

Research note :

EFFECT OF PLANT DENSITIES AND FERTILIZER LEVELS ON GROWTH AND YIELD OF SWEET SORGHUM

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Sorghum [*Sorghum bicolor* (L.) Moench] is one of the most important food grain crop produced in India, being a staple food of a large section of the people. It is the third major cereal crop in India after rice and wheat.

It is extensively grown in central and southern state of country. The country has attended self sufficiency in sorghum grain. There may be possibility of reduction in the areas under grain sorghum resulting in a substantial reduction in fodder production; such areas will need to have a substitute crop which will maintain the fodder production.

Sorghum growers will have new avenues for earning more income and profit from the sorghum crop. New avenue indicates that sorghum can be used for jaggery and sugar production and be grown to coordinate its harvests with ideal periods of cane sugar factories. High energy sorghums are currently being developed for both grain and biomass production. These sorghums produce slightly lower grain yield than conventional grain sorghum but large amount of stover with high carbohydrate concentration.

Sweet sorghum stalks also can be used to generate steam for production of pulp, paper, plywood, methanol and ammonia. It is also used for forage and syrup.

The most striking point in sweet sorghum is that it responds to better fertilizer applications and wider spacing. It is well known phenomenon that an application of optimum fertilizer dose to sweet sorghum increases the production, quality of grain and fodder yield. In view of this, the experiment was conducted

to study the effect of plant densities and fertilizer levels on grain and green cane yield of sweet sorghum.

A field experiment was conducted at Sorghum Research Project, Mahtma Phule Krishi Vidyapeeth, Rahuri, Dist.Ahmednagar (Maharashtra), during Kharif season of 1998 on clay soil containing low available nitrogen (190.5 kg ha⁻¹), medium available phosphorus (15.4 kg ha⁻¹) and high in available potassium (658.6 kg ha⁻¹). The sweet sorghum variety SSV-84 was used for the study which is relatively photo insensitive, tall and has juicy stalks with higher sugar content. Four plant densities viz, 1.48 (P₁), 1.11 (P₂), 0.74 (P₃) and 0.83 (P₄) lakh plants ha⁻¹ and four levels of fertilizer viz., 50 % (F₁), 75 % (F₂), 100 (F₃) and 125 % (F₄) of recommended dose (120:60:60 NPK kg ha⁻¹) were tried in split plot design with three replications. The Gross and Net plot sizes were 4.50 m X 3.60 m and 3.60 m X 2.70 m, respectively.

Dry matter accumulation :

The total dry matter accumulation plant⁻¹ was higher with lower plant density (0.83 lakh plant ha⁻¹) (Table 1). It was decreased by 8.70 per cent due to higher plant density of 1.48 lakh plants ha⁻¹ than that of lower plant density of 0.83 lakh plants ha⁻¹ at harvest. This may be due to mutual competition between the plants for light, moisture, nutrients and space under high plant density resulting in lower dry matter production. Similar results were reported by Rangantha (1977) and Huda (1988).

The dry matter per plant significantly increased with the increasing fertilizer level (Table 1). The differences were

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