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Production of Seed Corms through Cormels in Elephant Foot Yam [*Amorphophallus paeoniifolius* (Dennst.) Nicolson]

Elephant foot yam (*Amorphophallus paeoniifolius* (D.) Nicolson) is an important aroid grown for its nutritious corms, cormels and pseudo-stem. The cultivation of elephant foot yam is limited to India, Philippines, Indonesia, China, Sri Lanka and South East Asia. The edible corm is consumed regularly in Kerala and West Bengal in India and Japan but only as an occasional food in most other regions (Stephan et al., 1986).This crop is propagated through corms, cormels and cut pieces of corms or setts. At the time of planting, the whole corm is cut into setts of 500-750 g each bearing a portion of the central bud. While preparing setts there is wastage of about 30-40% portion of the edible corm. In general, larger size corms always yield higher than smaller size in elephant foot yam (Ashokan et al., 1984; Sen et al., 1995; Sethi et al., 2002). However, corm bulking efficiency was higher with smaller corms (Alam and Narzary, 1997; Ashokan et al.,1984).

The whole corm (500-750 g seed corm) is preferred as planting material over cut corms, because of early sprouting, vigorous growth, higher yield and saving of labour. Whole seed corm produces earlier sprouts than cut corms (Sen et al., 1996). Field experiments conducted in West Bengal revealed that the use of whole seed corm produced higher shoot length, basal girth, canopy spread, mean corm weight, mean corm girth and corm yield per plant than cut corms (Dutta et al., 2003; Sen et al., 1996). Better crop growth and productivity with whole corms was reported earlier (Dwibedi and Sen, 2000; Feng et al., 1997). But the availability of 500-750 g seed corms is a major constraint in elephant foot yam production. Hence, efforts to produce seed corms from cormels were made.

The field experiment was conducted during 2005 and 2006 at ICAR Research Complex for NEH Region, Tripura Centre, Lembucherra, which is located at 22° 56' to 24° 32'N latitude and 91° 10' to 92° 21' E longitude. The soil of the experimental site is clay loam in texture having medium fertility status with mild acidic pH. The var.TRC-Badama has profuse cormel (6-8 per corm) bearing character and it matures earlier (265 days) than var. Gajendra (285 days). The experiment was laid out in Randomized Block Design with four replications. Treatments comprised of five categories of cormels of TRC-Badama, (10-20 g (T_1), 20-30 g (T_2), 30-40 g (T_3), 40-50 g (T_4) and 50-60 g (T_5). These were planted on one side of the ridges at a spacing of 30 x 30 cm. Mulching after planting by using paddy straw was done. NPK @ 60:40:60 kg ha^{-1} were applied in two split doses. Observations on early sprouting, plant height, pseudo-stem girth (cm), leaf area (cm^2) and corm weight (g) were recorded.

The data pertaining to vegetative growth and corm production is given in Table1. The highest plant height (94.56 cm), pseudo-stem girth (11.65 cm), leaf area (4621.98 cm^2) and corm weight (821.96 g) were observed in the plants grown from cormels weighing 50-60 g, where as the lowest plant height (68.66 cm), pseudo-stem girth (5.91 cm), leaf area (2156.20 cm^2) and corm weight (375.63 g) were observed in the plants grown from cormels weighing 10-20 g. It was found that the cormels weighing above 40 g sprouted 15-20 days earlier than the other cormels and 500-600 g seed corms could be easily produced from cormels weighing more than 20 g. The early sprouting might be due to the availability of stored materials in the cormels and biochemical reactions leading to quick dormancy breaking. The weight of cormels was directly proportional to the weight of corm produced. This result is similar to that of Alam and Narzary (1997) and Ashokan et al. (1984).

Corm bulking efficiency, average corm diameter and corm weight decreased with increase in plant density, whereas corm bulking efficiency decreased and corm diameter and weight increased with increase in corm sett size (Das et al., 1995a). A corm sett size of 150 g planted at 1,40,000 plants ha^{-1} was found optimum for production of 500 g size whole seed corm (Das et al., 1995a). Maximum corm yield (85.8 t ha^{-1}) was obtained when the largest setts (250 g) were planted at the highest density (1,40,000 plants ha^{-1}) (Das et al., 1997) with

Table 1. Effect of cormel size on vegetative growth and corm parameters in elephant foot yam

Treatments (cormel size (g))		Plant height (cm)	Pseudo-stem girth (cm)	Leaf area (L x B) (cm^2)	Corm height (cm)	Corm girth (cm)	Corm weight (g)
T_1	10-20	68.66	5.91	2156.20	8.16	28.26	375.63
T_2	20-30	73.16	6.95	2790.25	9.83	34.53	452.23
T_3	30-40	79.03	8.58	3213.40	11.90	39.40	535.50
T_4	40-50	89.20	9.26	4022.51	12.33	42.26	647.26
T_5	50-60	94.56	11.65	4621.98	12.63	45.56	821.96
CD (0.05)		8.02	0.69	206.21	1.16	6.98	60.27

the planting geometry of 30 x 25 cm in alluvial soils (Das et al., 1995b). James George and Nair (1993) also reported that closer planting of elephant foot yam produced higher corm yield under Kerala conditions.

The highest seed corm yield (56.1 t ha^{-1}) was obtained when the biggest apical corm setts (300 g) were planted at a closer spacing (45 x 30 cm) (Mondal and Sen, 2004). Thus in the present study also corm size of 450-500 g could be obtained from cormels weighing 30-40 g planted at 30 x 30 cm spacing.

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