

**SEED TRAIT VARIATION IN ACACIA CATECHU WILLD.****Mohit Gera, Neelu Gera  
and Farooq Ahmad Dar****Abstract**

Twenty genotypes of *Acacia catechu* Willd. scattered over the entire natural range of Jammu region were studied for variation in pod, seed, germination and nursery characteristics. Highly significant variations were observed among the genotypes for all the characters studied. The extent of variation observed for germination characters was large compared to other characters studied. Significant positive correlations were observed for seed weight and germination, pod size (length & width) and germination, number of seeds per pod and germination. The seed from families F7, F10, F13, F14 and F5 were found to be more vigorous on the basis of nursery performance and are recommended for establishment of seed orchards and for future improvement programs. Pod length, pod width, number of seeds per pod, seed weight and germination were observed to be important characters in evaluating the genotypes.

**Introduction**

The knowledge of genetic variation within a species is a pre-requisite for developing effective tree improvement programs. Forest tree improvement programs begin with the scanning of available variation in the entire range of the species distribution and then selection of suitable genotypes. Without sufficient information on variability in important traits, an attempt to use genetics to improve forest trees may not be successful. Variation in several seed and germination traits and its significance in seed sources' studies have been documented in a number of tree species viz., *Albizia lebbek* (Kumar and Toky, 1993), *Prosopis juliflora* (Sharma *et al.* 1994), *Pinus sylvestris* (Reich *et al.* 1994), *Acacia nilotica* (Bagchi and Dobriyal, 1990; Ginwal *et al.*, 1995; Mathur *et al.*, 1984). Reports on effect of seed size on germination, early development and physiology of tree species are inconsistent. In some studies a positive correlation was observed between seed size and seedling size (Dunlap and Barnett, 1983) while in others it was unrelated (Szezygiel, 1981; Dormling and Jonhsen, 1992). Seed weight has been reported to be one of the most useful parameter for early selection of superior provenances (Khalil, 1986) while seed size and colour are important markers for identifying populations (Harper *et al.*, 1970).

\*

State Forest Research Institute, Janipur, Jammu – 180 007 (J&K), India

On account of its natural hardiness, fast rate of growth and value of wood, *Acacia catechu* Willd. is an ideal species and has been widely used in afforestation programs throughout the Indian sub-continent. The species is valued for nitrogen rich fodder, high quality fuelwood and charcoal, low cost structural timber and for variety of medicinal uses. The most important commercial use of this tree is Katha and Cutch, obtained when heartwood is boiled in water. The species is native to India, where it is widely distributed throughout the greater part of the Country barring the most humid and the driest regions. Three varieties of the species have been distinctly identified, viz., var. *catechu*, var. *catechuoides* and var. *sundra*. Out of these, var. *catechu* is found in the State of J&K in dry deciduous forests of Jammu region. Khair is a classical example of Pioneer species in the riverine succession. It is amongst the principal tree species commonly recommended for plantation programs in the dry and frosty regions for soil and water conservation as well as for production of wood for manufacturing of "Katha" and "Cutch".

In this paper, variation in pod, seed, germination and nursery performance of twenty different genotypes of *Acacia catechu* from almost the entire natural range of Jammu region is reported. The candidate plus trees (CPT's) selected on the basis of this progeny test will be utilized for further improvement in the species and for establishment of seed orchards.

### Materials and Methods

The study was conducted at Seed Development Division, Jammu situated at 32°17' N latitude and 73°26' E longitude. The area is situated at an altitude of 400m above msl and enjoys semi arid type of climate with mean annual rainfall 1050 mm. The seed collection area falls between 32° 25' to 32° 68' N latitude and 74° 89' to 75° 90' E longitude which covers almost the entire range of its geographical limit in Jammu region.

Pods of twenty candidate plus trees (Table 1) were collected from almost the entire natural range of the species in Jammu region during February, 2000. Approximately 500 grams fully ripened pods from each tree were collected and labeled separately. The pods were sun-dried and seeds were extracted manually. Four replicates were drawn manually from each seedlot. Fifty undamaged pods were randomly drawn from each replicate and measured for their maximum length, width and number of seeds per pod. A total of 400 randomly drawn seeds from each seedlot in four replications, each of 100 seeds were measured for their maximum length and width. Seed weight of eight randomly drawn samples each of 100 seeds, for each seedlot were obtained and 1000 seed weight was calculated.