

## SOYBEAN (Glycine max (L.) Merrill.)

### LOCAL NAME:

MONPA : LEVEE

HINDI: SOYBEAN

ASSAMESE : GROMAH

**Introduction :** Soybean is a leguminous crop. It is an important pulse crop rich in food value. It is a cheapest and easiest source of best quality protein and fat. It was considered to be a pulse crop. But due to high oil content, it has now been placed in the category of oil seed crop. Soybean improves the soil fertility by fixing atmospheric nitrogen. Soybean is a food that is nearly perfect as cow's milk, but at the same time rich in iron and vitamin-C (When sprouted).

### Composition of Soybean seed:

Sl. No.	Nutrient	Amount (in %)
1.	Water	8.1
2.	Carbohydrates	20.5
3.	Protein	42-44
4.	Oil	20.0
5.	Minerals	4.5
6.	Fiber	3.7

**Economic Importance :** The fruit, seed, oil, oil cakes are economically useful in one way or other. The immature fruits are used as vegetables. Milk prepared from soybean seeds is used as cow milk and used for preparation of various products. The soybean is used for making high protein food for the children. Soybean sauce is made from the mature fermented beans. The local people made Chhurpi by fermented soya in Arunachal Pradesh. Chhurpi is the main product of the household of the state.

**Oil:** The soybean contains 18-25 percent oil. The oil is used as cooking medium for manufacturing vanaspati ghee and several other industrial products, such as paints, linoleum, oil cloth printing inks, Soaps, insecticide, disinfectants etc. Lecithin phosphor lipids a by product of oil industry, are used as a wetting and stabilizing agent in foods, cosmetics, pharmaceuticals lathers, paints, plastics, soaps and detergent industries.

**Oil cakes :** The soybean oil cake is used for preparation of biscuits, protein rich bread and other confectionery and bakery, high protein livestock feed. Meal of soybean protein is used for manufacturing synthetic fiber, fighting foam and

**Climate:** Soybean grows well at a temperature of 24.0-27.0c and annual rainfall of 62.5-75cm is ideal for its cultivation. The crop does not grow well if the temperature falls below 10.0c.

**Soil:** Soybean can grow in well drained loam, sandy loam and clay loam soils. The pH should be 6.5-7.0. Acidic and alkaline soils inhibit the germination of the seeds.

**Land preparation:** The seed bed should be well pulverized, free from clods perennial weeds, and well leveled.

**Time of sowing:** Soybean is mainly cultivated as kharif crop and the seed is sown in June to July.

**Seed Treatment:** The seed should be healthy and free from disease. The seed should be treated with Captan- 75% or Thiram @ 3g/ kg of seed. The seed should be inoculated with Rhizobium japonicum strains of soybean culture to overcome the problem of poor nodulation. The seed moisten with ten percent gur/ jaggery ( dissolving 100g jaggery in one litre of water ) solution and Rhizobium culture @ 5g /kg of seed is added thoroughly. Then the inoculated seeds are to be finished within two hrs of inoculation.

Rhizobium culture if not available at the planting time, the seed should be sown after mixing with soil collected from 15 cm. deep soil of land which is under soybean cultivation for consecutive 2-3 years.

**Seed rate:** For early sowing: 75-100 kg /ha. For late sowing : 100-125 kg per hectare.

**Method of sowing:** In case of line sowing the seeds should be sown in rows. The recommended spacing for soybean is 45-60 cm. for row to row and 5 cm. for plant to plant. The seed should be sown to a depth of 3-4 cm.

**Inter cropping:** Soybean has good scope as intercrop with Maize and other seasonal crops.

**Mixed cropping:** Mixed cropping is also done with companion crops like maize and millets. The seed is sown after mixing with the seeds of companion crop or without mixing by broadcasting method.

### Manure and Fertilizer :

Nutrients	Quantity in kg/ha	Source of nutrient and its quantity (kg /ha)
Nitrogen	25 kg N	Nil
Phosphorous	80 kg P <sub>2</sub> O <sub>5</sub>	DAP- 174 kg
Potassium	50 kg K <sub>2</sub> O	MoP 84 kg

If the seed is not inoculated with Rhizobium culture, urea at the rate of 40 kg/ ha should be applied in 30-40 days after

**Weed management :** Weeds reduced the yield of soybean by 40-45% depending upon the intensity, nature and the duration of weed competition. Hand weeding twice

after 15 and 30 days of sowing keep the field responsibly free from weeds. Chemical control of weeds is also quite effective. The following herbicide has been found effective in controlling weeds.

Sl.No.	Herbicides	Rate (Kg. ai per ha)	Time application
1.	Nitrofen (Tok-E-25)	1.5 - 2.0	Pre-emergence
2.	Alachlor (Lasso)	1.75 - 2.0	Do
3.	2,4-DB	0.2	Post-emergence treatment

**Water Management :** Kharif crop being grown during rainy season usually does not require any irrigation.

**Harvesting :** Soybean matures within 90-145 days according to the variety. The plant is harvested when the leaves turn yellow and finally drops and only the pods remain on the stalk.

**Threshing :** Threshing can be done by beating the dry plants with bamboo sticks or wooden millets or by trampling under the feet of the bullock. The seed can be cleaned by traditional method of winnowing.

**Storage of seed :** The seeds are dried in sun for 2-3 days to bring down moisture content unto 5.0%. The seed are stored in gunny bag with good ventilation. However, there should be high humidity and moisture inside the store house. The seed stored for seed purpose should be treated with Thiram and Captan @ 3.0 – 4.5 per kg of seed. The treated seed should be dried and stored in cool and dry place. The treated seed should never be used for the consumption purposes.

**Yield:** A good crop may produce 30-40 q/ha.

**Varieties:** Characteristics of some important varieties.

Varieties	Plant height (cm.)	Seed Type	Oil (%)	Maturity	YIELD (q/ha)
Bragg	Medium tall (90-100 cm)	Bold, yellow with black hilum	23-25%	110-115	16.25-18.75
Lee	Dwarf (40 cm)	Light yellow in colour with black hilum	23-25%	110-115	15 - 20
Clark-63	Dwarf (70 cm)	Yellow with dull luster and black hilum	18-20%	90-95	25 - 30
Atankar	Medium	Round and yellow with light black hilum.	20-21	120	25 - 35
JS-335*	Medium	Round and light yellow with light black hilum.	20-21	110	20 - 25

\* Variety JS-335 has been tested in Arunachal condition with