



## CULTIVATION OF BERSEEM-THE FODDER KING

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### ABSTRACT

Dairy is an important sector that contributes to the GDP of the country. India has a much larger livestock population, which depends on agriculture to fulfil fodder and feed requirements. The country is facing a shortage of good quality fodder and feeds to achieve the high productivity of the animals. Berseem is a crop that can provide 70 to 100 ton ha<sup>-1</sup> between November to May in 5-6 cuts. The berseem crop is a multipurpose fodder crop that can be utilized for grazing, haylage or silage. The berseem provides 17-22% crude protein and 60- 62% total digestible nutrients for the animals. The scientific cultivation of berseem may help to improve quality and quantity of berseem crop.

### INTRODUCTION

India has a large livestock population, and many crops are grown in India round the year to feed the livestock. A high-quality proteinaceous fodder crop improves growth and development and improves the quality of milk produced. Among the different fodder crops, berseem is a very significant leguminous crop known as “*King of fodder crops*”. It is one of the major winter forage crops in the northern region of India. In India, it is grown in around 2 mha area. The berseem crop has 17-22% crude protein and 60- 62% total digestible nutrients for livestock. The berseem crop, once sown, give 3-6 cuttings for feeding to the animals.

### WHY BERSEEM?

1. Berseem is a major fodder crop during the winter season, which can be utilized for grazing, haylage and ensiling crop with cereals.
2. Berseem fix around 297-400 kg ha<sup>-1</sup> nitrogen in soil (Graves *et al.*, 1996).
3. The berseem crop can improve the properties (physical, chemical and biological ) of the soil.
4. Berseem in rotation helps prevent wind and water erosion.
5. It acts as a shelter for beneficial insects to control deleterious ones.
6. It is rich in protein and low in energy.
7. Best suits as a cover crop in orchards for controlling weeds to enrich the soil nitrogen and organic matter.

### POINTS TO BE CONSIDERED IN BERSEEM CULTIVATION

Berseem is an important crop grown in the *Rabi* season primarily for feeding the milking animals. The important points for berseem cultivation are as follows:

**CLIMATIC AND SOIL REQUIREMENT:** Berseem suits well to the cooler climate with an optimum temperature for crop production, *i.e.*, 18-25<sup>0</sup>C and with a well-distributed annual rainfall of 600 mm.

Berseem can be grown on a wide range of soil, but clay loam soils with neutral to slightly alkaline pH are ideal.

**TIME OF SOWING:** The time of sowing play a crucial role in seed germination percentage, seedling survival, number of cuts and herbage production ability. In north-western parts of the country, which includes Haryana, Punjab and Western Uttar Pradesh second fortnight is considered as an ideal time of sowing. In the Bengal region, November is ideal, whereas, in north-eastern regions, sowing is carried out up to 1<sup>st</sup> fortnight of December. It is important to know that early sowing gives more cuts and higher forage yield than delayed sowing.

**PREPARATORY CULTIVATION AND METHOD OF SOWING:** The crop requires a fine seedbed for its better establishment. A deep ploughing followed by 2-3 harrowing is required to obtain fine tilth for good seed germination. Berseem is generally sown by two methods, dry sowing and wet sowing. Under the dry sowing, seeds are sown in line with the help of seed drill and irrigation is provided later. This method is ideal for seed production purposes. In the wet sowing method, the field is divided into strips of 4-6 meters, and flooding of water (4-5 cm) is done, and then the seeds are broadcasted in the standing water. This method is ideal for rapid establishment.

**SEED RATE AND SEED TREATMENTS:** In normal conditions, the berseem crop can be sown with a seed rate of 25 kg ha<sup>-1</sup>, whereas in early sowing, use 15-20% excess seeds as high temperature may lead to seedling mortality. The seeds may be treated with carbendazim or captan @2 g kg<sup>-1</sup> of seed to overcome seed-borne diseases. The berseem seed may be inoculated with *Rhizobium trifoli* strain @ 2 g kg<sup>-1</sup> of seed and shade dry the seeds to get the benefits of symbiotic association, thereby getting the benefits of nitrogen fixation in the soil.

**NUTRIENT MANAGEMENT:** The field is applied @ 10 tons of FYM per hectare to improve soil health and fertility status. The crop is applied with 20:60:40 kg N:P<sub>2</sub>O<sub>5</sub>: K<sub>2</sub>O per ha is applied as basal dose for quick growth and establishment of the crop. After each cut, 10 kg nitrogen per hectare is recommended for the regeneration of the crop.

**WATER MANAGEMENT:** Berseem requires 700-800 mm water. It needs around 16-18 irrigations with an interval of 10-12 days from October to February whereas, during March-April, the irrigation requirement will be within 8-10 days.

**WEED MANAGEMENT:** Weed management in the early stage of the crop is crucial for better crop establishment. Chicory is a major weed in berseem. The intensity of chicory can be minimized by treatment of seed with 10% salt solution by which seed of berseem can be separated from chicory and other weed seeds. Deep summer ploughing with soil inversion plough after the final harvest of the crop is recommended to reduce weed intensity. Again, pre-plant incorporation of imazethapyr @ 0.10 kg /ha is effective to control the weeds.

**HARVESTING AND YIELD:** The first cut of berseem can be taken at 50-55 days after sowing, and the subsequent cuts are taken at 30-40 days intervals. The crop may be left for seed production after the third cut. It can produce 100-120 ton ha<sup>-1</sup> green fodder under good agronomic practices with favourable weather conditions.

## MAJOR VARIETIES

**Mescavi:** This variety was introduced in India from Egypt in 1970. This variety is recommended to grow in the entire country and have a faster regrowth and broader adaptability. It has the potential to produce 70 ton ha<sup>-1</sup> green fodder yield.

**Pusa Giant:** The variety was released by IARI in 1975. It is recommended to grow in the entire country and be tolerant to frost and have winter hardiness. It produces around 67.5 ton ha<sup>-1</sup> green fodder yield.

**Wardan:** The variety was released by IGFRI in 1982, and it is recommended to grow in the entire country. This variety has the ability to tolerate bacterial wilt and other diseases. It produces 72.5 ton ha<sup>-1</sup> green fodder yield.

**BL 180:** The variety was released by PAU in 2006. It is recommended for cultivation in north-western plains and northern hills. It has resistant stem rot and is photo insensitive in nature. It produces 62.5 ton ha<sup>-1</sup> green fodder yield.

**BL 42:** The variety was released by PAU in 2007. This is recommended to cultivate in the entire country. This variety is having resistant to stem rot. It produces 75 ton ha<sup>-1</sup> green fodder yield.

**HB 2:** This variety was released by CCSHAU in 2014. It is recommended to cultivate in the north-western region, having long duration and resistance to stem rot diseases. It produces 75 ton ha<sup>-1</sup> green fodder yield.

**BL 44:** This variety was released by PAU in 2021. It is recommended for cultivation in the north-western region. The variety has more tillering ability and produces 75-80 ton ha<sup>-1</sup> green fodder yield.

## NUTRITIONAL ASPECTS

Berseem is a very nutritious and palatable forage crop. It is a good source of calcium and phosphorus for animals. On the dry matter basis, it contains crude protein 17-22 per cent, crude fibre 28-32 per cent, crude fat 3-4 per cent, NDF 42-49 per cent, ADF 35-38 per cent, ADL 10-12 per cent, ash 8-10 per cent, cellulose 24-25 per cent, and hemicellulose 7-10 per cent.

## CONCLUSION

The berseem fodder has superior character and good regeneration capacity producing succulent fodder up to 6-7 cuts, which can be used for grazing, haylage or silage preparation. The scientific cultivation of berseem may play a significant role in improving the quality and quantity of the berseem crop and meeting the quality fodder needs of livestock.

## REFERENCES

- Kumar, S., Agrawal, R. K., Dixit, A. K., Rai, A. K., Singh, J. B., and Rai, S. K. 2012. Forage production technology for arable lands. *Technology Bulletin*, 39(9), 255-260.
- Muhammad, D., Misri, B., EL-Nahrawy, M., Khan, S., and Serkan, A. 2014. Egyptian clover king of forage crops. Regional Office for the Near East and North Africa Cairo.



Vijay, D., Manjunatha, N., Maity, A., Sanjay Kumar, Wasnik, V. K., Gupta, C. K., Yadav, V. K. and Ghosh, P. K. 2017. BERSEEM-Intricacies of seed production in India. *ICAR-IGFRI Technical Bulletin. Indian Grassland and Fodder Research Institute (IGFRI), Jhansi, UP, India. bit. ly/2EtAm1q.*

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