Sweet Sorghum Production Technologies

Sorghum is the most important millet crop occupying largest area among the cereals next to rice. It is mainly grown for its grain and fodder. Alternative uses of sorghum include commercial utilization of grain in food industry and utilization of stalk for the production of value-added products like ethanol, syrup and jaggery and bioenriched bagasse as a fodder and as a base material for cogeneration.

Sweet sorghum has emerged as a supplementary crop to sugarcane in dry land pockets for the production of ethanol. The success rate is high because of the use of existing machinery available in the sugar factories and attached distilleries. The advantages of the crop are it can be grown with limited water and minimal inputs and it can be harvested in four months.

Varieties

Sweet sorghum stalk are juicy and rich in fermentable sugars as high as 15-18 per cent and has potential for cane yield of 40 t/ha or more. Projected uses of sweet sorghum are production of alcohol, syrup and jaggery from the stalk juice. The recovery of alcohol in the pilot run showed 9 percent of the juice having a brix of 12 0. So far SSV 84 is the only one variety has been released through All India Coordinated Sorghum Improvement Project by the National Research Centre for Sorghum at Hyderabad.

The important sweet sorghum varieties released at international level are Rio, Dale, Brandes, Theis, Roma, Vani, Ramada and Keller. BJ 248, RSSV 9, NSSV 208, NSSV 255 and RSSV 56 are the sweet sorghum cultures identified by the All India Coordinated sorghum improvement project at National level. Hybrid Madhura developed by Nimkar Agricultural Research Institute, Phaltan, Maharashtra is a popular hybrid in Sweet Sorghum. The TNAU has developed a Sweet Sorghum VMS 98003 with a cane yield of 45.7 t/ha and ethanol yield of 3.6 kl/ha as a promising sweet sorghum variety for Tamil Nadu and is being tested under Adaptive Research Trial and will be released soon. Most of these varieties mature in 100-110 days.

Climate and Soil

Sweet sorghum can be sown during June, coinciding with the south-west monsoon, September October during north east monsoon with a rainfall of 500-600 mm well distributed across the growing period and also during summer with assured irrigation. The crop does not prefer high rainfall as high soil moisture or continuous heavy rain after flowering may hamper sugar increase. If irrigation is available, sowing can be advanced before June so that the crop does not face heavy rains after flowering and more so during the last half of grain maturing period. Sowing during summer season may result in low biomass and sugar yield.

All soils that have medium depth (18" and above) with good drainage are suited. Depending on the soil (red, black, laterite and loamy) and its depth water requirement may vary which in turn decide the suitability of the crop.

Seeds and Sowing

For better productivity the optimum spacing should be 45 cm x 15 cm with a seed rate of 10 kg/ha. 2gm/kg of seed. Treat the seeds with 2% KH2PO4 for 6 hours as pre sowing treatment under rainfed condition. Before sowing, treat the seeds with azospirillum @ 600 gm/ha.

Sowing can be done on ridges and furrows at a spacing of 45 cm between rows and 15 cm within rows. Three to four seeds are dibbled in each hill/planting hole and the seedlings are to be eventually thinned to one per hill. If a planter is used, then the existing seed rate can be further reduced.

The sowing of the crop is to be adjusted so that the flowering should not be coincide with rains.

Irrigation and Nutrient management

Irrigation should be based on available soil moisture, which depends on the type of soil and the rainfall distribution. Minimum of 6 to 7 irrigations are required with an interval of 7 -10 days.

Recommended dose of fertilizer for soils with normal fertility level is 120 kg nitrogen, 40kg phosphorus and 40 kg potassium. Half of N and whole of P and K are applied as basal. Remaining N is to be top-dressed during 25-30 days after germination, following weeding and inter cultivation.

Weed management

Atrazine @ 0.2 kg ai/ha can be applied as pre emergence herbicide at 3 days after sowing followed by hand weeding at 45 days after sowing.

Pest management

Major pests are sorghum shootfly and stem borer. Shoot fly attacks soon after germination up to 30 days. Stem borer incidence may be at a later stage and continues up to maturity. Shootfly attack is noted by deadhearts in seedlings and heavy tillering in affected plants later. Shoot fly is controlled with the application of Carbofuran 2G @ 8-10 kg ha-1 during planting either along the furrow (in furrow sowing) or in a shallow furrows cut on the ridge (in ridge planting). The same insecticide could be applied in leaf whorls (2-3 granules/whorl) based on the foliar injury symptoms, to prevent stem borer tunneling.

Disease management

Downy mildew

Seed treatment with Metalaxyl at 4 g/kg of seed. Rogue out infected plants upto 45 days

after sowing and spray Metalaxyl 500g or Mancozeb 1kg or Ziram 1kg or Zineb 1 kg/ha. Spray Mancozeb 1250 g/ha after noticing the symptoms of foliar diseases, for both transplanted and direct sown crops.

Head Mould

Spray any one of the following fungicides in case of intermittent rainfall during earhead emergence and a week later. Mancozeb 1 kg/ha, Zineb 1 kg/ha, Captan 1 kg/ha + Aureofungin sol 100 g/ha.

Sugary disease

Sowing period to be adjusted so as to prevent heading during rainy season and severe winter. Spray any one of the following fungicide at emergence of earheads (5 10 % flowering stage) followed by a spray at 50% flowering and repeat the spray after a week if necessary. Ziram 1 kg/ha, Mancozeb 1 kg/ha, Zineb 1 kg/ha.

Rust

Spray Mancozeb at 1 kg/ha when the disease reached grade 3. Repeat fungicidal application after 10 days.

Harvest

The earhead should be harvested at physiological maturity and sun dried for removing excess moisture in the grain. The green cane should be cut at the ground level and sent to the mill for crushing at the earliest as the sugar content decrease in progression with time. In any case it should be crushed before 48 hrs failing which sugar content will be drastically reduced.

For Seeds Please contact

Varity SSV 84

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National Research Centre for Sorghum, Rajendra Nagar, Hyderabad - 500 030.

M/s. Bannari Amman Sugars Ltd., 252, Mettupalayam Road, Coimbatore - 43.

M/s. S.V. Sugar Mills Ltd., Palayaseevaram - 631 606, Kanchipuram Dt.

M/s. Sakthi Sugars Ltd., Jothi Nagar, Padamathur - 630 561, Sivagangai Dt.

M/s. Mohan Breveries & Distilleries Ltd., 158, Anna Salai, Chennai - 600 002.

Madura Hybrid

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