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## Isabgol: The Anti-diarrhoeal drug

Yellapu Rammohan<sup>1</sup>, Chowdam Leelavathi<sup>2</sup><sup>1</sup>PhD Scholar, College of Horticulture, Anantharajupeta,

Dr.YSR Horticultural University

<sup>2</sup>PG Scholar, College of Horticulture, Anantharajupeta,

Dr.YSR Horticultural University

Corresponding author: ram9160s@gmail.com

### Introduction

Isabgol, also known as blonde psyllium (*Plantago ovata*) and a member of Plantaginaceae family, is significant because both its seeds and husks have long been employed in traditional indigenous medicine. It gets its name from two Persian terms, asp and ghol, which relate to the seeds' distinctive boat form and a horse's ear, respectively. The economic portion of the seed is the husk, which includes colloidal mucilage mostly composed of xylose, arabinose, and galacturonic acid. The husk's ability to retain and absorb water makes it an effective anti-diarrhea medication. It is useful in amoebic and bacillary chronic dysenteries. As a calorie-free fibre diet that encourages regular bowel movements, it is also used to treat constipation and intestinal diseases. The seed has also cooled demulcent effects and is used to cure inflammations of mucous membrane of gastrointestinal and urinary tracts.

### Origin and distribution

It is native to Persia and West Asia, encompassing as far as the Sutlej, Sind, and West Pakistan. The plant is very well tailored in Mexico and the Mediterranean areas. It was brought to India and is mostly grown in Gujarat and portions of Rajasthan. At the moment, Isabgol has taken the place of North Gujarat's "dollar earner" crop.

### Area and production

I Isabgol is grown on around 50,000 hectares in India, including main regions in Gujarat and Rajasthan. The projected yearly output of Isabgol is 50 metric tonnes, and India receives foreign cash worth up to Rs.80 crores per year from psyllium husk exports.



It is a short-stemmed annual plant that grows to be 10-15 cm tall. On the stalk, leaves emerge alternately. Flowers are on terminal spikes, and the fruit is a capsule. The blooms are little and white. Self-pollinated to a high degree. The capsule is elliptical and 8mm long, and it releases smooth, dull, ovate seeds that are transparent and convex. The seeds are protected by a transparent covering called the husk. The firm, dark red husked seeds

### **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 that thrives on light soils. Poorly drained soil is not favorable to the development of this crop. A silty-loam soil with a pH range of 4.7 to 7.7, high nitrogen, and low moisture content is optimal for plant development and seed output.

### **Climate**

Warm-temperate climates are ideal for Isabgol growth. It needs chilly, dry conditions and is sown in the winter months. The finest yields are obtained by sowing during the first week of November. Early sowing exposes the crop to downy mildew disease, whereas late sowing gives a shorter time of growth in winter as well as the chance of seed splitting due to summer rainfall in April-May. If the weather is humid at maturity, the seeds break, resulting in a lower yield. The recommended temperature range for maximum seed germination is 20 to 30°C.

### **Land preparation**

Weeds and clods must be removed from the field. The number of ploughings, harrowing's, and hoeing's required is determined by soil conditions, preceding crop, and weed infestation. At the time of the last ploughing, the prescribed dose of FYM (10-15t/ha) is administered to the field. Depending on the texture of the soil, the slope of the field, and the quantity of irrigation, the field should be split into suitable plots of manageable size. For light soil with even contour, plot size of 8.0 m x 3.0 m will be convenient.

### **Seed sowing**

Seed should be collected from the crop harvested at the end of the previous crop season to ensure a high percentage of germination. Under normal storage settings, older seeds frequently lose viability. To protect the seedlings against a potential attack of damping off, seed is sown at a rate of 4–8 kg per hectare after being treated with any mercurial seed-dresser at a rate of 3 g/kg of seed.

The seeds are tiny and lightweight. Therefore, a suitable amount of fine sand or sieved farmyard manure is added to the seed before planting. Because planting in lines at various spacings does not boost seed yield, the seeds are dispersed. To softly cover the seeds with dirt after disseminating, use a brush. To prevent the seed from being deeply buried and to ensure consistent germination, the broom should only be swept in one direction. Irrigation should be done right after the sowing. After seeding, germination starts four days later. If it takes longer than expected, additional watering should prompt it.

### **Manures and fertilizers**

During land preparation the FYM of 1015 tonnes/ha is applied. Heavy dose of fertilizers was not required for this crop. A fertilizer dose consisting of 50 kg N, 25 kg P<sub>2</sub>O<sub>5</sub> and 30 kg K<sub>2</sub>O/ha gives maximum seed yield. As a base dosage, the full doses of P and K and half of the N will be given. After a month of sowing, the second split of N is used as a top dressing.

### **Irrigation**

Irrigation is necessary right away after seeding. A mild flow or shower of water should be used for the first irrigation; otherwise, a quick stream of water would sweep the majority of the seeds to one side of the plot, resulting in uneven germination and distribution. In 6-7 days, the seeds begin to sprout. A second watering should be used if germination is weak. Later, irrigations are carried out as needed. The last watering should be applied when the most spikes are emerging. In order for the crop to grow well on medium sandy soils, it needs to have a total of 6-7 irrigations.

### **Intercultural operations**

Hoing and weeding must be done often. The medicinal plants must be cultivated without the use of pesticides or chemical fertilizers. Depending on the needs of the species, organic manures such as farm yard manure (FYM), vermicompost, green manure, etc. Bio-pesticides may be produced from plants such as Neem (kernel, seeds, and leaves), Datura, cow urine, etc. to prevent diseases.

### **Pests and diseases**

By cutting off the crop's roots, white grubs and termites harm the crop, which may be treated by spraying Phorate 10G @10kg/ha. The crop is also attacked by aphids, which may be managed by spraying 0.2% dimethoate.

The main disease brought on by *Peronospora plantaginis* is downy mildew. At the moment of spike commencement, the disease manifests. Small spots on the leaves, which entirely obliterate it and reduce production, are the first signs. Bordeaux combination, Dithane M-45, or any other copper fungicide should be treated at a rate of 2-2.5g/L to control it.

### **Harvesting, processing and yield**

The crop is ready for harvest in February or March (110–130 days after seeding), two months after blooming starts. The crop matures to a golden colour, and the spikes become brown. When the spikes are even slightly squeezed, the seeds fall out. Harvesting will result in significant seed cracking; hence the environment must be dry and the plant should not have any moisture on it. Because of this, the crop should only be picked after 10 am. They are threshed with a tractor's assistance in the morning after two days. Water is sprinkled over the heap for easy threshing and separation.



### **Yield**

#### **Isabgol husk after processing**

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