

**Management** - treat seed with an antibiotic prior to planting to reduce levels of bacterium or to kill off bacteria. Spray with an appropriate protective copper-based fungicide before appearance of symptoms

**Fungal diseases** – cause yellowish-brown/tan, irregular, sunken spots with reddish-brown borders (Anthracnose), circular and dark-brown lesions on older leaves (Leaf spot) and minute, yellow, raised spots appearing on both surface of affected leaves(rust)

**Management** - use certified seed, spray with the registered fungicides at first sign of symptoms and repeat 7 – 14 days depending to aggressiveness of infection or prevailing weather conditions, alternating the fungicides. Inter-cropping with cereals and use of 2-3 year rotations with non-legume crops are other preventive options

**-Viruses** – cause dark green sectors on lighter green background accompanied by curling of leaf margins. Severe cases may cause leave distortion and blistering, stunting growth, distortion of flowers, and small pods

**Management:** Use resistant cultivars and control vector

### HARVESTING

Harvest when pods are almost dry but not too dry to shatter in field  
Indicators that beans are ready for harvesting

- Plants will be drying with falling leaves
- Pods turn yellow then khaki/light brown
- Seeds would be hard inside pods & retained its true colour

### HARVESTING PROCESS

- Hand pulling of bean plants & plucking off pods
- Use of machinery

### HARVESTING TIPS

- Harvesting should be done early in the morning
- Mechanized harvesting should be done when there is no danger of rainfall
- Combine harvesting should be done at 18% moisture content

### DRYING (UNSHELLED)

- Spread beans in thin layer on concrete floored /threshing yard /black tarpaulin/polyethylene sheet (black absorb heat & kill bruchids)

### THRESHING AND STORAGE

- Beans can be stored unshelled & treated with lihawu (ideal for small-scale production)

**Threshing** – can be done with moving tractor on pods at slow speed, use bean thresher or thresh in bags (small-scale)

**Drying (shelled)** – freshly threshed beans should be dried for 3 – 5 days (mechanized). After drying, should be cooled in well-ventilated warehouse

**Grading** – remove dirt, foreign material, diseased, weed seed, discolored and split

**Storage** - should be in suitable bins, metal, cement or concrete tanks



## MINISTRY OF AGRICULTURE

# SUGAR BEAN PRODUCTION FACT SHEET



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## INTRODUCTION

Sugar beans are an important food crop in Africa (originate from Latin America); it is grown for both household food security and family income. It is a widely consumed crop and is a good source of proteins (20 – 25%) and dietary fibre. The pods are consumed as green beans and dry seed.

Sugar beans as a legume crop contributes to soil improvement (fix atmospheric Nitrogen into the soil)

Currently, there are bio-fortified varieties; have additional Zinc and Iron that are vital for human body development

## ADAPTABILITY

Sugar beans can be grown in all Agro-ecological regions; provided climatic conditions are favourable during the growth period.

## CLIMATIC AND SOIL CONDITIONS

Sugar beans require warm to cool temperatures and will perform best in full sunlight; they are sensitive to high temperatures and frost

**Rainfall** – optimal – 650 – 750 mm; but with a minimum of 400 mm,

Well-distributed over the growing period, the crop can be sustained.

Beans are sensitive to drought during flowering and pod-set.

**Temperatures** – optimal temperature – 18 – 24°C; temperatures above

30°C during flowering and pod-set cause abortion and blind pods

**Soil conditions** – dry beans require well-drained soils i.e. sandy loam, sandy clay loam or clay loam soils (clay content of 15 – 30%)

The crop is sensitive to acid soils (grow well in pH between 5.5 to 6.5)

## VARIETIES

There are several varieties with varying length of days to maturity a farmer can choose from in the country

### A.PAN 148

Red-speckled sugar bean variety, medium-maturing (takes 100 – 120 days to maturity) with potential yield of 2.0 – 2.5 MT/ha

### B.PAN 9216

Red-speckled sugar bean variety, medium-maturing (takes 100 – 120 days to maturity) with potential yield of 1.5 – 2.5 MT/ha

### C. Kranskorp

Red-speckled sugar bean variety, medium-maturing (takes about 115 days to maturity) with a potential yield of 2.0 MT/ha (2.7 MT/ha under irrigation)

### D. Bio-Nua 45

A red-mottled sugar beans, bio-fortified sugar bean (with 95mg/kg Iron and 38mg/kg Zinc) and dietary fibre; early maturing (takes about 90 days to maturity) with potential yield of 2.4 MT/ha (2.9MT/ha under irrigation)

### E. CAP 2000

Red-speckled sugar bean variety, early-maturing (takes 90 – 100 days to maturity) with potential yield – 2 to 3 MT/ha

### F. LAKE 101

Red-speckled sugar bean variety, early-maturing variety (takes 85 – 90 days to maturity) with potential yield – 1.0 to 1.5 MT/ha

## CULTIVATION PRACTICES

Sugar beans can be produced under conventional or minimum tillage practices. Soil depth should be at least 0.3m

**Land preparation:** Good seedbed, free of weeds with minimal clods are essential for seed germination and early growth stages

**Seed rate:** 60 – 120kg/ha; depending on spacing and agro-ecological zone, planted at 5cm depth

**Spacing:** depend on agro-ecological zone, dry-land or irrigated 45 to 60 cm between rows and 7.5 to 10 cm between plants



**Planting time** – the following are recommended planting times in the kingdom of Eswatini: Highveld; October to February  
Moist Middleveld and Lubombo plateau - Sept/October and January to March  
Dry middleveld and Lowveld – Feb to March and mid-July (under irrigation)

## Fertilizer requirement

Fertilizer requirement is usually determined through soil test results

With no soil test results, this can be used:

**BASAL:** 200 – 300 KG/HA OF 2.3.2(22)

Side dressing: 100 – 150 kg/ha LAN (depending on agro-ecological zone).

Application of side-dress can be done on the onset of bud-formation

**NB:** Beans can fix atmospheric Nitrogen, therefore too much Nitrogen will promote vegetative growth at the expense of productive and further make plants susceptible to foliar diseases



## CROP PROTECTION (WEEDS, INSECTS AND DISEASES)

### WEED MANAGEMENT

Beans planted in a clean seed bed and correct spacing reduce the number of weedings. Beans should be weed free for the first five (5) weeks after planting; first weeding can be done two (2) weeks after planting and second one just before flowering. Weeding at bean flowering should be avoided

Herbicides are also available for the control of weeds. These include pre emergence herbicide e.g. Dual can be applied as (within 3 days after planting) and post-emergence herbicide e.g. Basagran (applied after emergence of weeds and when the plant has developed the trifoliate leaves).

### INSECT PEST MANAGEMENT

A number of insects are known to attack beans and the major ones are:

**-Bean fly (Bean stem maggot)** - Larvae feeds soon after hatching and produce numerous larval mines on leaves just under the epidermis

**-Management** – use seed dressings, cultural practices, soil fertility improvement and use of resistant bean cultivars

**CMR beetles (Mylabris sp)** - Appear in large numbers and eat flowers, reducing pod set

**Management** - Difficult to control because more vulnerable immature stages occur in the soil, sometimes outside bean fields. In small fields manual removal may be practical control strategy

**Bruchids** - damage beans in storage

**Management includes:** good storage hygiene, coating seed with edible oils (5ml/kg of seed), ashes or dust formulations and chemicals such as Phosphine tablets (aluminum phosphide)

### DISEASE MANAGEMENT

A wide range of diseases attack beans, that includes: bacterial (common blights), fungal (rust, anthracnose, leaf spots) and viruses (Bean common mosaic virus)

**-Bacterial blights** symptoms includes small water-soaked spots on underside of leaves which turn necrotic and become visible on upper surface; lesions may develop an area of chlorotic tissue around the spots; red-brown lesions maybe visible on pods; pod lesions may ooze or may turn tan in colour