

## FODDER CROPS

### **BERSEEM:**

Berseem (*Trifolium alexandrinum*) is an annual leguminous fodder crop. It is one of the most suitable fodder crop for areas below 1700 m altitude with irrigation facilities. It remains soft and succulent at all stages of growth. It can be grown without irrigation in areas with high water table and under water-logged conditions.

#### **Varieties**

**Meseavi** : it is a fast growing variety and attains plant height of about 75 cm at flower initiation stage. On an average, it gives 500-600 quintals green fodder and 100-125 quintals dry matter yields per hectare in about five cuttings. It contains about 20 per cent crude protein on dry matter basis at early flowering stage.

**BL-1:** This is a long duration variety as compared to the commonly grown variety Mescavi. Because of this, one additional cutting may be obtained from this variety by the end of June. It gives, on an average, green fodder and dry matter yields of 600 and 130 q/ha, respectively.

**BL-22** : This is a long duration variety which gives additional cut during June. It gives, on an average, green fodder and dry matter yields of 750 and 135 q/ha, respectively.

#### **Soil**

It grows well in medium to heavy soil and is tolerant to soil alkalinity.

#### **Preparation of land**

The land should be well tilled, levelled and should be free from weeds.

#### **Manuring**

Apply 25 kg nitrogen and 60 kg P<sub>2</sub>O<sub>5</sub> per hectare. It is advisable to apply farm yard manure at the rate of 50 cartloads per hectare.

#### **Sowing time**

Mid-September or first week of October is the best time of sowing. If the seedling is delayed much in mid-hill zone, the first cutting would be obtained after three months or so.

#### **Inoculation**

If berseem is going to be seeded for the first time in any field, the seed must be inoculated with rhizobium culture which is very essential for its growth.

#### **Method of inoculation**

Prepare 10% *gur* solution and heat it to boiling point and then cool at room temperature. Sprinkle a small quantity of *gur* solution over the seeds to moisten them nicely. Spread thin layer of culture over the *gur* treated seeds and mix thoroughly. Dry the culture treated seeds in shade before sowing.

#### **Seed rate and method of sowing**

Sowing should be done by broadcasting the seed at the rate of 25 kg per hectare in standing water. The seed should be free from seeds of weeds such as *kasni*. This can be done by dipping the seed in one per cent salt solution and decanting-off the floating seeds. If the mixture of Mescavi and tetraploid berseem is not being seeded, 500 g of Chinese sarson seed may be sown mixed with berseem to get higher yield in the first cutting.

Mixture of berseem and oats (50:50 ratio) also gives higher yield. Under *ultra* conditions, seedling should be done 8-10 days before harvesting of paddy.

### **Irrigation**

First irrigation is very important and should be given one week after the seedling. Afterwards, field should be irrigated at an interval of 15-20 days depending upon weather conditions.

### **Yield**

The first cutting is obtained usually 60 days after sowing and subsequent cutting at the interval of 25 to 30 days. In the mid-hill zone during winter, interval between cutting is about 50 to 60 days. In all, 5 to 6 cuttings may be obtained. On an average, nearly 550 quintals of green fodder per hectare may be obtained.

### **Seed production**

The final cutting should not be taken later than the end of February if crop is to be left for seed purpose. *Kasni* and other weeds should be eradicated. Irrigate frequently during the formation and ripening of seeds. On an average, 2.5 quintals seed may be obtained per hectare.

## **SHAFTAL:**

Shaftal (*Trifolium resipunatum*) is an annual leguminous fodder crop suitable for temperate climate and acidic soils where performance of berseem is poor i.e. Kullu, Mandi, Shimla and Chamba districts.

### **Variety**

**SH-48** : It is an improved variety of Shaftal having dark green round trifoliate leaves, hollow thick stem with small whitish flowers on small, compact, spongy head which turns pinkish on maturity. It gives, on an average, 700-800 q/ha of green fodder and 120-130 q/ha dry matter yield in 5-6 cuttings. Its herbage contains 25-27% CP (DM) and is very nutritive for milch animals. Precautionary, it should be grown mixed with oats to avoid chances of bloat in animals. It has low water requirements, therefore, can successfully be grown under rainfed conditions.

**Seed rate** : 15 kg/ha

**Agronomic practices** : As for berseem crop

## **LUCERNE (ALFALFA):**

Lucerne (*Medicago sativa*) is a perennial leguminous fodder crop for unirrigated areas including low, mid and high hills of the State. It has a good vegetative growth almost throughout the year except during heavy rains or when the temperature is near or below freezing point. It enriches and rejuvenates the exhausted soils.

### **Variety**

**Sirsa-9 (Type-9)**: It is the recommended variety of lucerne. It is a quick growing variety attaining plant height of about one meter at early flowering stage. It has green foliage, slender stalks and purple coloured flowers. It gives, on an average, 400-600 quintals green fodder and 80-120 quintals dry matter yield per hectare per year in about four cuttings. It contains, on an average, 22 per cent crude protein on dry matter basis.

**Anand-3** : It has dark green trifoliolate leaves, medium thick stem, deep root system, tillers vary from 10-15/plant, flowers are blue in colour and have quick regeneration capacity. On an average, it provides 400-500 q/ha of green fodder in 5-6 cuttings annually. Its herbage contains 23-24% CP(DM) and is very nutritive.

### **Soil**

Deep and well drained loam & soils are best for this crop. It is very susceptible to acidic soil, therefore, it cannot be grown in soil with pH below 6.5 unless lime is applied. Liming should be done after getting soil samples analyzed for pH one month before seeding.

### **Manuring**

Basal dressing of 25 kg N and 60 kg P<sub>2</sub>O<sub>5</sub> per hectare should be given at seeding time. If soil is acidic, lime based on soil test should be applied one month before seeding.

### **Sowing time**

Best time of sowing is the first fortnight of October to end of November.

### **Seed rate and method of sowing**

Seeding should be done in rows 40 cm apart at a seed rate of 15 kg per hectare. Because of their hard seed coat, seed should be soaked overnight in water before seeding. Like berseem, it must be inoculated with rhizobium culture, if the seeding is going to be done for the first time in any field.

### **Irrigation**

First irrigation should be applied about a month after sowing. The subsequent irrigations may be given at an interval of 15-30 days depending upon weather conditions. During rainy season, water should not be allowed to stagnate.

### **Yield**

The newly grown crop is usually ready for first cutting in about 2-4 months after the seeding depending upon the altitude. The subsequent cuttings may be taken at intervals of 30 to 40 days. It may give, on an average, 350 quintals green fodder per hectare per year.

### **Seed production**

The lucerne crop, which has not been cut for fodder, gives best seed yield. No cutting should be taken later than January from established crop if it is to be kept for seed purposes. On average, 0.5 quintals seed is obtained per hectare.

## **OATS:**

Oat (*Avena sativa*) can be grown successfully for fodder purpose during the *rabi* season under both irrigated and rainfed conditions. Oat fodder is quite nutritive containing, on an average, 7.6 per cent crude protein at 50% flowering stage and about 14.6 per cent at very early stage of growth. Under adequate irrigated conditions, it may give three cuttings starting from January when green fodder is scarce.

### **Varieties**

**Palampur-1** : It is a medium maturing variety with plant height of about 115 cm at 50 per cent flowering which comes in about 145 days. Leaves are broad and dark green in colour. It has uniform tillering with about 15 tillers

per plant. It gives, on an average, 500 quintals green fodder per hectare. The seed crop matures in about 190 days.

**Kent** : It is an early variety coming to flowering in about 125 days. It has moderate tillering and plant height with medium sized leaves. The seed crop matures in about 180 days. On an average, it gives 360 quintals green fodder per hectare.

### **Soil**

Oat can be grown on all types of soils except on waterlogged ones.

### **Seed rate and method of sowing**

Seeding should be done in rows 25 cm apart at seed rate of 100 kg per hectare. The seeds should be treated with Vitavax 2 g/kg seed to ensure freedom from covered smut disease. Sowing of oats in lines 20 cm apart and broadcasting of pea gives higher green as well as dry fodder yield under rainfed conditions.

### **Sowing time**

The crop should be sown from mid September to mid December.

### **Manuring**

For multiple cutting, basal dressing of 40 kg N and 40 kg P<sub>2</sub>O<sub>5</sub> should be done at the time of seeding and 30 kg N should be applied as top dressing each after first and second cutting.

### **Irrigation**

Three to four irrigations are sufficient. In case of multiple cuttings, field must be irrigated after each cutting.

### **Cuttings**

For single cut plots, optimum time of harvesting is the fifty per cent bloom stage. For multiple cuttings, the first cutting is taken about three months after seeding and subsequent cutting at an interval of 40 days.

### **Seed production**

On average, about 15 quintals seed is obtained per hectare, if no cut for fodder is taken.