



## Soybean Production Technology Package and Practices

(\* P. S. Gochar<sup>1</sup> and B.K. Meena<sup>2</sup>)

<sup>1</sup>Post Graduate Institute, MPKV, Rahuri, Maharashtra-413722, India

<sup>2</sup>College of Agriculture, Bhilwara, MPUAT, Udaipur, Rajasthan-311001, India

\*Corresponding Author's email: [prem100499@gmail.com](mailto:prem100499@gmail.com)

World soybean production in 2020-21 is estimated as 353.47 million tonnes from a total area of 136.82 million hectares. Brazil ranks first in soyabean production and India ranks fourth in area with 12.12 million hectares accounting for 8.86% of the world area and fifth in production with 11.23 million tonnes in 2020-21. The major soyabean growing states are Madhya Pradesh, Maharashtra, Rajasthan, Karnataka, and Telangana. According to the first advance estimates 2023-24, Government of India soyabean crop is estimated at 115.28 lakh tonnes as compared to 149.85 lakh tonnes in 2022-23. Among the states, Madhya Pradesh is leading in soyabean production with 45.97 lakh tonnes followed by Maharashtra (45.74 lakh tonnes), Rajasthan (10.69 lakh tonnes).



Soybean (*Glycin max*-L.Merril) also known as Golden Bean or Miracle Crop due to their high protein and oil content. Soybean is a type of legume that originated in China. It was brought to India many years ago across the Himalayan Mountains. It is the most important factor to follow the soybean package of practices to grow a healthy soybean crop. Soybean cultivation is done primarily for its seeds and is India's second largest oil seed after groundnut. Soybean crops have a great nutritional value and contain 40% to 42% high quality protein and 20% to 22% oil. Soybeans also provide 5% of the essential amino acids, carbs, vitamins (thiamine and riboflavin), and minerals.

### Varieties

Commonly grown soybean varieties are Ahilya 2 (NRC 12), MACS 124, JS 75-46, Ahilya 1 (NRC 2), Ahilya 3 (NRC 7), Raj Soya-24(RVS 2002-4), NRC-86 (Ahilya-6), JS-9305, Phule Kalyani, JS-2098, Kota Soya-1 (RKS-113). Other Indian varieties include Ankur, Alankar, Gorav, T-49, and Punjab-1.

### Soil and Climate requirement

For soybean planting, it requires well-drained, fertile loamy soils with a pH range of 6.0 to 7.5 are ideal for soybean cultivation. Soybean seed germination is inhibited by saline and sodic soils. Water logging harms crops, therefore effective soil drainage in soybean farms is essential throughout the rainy season. Soybean crops require temperatures ranging from 15<sup>0</sup>–32<sup>0</sup> C for germination, although 25<sup>0</sup>-30<sup>0</sup> C is ideal for growth. The soybean cultivation requires 60-65 cm of annual rainfall. Drought during flowering or just before flowering leads to flower and pod drops, whereas showers during maturity reduce grain quality.

## Land Preparations

Cultivation of soybean crops starts with deep *summer* plough, followed by levelling of the field. Make ridges and furrows with proper spacing as mentioned above. Sow the seeds with seed-drill with proper spacing. Apply basal fertilizers and give a light irrigation.

## Seed Rate & Spacing

The optimum seed rate of 70-80 kg/ha with a spacing of 30-45 cm, which can be reduced with the use of broad-bed-furrow/ridge-furrow.

## Time of Sowing

Optimum time of sowing is from last week of June to the first week of July subject to availability of soil moisture/rainfall.

## Method of Sowing

Treat the seeds with Carbendazim or Thiram @ 2g/kg of seed 24hrs before sowing to reduce the seed borne fungal infection. Line sowing by seed drill followed as it needs less seeds/ha, weeding and hoeing may be done conveniently.

## Irrigation Schedule

Irrigation is not required for Kharif crops. However, throughout the summer, the soybean planting has been done with guaranteed irrigation, it requires 5-6 irrigations. To save water, the soybean crop should be irrigated at the following critical growth stages for soybean planting are as follows.

1. The germination stage
2. The flowering pod initiation and bean filling stages are critical for yield.

## Usage of Manures & Fertilizers for soybean cultivation

FYM: – 10-15t / ha, N: -20-30 kg / ha, P: -60-80 kg / ha K:- 40-60 kg/ha.

Apply 10 packets of Rhizobium (2000 g/ha) and 10 packets (2000 g) of Phosphobacteria with 25 kg of FYM and 25 kg of soil before sowing. Dry the bacterial culture treated seeds in shade for 15 minutes before sowing.

## Inter Cultivation Practice

Weeding- The crop should be kept weed free up to 60 days after sowing (DAS). One or two hoeing with two hand weeding (20DAS and 40DAS) are sufficient for higher yield. Among weed control, pre-emergence application of pendimethalin @ 0.75a.i/ha and one hand weeding at 40 DAS registered higher seed yield

## Crop Protection- Pests

Bihar hairy caterpillar: *Spilosoma obliqua*,

Gram pod borer: *Helicoverpa armigera*

## Management

- Avoid soybean planting during pre-monsoon
- Use the healthy seeds for soybean planting.
- Gather and discard the infected plant parts, egg masses, and immature larvae.
- Install one light trap per hectare to catch adults of nocturnal pests such hairy caterpillars. Setting up light traps (1 light trap per acre) to control the moth population. Install pheromone traps at a distance of 50 m at a rate of 5 traps/ha
- Spray Chlorpyrifos 20 EC @ 1.5 lit/ha, triazophos 40 EC @ 0.8 lit/ha, or quinalphos 25 EC @ 1.5 lit/ha.
- Dust with chlorpyrifos 1.5% DP, fenvalerate 0.4%, or quinalphos 1.5% at the rate of 25 to 30 kg/ha.

## Diseases of soybean

Anthraxnose/pod blight: *Colletotrichum truncatum*

Charcoal rot, ashy or stem blight or dry root rot: *Macrophomina phaseolina*

Collar rot / Sclerotial blight: *Sclerotium rolfsii*.

## Management

- Clean plough the field soon after the harvest to eliminate all plant residue.
- Remove the diseased stubble from the previous year.
- Seed treatment with Thiram, Captan, or Carbendazim at 3 g/kg, and spray with Mancozeb at 2.5 g/l or Carbendazim at 1 g/l.
- Remove previous year infected stubble.
- Before sowing, treat the seeds with *Trichoderma viride* at 4g/kg, *Pseudomonas fluorescens* at 10g/kg, or carbendazim or thiram at 2g/kg.
- Drenching the infected spot with Carbendazim 1g/lit or *P. fluorescens* / *T. viride* 2.5 kg/ha with 50 kg FYM.
- Spray Mancozeb @ 2g/L or Carbenzadium (500 mg/L).

## Harvesting & Threshing

Soybean will be harvested at the proper stage using the standard procedure as per Package of practices for Soybean. The beans contain 45-55% moisture when mature (filled) and start dropping their leaves. When the plants reach maturity, the leaves turn yellow and drop and soybean pods dry out quickly. There is a rapid loss of moisture from the seed. At harvest the moisture content of the seeds should be 15 per cent. Harvesting can be done by hand, breaking the stalks on the ground level or with sickle. Threshing can be done either with the mechanical soybean thresher or some conventional methods used in other legumes. Threshing should be done carefully and any kind of severe beating or trampling may damage the seed coat and thus reduce the seed quality and viability. A moisture content of 13 to 14 percent is ideal for threshing with thresher

## Yield

After following a proper package of practice of soybean we can get the yield upto 25-30 qt/ha under irrigation condition and 15-20 qt/ha under rainfed condition.

## References

1. [https://www.nfsm.gov.in>Package&practices\\_OS2018](https://www.nfsm.gov.in>Package&practices_OS2018)
2. <https://agritech.tnau.ac.in>pulses>
3. Raghuvver M. *et al.* 2024. Influence of Mechanization on Yield and Economics of Soybean, *Environment and Ecology* 42 (1A) : 335—340
4. Soybean outlook January 2024, *Agricultural market intelligence center*, PJTSAU 1-4.
5. Sinha,A and Parganiha, O.P. 2023. A study on adoption of recommended practices in soybean cultivation among the farmers of Rajnandgaon district of Chhattisgar, *The Pharma Innovation Journal*, SP-12(10): 201-204.