

# Mungbean - Recommended Cultural Practices

## Introduction

Grain legumes are concentrated sources of protein and unlike many other crops, they can adapt to nitrogen-deficient soils. Virtually all of the grain legumes fix their own nitrogen through a complex symbiotic process called nitrogen fixation, thereby reducing, in many situations, the cost of nitrogen inputs by farmers.

Like other legume crops in Somalia, mungbean is grown mainly in mix or intercropping with cereal crops such as maize and sorghum. However, there are few commercial farmers who grow mungbean as a sole crop.

## Land Preparation

Growing mungbean after sorghum or maize is best. Avoid planting mungbean after mungbean because disease organisms from the previous mungbean crop may affect the following mungbean crop adversely.

It is recommended to accurately prepare the land prior to sowing. This will facilitate smooth seedling emergence/germination, and better conditions for young seedling growth and development. It is ideal to prepare the field by plowing, harrowing and leveling.

Localised fertilisation with phosphates is recommended. In fact, studies conducted at Bonka Research Station in the late eighties suggest that a lack of plant available phosphorus is a limiting factor for crop growth and yield in many, perhaps most, of the sorghum growing soils in southern regions of Somalia. Therefore, the supply of phosphorus will also increase the absorption of other important nutrients, resulting in a considerable increase of yields.

## Sowing

The majority of the mungbean farmers in southern Somalia start planting the crop before or at the onset of rainfall. This can sometimes have a devastating effect, especially when the first rainfall is not adequate for early seedling emergence and growth, and the subsequent rains disappear for a long period of time. Under these circumstances, the initial rain would likely trigger the seed to germinate, then wilt and eventually die due to lack of water. Because of this, some farmers wait for the first rains to pour down and the moisture to dry up. The first two weeks of April and October are generally the start of the planting time for Gu and Deyr growing seasons respectively.

The seeds are planted randomly in the farm with a few farmers using line/row planting method and applying the appropriate/correct spacing. No seed germination test is conducted before planting. To avoid losses during germination, farmers place more than enough seeds in the planting hole or hill. In case all the seeds germinate, some farmers thin to leave 3-4 plants/hill while others do not thin their crop, leading to overcrowding and competition for resources. In most cases mungbean is intercropped with cereal crops (maize and sorghum), and in rare cases crop rotation is done. Timely planting is important for a) maximum use of first rainfall and suitable temperatures; b) the benefit from nitrogen flush that is available at the beginning of rains; c) faster emergency and vigorous growth, that help the plant to escape pests and diseases; and d) early crop establishment, to better compete with weed species for resources. The seed rate varies with seed size and season. The seed size for the locally grown mungbean is very small. Therefore, 5 to 10 kg seed should be sufficient for one hectare field.

### **Selection of varieties**

Two varieties of mungbean are currently available: one is the local variety and the other is Filsan. The agronomic and yield performance of both varieties are shown in table 1. The data in table 1 was generated from mungbean trials conducted in Afgoi, Jowhar and Jannale during the Gu of 2009.

**Table 1: Vegetative and reproductive growth of Filsan vs. local mugbean grown in Jowhar, Jannale and Afgoi during the Gu 2009 season.**

Variety	Vegetative and Reproductive Characteristics						
	Days to 50% flowering	Plant Height (cm)	Pod Length (cm)	No. of pods/plant	Number of seeds/pod	100 Seed Weight	Yield (kg/ha)
Local	47	71	10	44	11	49	154
Filsan	37	41	11	41	12	63	886

In addition, Filsan has the following characteristics: a) Ggood taste; b) rapid cooking time; c) increased volume after cooking; d) being free from hard grains after cooking (Jowleey); and e) attractive colour and size for marketing.

### **Controlling weeds**

For farmers in the dryland growing areas of southern regions, weed control is the most important field operation activity that is within their control, and they invest in it the greatest portion of their effort. Studies in the Bay Region have revealed considerable diversity across the Region in the severity of the weed problem and in the strategies adopted to handle it. There are two *Launea* species, known as “kable” and “wanshaqaar”, which are the biggest weed problems, followed by “kuuley” grass. Kable is a deep-rooted species and utilizes deeper soil moisture. While hand hoeing can reduce its competition, it fails to destroy the root system, which is a continual source of new shoots. In irrigated area, Kurdo (weed grass) is a serious weed.

Hand weeding using hand hoe (Yambo) is commonly used. At least two weeding are necessary during the season. The first weeding should be done 2-3 weeks after seedling emergence. The second weeding should be done 5-6 weeks after seedling emergence. In the dry season, failure to weed will result in considerable yield losses. Under these circumstances, a single weeding after surface moisture has evaporated and the crop is beginning to draw on deeper stored moisture is as economical as multiple weeding. In the wet season when phosphorus and sometimes nitrogen are the most limiting factors, weeding up to three times beginning early in the life of the crop will increase yields due to reduced competition for nutrients, light, and moisture. The optimum number of weeding may vary from farm to farm and from season to season and is generally a function of soil fertility, soil moisture, and the overall hygiene of the field. During weeding, care must be taken not to injure the roots. Soil should be heaped around the base of the plant in order to: a) cover the root system to avoid overheating and b) offer support anchorage and to prevent lodging.

Loosening the soil while weeding should be a common practice since it facilitates aeration and improves water percolation into the soil, promoting moisture conservation.

In irrigated areas, weeding must follow soon after every irrigation. The river water is full of seed materials of various species. Early weeding is highly recommended. Generally, no irrigation is needed during the rainy season except when drought occurs.

### **Controlling diseases**

Mungbean yellow mosaic virus (MYMV) is the most serious problem affecting mungbean in many countries. Infected plants become chlorotic and stunted. Planting of MYMV-tolerant/resistant varieties is the best control measure.

Powdery mildew (*Erysiphe polygoni*) occurs under cool temperature (20-26<sup>0</sup>C) and is favored by cloudy weather. It can cause up to 40% yield loss. In the early stage the disease appears as light yellowish irregular spots on leaves which turn brown quickly. A powdery mass grows over the spots, covering the entire leaf surfaces.

To control powdery mildew, sow resistant varieties, if available. If sowing susceptible varieties, fungicides may be needed to protect the crop. Fungicide applications may begin three weeks after emergence.

Cercospora leaf spot (*cercospora spp.*) commonly attacks mungbean in the tropics. Cercospora leaf spot (CLS) is recognized by the appearance of leaf spots that are circular to irregularly shaped with grayish white centers and reddish brown to dark brown margins. It can cause yield significant yield losses.

The losses due to CLS disease can be avoided by planting resistant cultivars. Crop debris and weed hosts should also be removed at the time of planting. When susceptible cultivars are planted, spray with fungicides such as chlorothalonil at 2 kg a.i./ha at two-week intervals.



Figure 1: Powdery mildew - *Erysiphe polygoni*



Figure 2: Cercospora - *Cercospora spp*

### Controlling insect pests

Beanfly (*Ophiomyia phaseoli*, *O. centrosematicus*, *Melanagromyza sojae*, and other species) is the most important insect pest of mungbean. It causes significant damage during the seedling stage. The adult flies are too tiny, only 2mm, and cannot be recognized easily. The beanfly maggots feed inside the plant stem and their damage cannot be seen from the outside.

Mungbeans must be protected against beanflies, aphids (especially black legume aphid [*Aphis craccivora*]), pod borers (*Mauca testulalis* and *Ostrinia furncalis*) and Bruchids. Bruchids (*Callosobruchus chinesis* and *C. maculates*), commonly called pulse beetles or cowpea weevils, attach to mungbean both in the field and storage. But the greater losses occur in stored grains. The nutritional quality of the grain deteriorates because of bruchid infestation, rendering them unmarketable.

To control bruchids, clean storage areas properly, dry seeds well, and apply non-toxin chemicals such as vegetable oils. For large-scale storage, fumigation with phosphine or other suitable fumigants can be adopted. Always follow the label directions when using any pesticide.



Figure 2: Melanagromyza



Figure 4: Callosobruchus

Managing of crop diseases can best be obtained by the integration of several control practices. For many diseases, the use of resistant varieties offers the least expensive and best means of control. However, the combination of resistant varieties, seed treatment, removal of diseased plants and crop rotation, if feasible, will provide the best over-all control of sorghum diseases.

### Harvesting

Harvest when pods are mature and dry, but before they start shattering. Manual harvesting is usually practiced in many parts of African including Somalia. Harvest and post-harvest handling can cause significant grain losses. Use appropriate management practices to reduce the losses.