



**FACULTY OF AGRICULTURAL SCIENCES AND ALLIED INDUSTRIES**

**Isabgol Importance, chemical composition-origin, distribution, area, production, climate and soil requirements, propagation techniques, planting and after care, training and pruning, nutritional requirements, plantprotection, harvesting and processing**

### **Importance and chemical composition**

- Isabgol or Blonde psyllium (*Plantago ovata*) belonging to the family Plantaginaceae, is important for its seeds and husks which have been used in indigenous medicine for many centuries.
- It derives its name from two Persian words, 'asp' and 'ghol' meaning a 'horse – ear' referring to its characteristic boat-shaped seeds.
- The husk of the seed is economic part and it contains colloidal mucilage mainly consisting of xylose, arabinose, galacturonic acid.
- The husk has the property of absorbing and retaining water and it works as an anti diarrhoeal drug.
- It is beneficial in chronic dysenteries of amoebic and bacillary origin.
- It is also used for treating constipation and intestinal disorders as it works as calorie free fiber food, promoting regular bowel movement.
- The seed has also cooling demulscent effects and is used to cure inflammations of mucous membrane of gastro intestinal and urinary tracts.

### **Origin and distribution**

- It is indigenous to the Persia and West Asia, extending upto the Sutlej, Sind and West Pakistan.

- The plant is also acclimatized well in Mexico and in the Mediterranean regions.
- It has been introduced in India and cultivated specially in Gujarat and some parts of Rajasthan.
- At present Isbgol has acquired the place of 'dollar earner' crop of North Gujarat.

### **Area and production**

- Isabgol is cultivated in about 50,000 hectares in India, with major areas falling under Gujarat and Rajasthan. The estimated annual production of isabgol is 50 metric ton and India earns foreign exchange valued up to Rs.80 crores every year through export of psyllium husk.

### **Varieties**

- Gujarat Isabgol-1 and Gujarat Isabgol -2 are the two varieties of this crop released by Gujarat Agricultural University. Another variety, 'Niharika', a mutant has been released by the CIMAP, Lucknow, as a high yielding variety.

### **Soil**

- It is an irrigated crop which grows well on light soils. Soil with poor drainage is not conducive for good growth of this crop. A silty-loam soil having a soil pH from 4.7 to 7.7 with high nitrogen and low moisture content is ideal for growth of plants and high yield of seeds.

### **Climate**

- Isabgol thrives well in warm- temperate regions. It requires cool and dry weather & is sown during winter months. Sowing during first week of November gives best yields. Early sowing makes the crop vulnerable to downy mildew disease, whereas late sowing provides lesser period of growth in winter along with possibility of shattering of seed due to summer

rains in April-May. At maturity, if the weather is humid, its seeds shatter resulting reduction in yield. Heavy dew or even a light shower will proportionately decrease the yield, at times leading to even total loss of the crop. The temperature requirement for maximum seed germination is reported to be 20 to 30°C.

### **Land preparation**

- Field must be free of weeds and clods. The number of ploughing, harrowing and hoeing depends upon the soil conditions, previous crop and degree of weed infestation. The recommended dose of FYM (10-15t/ha) is applied to the field at the time of last ploughing. The field should be divided into suitable plots of convenient size, depending upon the texture of the soil, the slope of the field and quantum of irrigation. For light soil with even contour, plot size of 8.0 m x 3.0 m will be convenient.

### **Seed sowing**

- To obtain high percentage of germination, seed should be taken from the crop harvested at the end of the preceding crop season. Old seeds tend to lose viability under ordinary storage conditions. Seed at the rate of 4-8 kg per hectare is sown after treating it with any mercurial seed-dresser at the rate of 3 g/kg of seed, to protect the seedlings from the possible attack of damping off.
- The seeds are small and light. Hence before sowing, the seed is mixed with sufficient quantity of fine sand or sieved farmyard manure. The seeds are broadcasted because sowing in lines at different spacing does not increase the seed yield. After broadcasting, seeds are swept lightly with a broom to cover them with some soil. Broom however, should be swept in one direction only, to avoid deep burial of the seed for uniform germination. The sowing should immediately be followed by irrigation. Germination begins in four days after sowing. If delayed, it should be stimulated by another watering.

### **Manures and fertilizers**

- The FYM of 10-15 tonnes /ha is applied during land preparation. Isabgol does not require application of heavy doses of fertilizers. A fertilizer dose consisting of 50kg N, 25kg P<sub>2</sub>O<sub>5</sub> and 30kg K<sub>2</sub>O/ha gives maximum seed

yield. The full dose of P and K along with half of the N is given as a basal dose. The second split of N is applied as a top dressing after one month of sowing.

### **Irrigation**

- Immediately after sowing, light irrigation is essential. First irrigation should be given with light flow or shower of water otherwise, with fast current of water most of the seeds will be swept to one side of the plot and the germination and distribution will not be uniform. The seeds germinate in 6-7 days. If the germination is poor, second irrigation should be given. Later on irrigations are given as and when required. Last irrigation should be given at the time when maximum number of spikes shoots up. The crop requires totally 6-7 irrigations for its good productivity in medium sandy soils.

### **Weeding and interculture**

- Periodical weeding and hoeing is required. The medicinal plants have to be grown without chemical fertilizers and use of pesticides. Organic manures like, farm yard manure (FYM), vermi compost, green manure, etc. may be used as per requirement of the species. To prevent diseases, bio-pesticides could be prepared (either single or mixture) from Neem (kernel, seeds & leaves), Chitrakmool, Dhatura, Cow urine, etc.

## **Pests and diseases**

### **Pests**

White grubs and termites damage the crop by cutting off the root which can be controlled by broad casting phorate 10G @10kg/ha. Aphids also attack the crop and can be controlled by spraying 0.2% Dimethoate.

### **Disease**

Downy mildew is the major disease caused by *Peronospora plantaginis*. The disease appears at the time of spike initiation. The first symptom is small patches on the leaves, completely destroying it and thus affecting the yield. To control it, Bordeaux mixture or Dithane M-45 or any copper

fungicide at the rate of 2-2.5g/l can be sprayed.

## **Harvesting, processing and yield**

Blooming begins two months after sowing and the crop become ready for harvest in February-March (110-130 days after sowing). When mature, the crop turn yellowish and the spikes turn brownish. The seeds are shed when the spikes are pressed even slightly. At the time of harvest, the atmosphere must be dry and there should be no moisture on the plant, harvesting will lead to considerable seed shattering. Hence, the crop should be harvested after 10 am only.

After two days, they are threshed with the help of tractor during early morning. Water is sprinkled over the heap for easy thrashing and separation.

### **Yield**

Gujarat Isabgol-1, variety yields 800-900 kg of seeds per hectare. The new variety 'Gujarat Isabgol-2' has a potential to yield 1,000 kg of seeds per hectare.