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ESTABLISHMENT OF SEED PRODUCTION AREA OF *ACACIA NILOTICA* (L.) WILD. EX DEL. SSP. *INDICA* (BENTH.) BRENAN IN GUJARAT

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ABSTRACT

Developing seed production areas (SPAs) is one of the first steps in tree improvement programme that can be used to obtain genetically improved seed for immediate planting. It is usually for the short term in nature. Though seeds obtained from this method do not yield large volume of genetic gain, it sometimes greatly improves tree quality.

After survey of *Acacia nilotica* ssp. *indica* plantations at six sites in Godhara, Nadiyad and Junagarh planted by SFD, Gujarat during 1970-84, 25ha. at Gushar (Godhara) and 15 ha. at Pawagarh (Godhara) were converted into SPAs after inter-comparing various other seed stands. After scoring each tree in the stand and ranking them in descending order, out of 44,635 trees at Gushar, 30691 plants were culled and 13944 trees were retained while out of 5712 trees at Pawagarh, 1510 were culled and 4212 were retained. After culling, the average height, clear bole, and girth diameter were found to be shifted towards the higher side in both the stands. Seeds collected after establishment of SPA showed improvement in seed weight and germination percentile.

Key words: *Acacia nilotica* ssp. *indica*, Culling, Seed production area, Gujarat

Introduction

All tree improvement programmes must have seed production at some stage of their development if continued gains are to be achieved. This is true even for programmes using vegetative propagules for large-scale operational planting. Seed is needed for the development of outstanding trees from which vegetative propagules can be obtained (Roche, 1979). Most tree species reproduce naturally by seeds and growing of seedlings is most commonly adopted in afforestation and reforestation programmes than any other method of propagation. Generally trees are heterozygous and cross-pollinated and have considerable potentiality for genetic variability. Consequently, seedling production may result in variability among plants and the inability to transmit specific characteristics from seed-source tree to offspring. These characteristics present the importance of careful seed selection practices and use of high quality seeds in the success of plantation programmes (Zobel, 1978; Zobel and Talbert, 2003).

Tree improvement covers both the selection and population (species, provenance, seed stands) and the selection and breeding of individuals. It includes the identification of superior phenotypes; testing of their offsprings in progeny trials and bringing together tested superior genotypes for seed production to which both male and female parents contribute their superior genes (Lee, 2007; Harwood *et al.*, 2007).

A stand of natural plant or group of stands, periodically rogued, and managed to enhance seed production is known as seed production area. Though the genetic quality of the seed is uncertain but it provides the seed of known origin from the best phenotypes available. The establishment of seed production areas is a stop-gap measure, designed to provide seed of the best possible quality until seed orchards begin to bear seed. The degree of improvement to be expected from seeds from such areas is less than progeny tested stands but it is of considerable benefit just to have seed of known origin and to have seed collection concentrated on specific areas. Seed yield from such areas will vary per tree and also from year to year on the same tree or area. Such factors as spacing, diameter, crown length, period of time since release, inherent fruitfulness, insects, and disease and climatic conditions all have significant effects (Hosius *et al.*, 2006).

About the species

Acacia nilotica (linn) Wild *ex.* Del is generally accepted as a single natural species. This species is variable

Seeds collected after establishment of SPA (Seed Production Area) showed improvement in seed weight and germination percentile.

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