the first cutting.
- First weeding should be done 20-25 days after sowing. Pendimethalin 1-2 kg /ha (pre-emergence) or diquat @ 6-10 kg/ha 5-10 days after sowing effectively controls Cuscuta.
- Pre-sowing application of diuron @ 2.0 kg/ha or fluchloralin @ 1 kg/ha or EPTC @ 3.0 kg/ha or MCPB @ 0.75 kg/ha after 30 DAS or pronamide @ 1.0 kg/ha just after sowing controls the weeds in alfala crop.

Cropping Systems

Alfalfa is usually raised after harvest of kharif crops, such as sorghum, paddy, soybean, maize, cowpea, cluster bean etc. It can be raised in rotation with almost every grain or forage crop. The most common crop rotations are :

- Maize-lucerne , Paddy-lucerne ,
- Greengram-lucerne
- Sorghum (grain)-lucerne-maize (fodder)

Yield

The average green fodder yield of Lucerne varies from 80-120 t/ha. The hay yield ranges from 15-20 t/ha.

Seed Production

Higher seed yields are obtained from plant crop, which is not cut for fodder. In case of established crop, take the last cut of fodder in January. Stop irrigation after full blooming to arrest further vegetative growth and thus ensure good seed yield.

The seed crop should be sown in rows 50 cm apart. Foliar spray of 0.5% borax at pre-flowering stage is found promising for seed production. The harvesting of mature crop should not be delayed to avoid the shedding of pods. Harvest the crop when two-thirds of the pods become dry. The seed yields usually vary from 0.2-0.3 t/ha.

Cost of cultivation (Indian farm)

	Rs/ acre
Land preparation, Seed and planting	4000
Fertilizer	10440
Crop chemicals	1080
Machinery cost	12600
Other expenses	7200
Total per acre	35320

Income generated at the farm

At Rs 10000/ton hay (dried) a yield of 8 ton per acre would give an approximate income of 45,000 per acre per year to the grower.

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