

Production of New drought tolerant and Micronutrient Rich Bush Beans

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Introduction

Good agronomic practices contribute about 60% while the genetics of the variety contribute 40% to the potential yield. Therefore, it is very important that farmers follow recommended agronomic practices to achieve high yields and good quality grain.

Land preparation

The field should be well prepared to reduce big soil clods. Hoes, oxen plough and tractors can be used for ploughing.

Fertilizer

Soil analysis is strongly recommended to provide guidelines on fertilizer requirements. Diammonium Phosphate fertiliser should be applied at the rate of one 50 kg bag per acre. If applied in furrows or planting holes, mix the fertiliser and the soil before placing and covering the seed.

Time of planting

Beans should be planted at the onset of rains. Where beans are intercropped they should be planted soon after the maize.

Spacing

- A bean mono-crop should be planted in rows at 50 by 10 cm at one seed per hill.

- In ox-ploughed fields, the distance between furrows is fixed at 60 cm and the distance between plants should be 15 cm.
- In intercropping, plant maize at spacing of 120 by 30 cm, then plant one row of beans between the maize at spacing of 60 cm from maize rows and 20 cm within the row. Plant 2 seeds per hill at a depth of 4-5 cm

Weeding

Weeds reduce yield. This is why it is important to weed at least 1-2 times per season. The 1st weeding should be done 2 weeks after emergence and the second one before flowering. Weeding during flowering or when wet season leads to flower abortion or disease attack.



Weed free bean crop

Harvesting and yields

Harvest beans when dry and spread them out to dry further before threshing. Threshing immediately after harvesting damages the seed because they are moist and soft. Dry the beans on a plastic sheet or gunny bags to keep them clean. After threshing and winnowing, sort and discard rotten, bruchid-infested, off type and damaged seeds.

Disease management

The varieties have moderate tolerance to bean diseases. However, the following management practices are recommended:



Scab disease in beans

Bean common mosaic virus (BCMV)

The disease is portrayed by stunting of plants, deformed leaves, flowers and pods. Remove and discard the infected plants, control vectors such as aphids and plant certified seeds to control/prevent the disease.

Common bacterial blight

The disease appears as brown spots surrounded by yellow zone on leaves, stem and pods and brown/black lesions on grains. Use of certified seeds, crop rotation and seed dressing with chemicals is recommended.

Bean root rot

Infected seedling have reddish/brown lesions on the hypocotyl and primary root 14 days after emergence. Use of clean seed, crop rotation, field hygiene and dressing seeds with chemicals is recommended.

Insect management

The most common insects that affect bean plants are aphids and bean fly.

Bean fly

The adults lay eggs on primary leaves immediately after plant emergence. White maggots and black/brown pupae emerge at the base of the stem. The stem crack at the base, usually followed by yellowing, wilting and death of the seedlings. Control the pest by dressing seeds with systemic insecticides e.g. *Endosulfan* and *Acephate* or others before planting. Spray with chemicals such as *Deltamethrin* 2 weeks after emergence. Practice field hygiene and early planting.

Bean aphid

Aphids cluster on the stem, leaves and pods of beans. They suck sap and this causes stunting. They are usually common during the dry period. They spread plant diseases such as bean common mosaic virus. Control the pest with chemicals such as *Deltamethrin*.

Treatment before storage

Beans intended for storage should be treated in any of the following ways to control weevils:

- Use of non-chemical, hermetic storage technologies such as the triple layer Purdue Improved Cowpeas Storage (PICS) bags.
- Dusting with storage pesticides such as Actellic at a rate of 50 g per 90 kg bag is recommended
- Grains can be further treated with sunflower or corn/maize oil at 200 ml per 90 kg bag.

Bean storage

The grain should be kept clean and dry. Proper drying reduces the chance of mould formation. Store beans in sacks or others containers in a clean, dry and well ventilated place. Make sure that the store has no leaking roof and no rain water running down the walls.

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