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Rice Bean (*Vigna umbellata*) Production in India

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Abstract

Vigna umbellata is a warm-season perennial legume with yellow flowers and small edible beans. It is commonly called rice bean. To date, it is little known, little researched and little exploited. It is found in Indo-China, Southern China, Nepal, Bangladesh and India. It is grown in the variety of soil ranging from loamy to sandy loam soil having a good drainage system. Sowing of rice bean is done mainly in the 1st-3rd week of July month. Broadcasting, Dibbling and Kera/ Pora/ Seed drill are some important methods of sowing rice bean. The seed yield of rice bean is about 225 kg ha⁻¹ worldwide.

Introduction

Vigna umbellata is a short-lived perennial legume usually grown as an annual (Dhillon and Tanwar, 2018). Average height of rice bean is 30-100 cm and can be grown up to 200 cm. The leaves are trifoliolate having leaflets 6-9 cm long. The flowers are bright yellow in color which bears fruits. Fruits are cylindrical which bears the seed of 6-8 mm in size. It is found in Indo-China, Southern China, Nepal, Bangladesh and India. In India, Himachal Pradesh, Uttaranchal, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura, Madhya Pradesh and Chhattisgarh are major rice bean growing states (Dahiphale *et al.*, 2017).

Soil

It is grown in the variety of soil ranging from loamy to sandy loam soil having a good drainage system. It grows moderately on poor or light fertile soil. Avoid cultivation in the saline-alkaline soil, sandy or having water-logged soils. Do not grow rice bean in light soils as it causes root-knot nematode problem to the crop.

Popular Varieties with Their Yield

RBL 6 (6 q acre⁻¹ of average yield), RBL 1 (average yield of 6 q acre⁻¹), RBL 35 (average yield of 6 q acre⁻¹), RBL 50 (average yield of 6.5 q acre⁻¹), PRR 2 (average yield of 6 q acre⁻¹), BRS 1 (average yield of q acre⁻¹).

Land Preparation

For rice bean plantation, it requires fine seedbed which is well prepared by the farmer. For good plant standing it requires prepared seedbed. Seed germination is done on fine seedbed and transplanting is done on prepared nursery beds (Arya and Kumar, 2021).

Sowing

As it is a kharif season crop, sowing is done mainly in the 1st-3rd week of July month. It requires row spacing of 30 cm and plant spacing of 10-12 cm. Seed should be sown at depth of 3-4 cm. Broadcasting, Dibbling and Kera/ Pora/ Seed drill are some important methods of sowing rice

bean. For good yield, use seed rate of 10-12 kg acre⁻¹.

Nursery Management and Transplanting

Sow rice bean seeds on prepared beds having convenient length and width. Sow the seeds with the help of seed drill. For higher seed germination sowing is to be done under good water conditions.

Fertilizer

At the time of land preparation, apply well rotten farmyard manure @ 10-15 t acre⁻¹. Apply fertilizer dose of nitrogen @ 6 kg acre⁻¹ (urea @ 13 kg acre⁻¹) and phosphorus pentoxide @ 8 kg acre⁻¹ (single superphosphate @ 50 kg acre⁻¹).

Weed Control

Frequent weeding and hoeing are required to keep the field weed free. 1-2 hoeing are required after 30-50 days of sowing to control the weeds. Mulching is also an effective way to reduce soil temperature along with weed control.

Irrigation

In monsoon, there is no need for irrigation. But when monsoon doesn't occur on time or drought occurs then apply irrigation 2-3 times in the post-monsoon period.

Plant Protection

i) Disease and Their Control

Leaf stem rotten: The disease damages the stem and as a result there is low seed yield and its quality also decreases.

Yellow leaves: The disease appears firstly as a red spot and then gradually it turns into reddish brown and then yellow. It will decrease the leaves yield. Remove the infected portion as early as possible to treat this disease.

Blister beetle: The beetle damages the flower and blocks the pod formation. Spraying of deltamethrin 2.8 EC @ 200 ml or indoxacarb 14.5 SC @ 200 ml or acephate 75 SP @ 800 g acre⁻¹ in 80-100 l of water is given to treat blister beetle pest.

ii) Pest and Their Control

Small larva (hairy caterpillar): The caterpillar damages the leaves and green stems by feeding themselves. Spraying of Ekalux 25 EC @ 200 ml in 80-100 l of water or Nuvan 100 @ 200 ml in 80-100 l of water is used to treat hairy caterpillar.

Pod borer (Lepidoptera): It damages the pod by eating the young seeds or by moving on one pod to another. Spraying of indoxacarb 14.5 SC @ 200 ml or acephate 75 SP @ 800 g or spinosad 45 SC @ 60 ml in 100 litres of water per acre is given to treat pod borer.

Lizard: It causes cuts to the leaves and bunds of the plant. Spraying of pesticide around the plant will help to remain

lizard away from the plants. Spraying must be done in evening.

Larva: It destroys the leaves and pod of the plant by feeding themselves on the leaves and bore in the pod.

Harvesting

Harvesting is mainly done when 80% of pods turn brown in color. Harvesting is done mainly in the morning to avoid upsetting of the pod. The harvesting is done in small patches because the plants are interlinked with each other.

Seed Yield

The seed yield of rice bean is about 225 kg ha⁻¹ worldwide. It can, however, vary from 200-300 kg ha⁻¹ in West Bengal to 1,300-2,750 kg ha⁻¹ in Zambia and Brazil.

Forage Yield

In West Bengal, fodder yields were reported to range from 5-7 t DM ha⁻¹ in May and June, to 8-9 t DM ha⁻¹ in November and December. Lower values have been reported: 5-6 t DM ha⁻¹ in Myanmar.

Post-Harvest

After harvesting, grains are sun dried. After drying they are packed in gunny bags or wooden boxes for long distance transport and for sale purpose.

Conclusion

To date, rice bean is little known, little researched and little exploited. In India, Himachal Pradesh, Uttaranchal, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura, Madhya Pradesh and Chhattisgarh are major rice bean growing states. RBL 1, RBL 6, RBL 35, RBL 60, PRR 2 and BRS 1 are some important varieties of Rice bean. It is a kharif season crop. It requires fertilizer dose of nitrogen @ 6 kg acre⁻¹ (urea @ 13 kg acre⁻¹) and phosphorus pentoxide @ 8 kg acre⁻¹ (single superphosphate @ 50 kg acre⁻¹). Harvesting is mainly done when 80% of pods turn brown in color. The seed yield of rice bean is about 225 kg ha⁻¹ worldwide.

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