



# Crop Management Practices

An Agricultural Extension Initiative of **INDORAMA**

## Sorghum





# Sorghum



## Introduction

Nigeria is the second largest producer of Sorghum, with the majority of domestic production used for household consumption/fodder. Sorghum is produced in virtually all the States in Nigeria, though some States produce more than others. Plateau, Kano, Kaduna, Sokoto, Gombe, Bauchi, Zamfara, Benue, Kogi, Nassarawa and Taraba are major Sorghum producing States.

Sorghum is grown on about 5.6 million ha in Nigeria and the current annual production is estimated to be only about 2.8 million tonnes. It has multifarious usages which span across the production of Malt, Beer, Beer powder, Sorghum meal, Sorghum rice, and Livestock feed among others. The whole grain may be grounded into flour which is then used in various traditional foods.

## Soil

Grain Sorghum can be grown on many different soils. Sorghum will yield best on deep, fertile, well-drained loamy soils. However, it is quite tolerant of shallow soil and droughty conditions. Fertile, well-drained soils are important to

optimize yield. Soils with clay-loam or loam texture, having good water retention capacity are best suited for sorghum cultivation.

## Climatic Requirements

Sorghum is a warm-weather Crop, which requires high temperatures for good germination and growth. The best time to plant is when there is sufficient water in the soil and the soil temperature is 15 °C or higher at a depth of 10 cm.

## Preparation of Land

Make one deep plough with Mould board plough in summer followed by 3 to 4 harrowings to maintain weed free conditions. Make compartmental bounds of 10m x 10m in the month of August for soil moisture conservation to help increase yields. Sorghum requires a well prepared seed bed for good crop establishment. Proper tillage reduces weeds by killing the germinating seedlings and burying deep the weed seeds. Seed bed preparation are governed by local conditions such as weed intensity, moisture availability and soil erosion risks.

## Method of Sowing

The crops are sown by bullock-drawn Seed drills with 2 or 3 coulters at 7cm depth in the soil. The seeds are covered by one harrowing after sowing by seed drill. It is also sown by tractor drawn seed drill with 4 coulters with simultaneous covering of seeds by blade attached to the seed drill.

**Seed rate spacing and plant population:** The optimum plant population recommended is 54,000 plants per acre (1.35 lakhperha) in rain fed conditions, where as it is 60,000 to 72,000 plants per acre (1.50to1.80 lakhperha) in irrigated conditions. It is achieved by using 8-10kg/ha and planting in rows of 45cm (1.5feet) wide with a plant to plant distance of 15cm.

**Seed Treatment:** For 1Kg of Rabi Sorghum Seeds mix 14ml Gouche or Confidor (Imidacloprid) with 2gms Bavistin (Carbondazim) and treat the Seeds.

## Fertilizer Management

Application of 10 tons/ha FYM at the last ploughing, Nitrogen is mostly lacking for optimum Sorghum production. Nitrogen recommendations will vary with expected yield, soil texture and cropping sequence. Approximately **80 kg of N (175 Kg Indorama Granular Urea)** and 40 kg  $P_2O_5$ /hectare is recommended. One half i.e 40 kg N and full  $P_2O_5$  is to be applied at sowing, while remaining 40 kg N is to be applied 30-40 days after sowing. In case of light soils with low rainfall, 60kg N and 30kg  $P_2O_5$  is recommended.

**Best Fertilizer Management Practices:** Soil pH should be 5.7 or higher, A starter Fertilizer is an option, but is a must if planting no-till. Apply P and K according to soil test recommendations., For heavy clay soils, increase N by 20 to 30%, Splitting N is advisable; apply 1/3 at planting

and the remainder when plants are in the 4- to 6-leaf stage. Head formation takes place after the 8-leaf stage and adequate N is needed at that stage to produce maximum yields.

## Pest Management

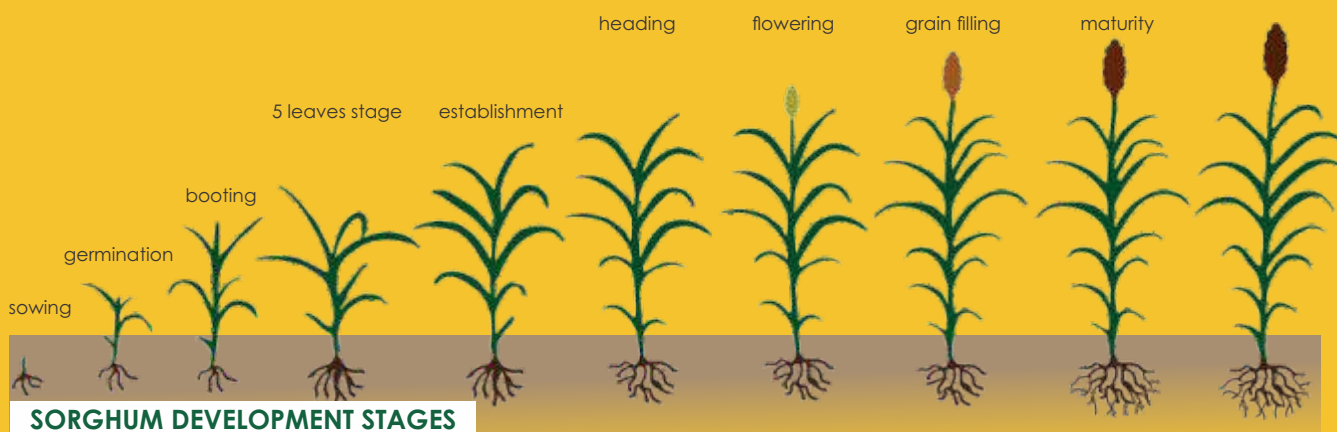
### Insect Pest Management:

**Shoot Fly** and stem borer are the major insect pests occurring in all season. Important practice is to increase seed rate and destroy the dead heart seedlings after removal. Furrow application of Carbofuran 3G @ 2 grams per row or spray Cypermethrin 10 EC @ 0.02% coinciding with Shoot fly oviposition (7-14 days after germination) only for late sown crop.

**Stem Borer (Chilo partellus)** destroy thrashed Sorghum earheads before the onset of monsoon; use high seed rate and thin out the infected plants after 10-12 days of sowing; apply Endosulfan 4G/Carbonfurn 2 gm @ 8- 10 kg per ha. in plant rows at the 20th and 35th days after germination

### Best Pest Management Practices

1. Deep ploughing to expose the larval and pupal stages of shoot fly;
2. Early sowing between last week of September to first week of October for escaping shoot fly incidence;
3. High seed rate @ 10 to 12 kg ha/ha is recommended in case delay in sowing;
4. Inter cropping of sorghum + safflower (2:1 ratio) in rabi season is recommended;
5. Seed treatment with Imidacloprid @14 ml/kg of seed or alternatively Furadan / Carbofuran 50 SP@100 g/kg of seed is recommended;
6. Soil application of Carbofuran 3G granules @ 20 kg ha-1 in furrows at the time of sowing as prophylactic measure to control shoot pest is recommended;
7. Releasing egg parasite, Trichogramma chilonis Ishii @ 12.5 lakh ha-1 is recommended to reduce shootfly incidence in rabi sorghum





## Disease Management

Grain mold in kharif and Charcoal rot in rabi are the two major diseases effecting Sorghum.

**Grain mold:** Molds occur when flowering coincides with rainfall. The grains turn black, white or pink in color. Grow resistant cultivars. Spray ear-heads with Aurefungin 200 PPM + 0.2 % Captan three times from flowering at 10 days interval or Dithane M 45 – 0.2 % + Bavistin 0.2 % twice at 10 days interval after commencement of flowering.

**Charcoal rot:** Charcoal rot is the significant rabi Sorghum disease, which is serious in the shallow soils in dry areas of Maharashtra and Karnataka. Grow resistant cultivars; apply minimum dose of Nitrogenous Fertilizers with low plant density in infected soils; adopt inter-cropping rather than sole cropping; resort to moisture conservation practices like mulching with wheat straw; and soil treatment with Thiram @ 4.5 kg/ha at the time of sowing.

## Weed Management

Summer ploughing for destroying stubbles and perennial weeds. Timely sowing of Crop to minimize Crop weed competition. Proper spacing to facilitate inter weeding operation.

Keep the field free from weeds. Inter cultivation, two-weeding with one shallow hoeing up to 3 weeks after sowing will keep the field free from weeds. To check severe weed infestation apply Atrazine @ 0.5 kg a.i. per ha followed by hand weeding within three weeks of sowing. Harvesting: Ideally Kharif sorghum should be harvested at its physiological maturity to avoid grain mold damage.

Best weed control practices depend on the predominant grassy and broadleaf weeds in your area and field. Base practices on your local extension and herbicide manufacturer guidelines, as indicated on the product label. Grain sorghum weed control programs are usually based around atrazine as the primary active ingredient.

## Yield

The productivity of Sorghum is dependent on quantity of rains during pre-sowing monsoon and water holding capacity of soil. Soil moisture conservation, use of high yielding cultivars and Fertilizer management plays a major role in improving the productivity of Sorghum. Crop grown in irrigated conditions with 2-5 irrigations with higher productivity potential may yield up to 3.0 to 3.5T/ha.

