

The clones studied exhibited moderate variability for different characters. Number of stalks per clump ranged from 30 to 120 with a mean of 75 stalks per clump. Stalk length ranged from 140 cm to 270 cm with a mean of 208 cm. Stalk diameter ranged from 6.02 mm to 15.37 mm with a range of 10.8 mm. The internode length ranged from 8.1 cm to 20.2 cm with a mean of 13.84 cm. The pollen fertility ranged from 62.7 to 99.9%. The mean pollen fertility was 94.38%. Hand refractometer brix ranged from 2.0 to 13.4% with a mean of 6.28%. Out of the thirty-nine clones evaluated thirteen clones did not flower. Of the twenty-six clones that flowered, all except one (MPTh 97-113 with 62.7% pollen fertility) had a high pollen fertility of above 80%. Six clones recorded HR Brix of 10% and above at 12th month and the highest recorded was 13.4% in MPTh 99-458. The lowest Brix of 2.5% was recorded in MPTh 97-208.

The variability observed for the six characters was low to moderate. Variability for stalk diameter and stalk

height was low while that for internode length and H.R.Brix was moderate. MPTh 97-228 with stalk height of 275 cm and internode length of 13.77 cm is one of the superior clones, with moderate flowering intensity and 90.2 percent of pollen fertility. This clone could be useful in the breeding programmes. Another clone, MPTh 97-208 with stalk height of 250 cm and Internode length of 13.3 cm is also superior, but it did not flower. All these materials are being maintained at Sugarcane Breeding Institute, Research Centre, Agali.

References

- Kandasami PA, TV Sreenivasan, TC Ramana Rao, K Palanichamy, BV Natarajan, KC Alexander, M Madhusudana Rao and D Mohanraj (1983) Catalogue on Sugarcane Genetic Resources 1. *Saccharum spontaneum* L. Sugarcane Breeding Institute, Coimbatore 641 007
- Sreenivasan TV, VA Amalraj and A William Jebadhas (2001) Sugarcane Genetic resources V *Saccharum spontaneum* Vol.II 125 p. Sugarcane Breeding Institute, Coimbatore 641 007
- Naidu KM, and TV Sreenivasan (1987) Conservation of sugarcane germplasm in: Copersucar international sugarcane Breeding Workshop. Copersucar p 33-54.

Introduced Germplasm and Varieties of Sugarcane

VA Amalraj, AW Jebadhas, NV Nair and N Balasundaram

Division of Crop Improvement, Sugarcane Breeding Institute (ICAR), Coimbatore

Key Words: Introduction, Germplasm, Saccharum, Sugarcane

Sugarcane (*Saccharum hybrids*) is a major cash crop of the tropical and sub-tropical regions of India. In the world, India ranks second in area and production of sugarcane. Sugarcane Breeding Institute, Coimbatore is the pioneering research center for developing improved sugarcane varieties. It is designated as one of the two repositories of world collection of sugarcane genetic resources. It is also identified as the National Active Germplasm Site by NBPGR. Sugarcane improvement programme throughout the world is closely linked with the exploration, collection, introduction and utilisation of both cultivated and wild genetic resources. The interspecific hybridisation involving cultivated and wild species forms the basis of varietal improvement programmes.

The two major centers of diversity for the cultivated species *S. officinarum* and the wild species *S. robustum*

are New Guinea and the adjoining island chains of Indonesian Archipelago. *S. officinarum* also known as 'noble cane', have soft, thick, juicy stems with high sucrose content. One introduced variety 'Poovan' has been under cultivation since long as chewing cane used during Pongal harvest festival. This species is generally used as female parent in all the basic hybridisation programmes and around 35 clones figure in the pedigree of commercial varieties. Number of clones of sugarcane germplasm introduced from different countries are given in Table 1.

Under an Exploration and Collection programme titled '*Spontaneum Expedition Scheme*' sponsored by the Indian Sugarcane Committee, over 500 clones of wild sugarcane germplasm mainly representing *S. spontaneum*, and *Erianthus* were collected by SBI from India and adjoining countries (listed in Table 1) from

Table 1. Basic Germplasm introduced from other countries (No. of clones given in brackets)

Species	Country
<i>Saccharum officinarum</i>	Indonesia, Papua New Guinea, Fiji, New Caledonia, etc. (773)
<i>Saccharum robustum</i>	Papua New Guinea (77), Indonesia (49)
<i>Saccharum edule</i>	Papua New Guinea (9), Indonesia (7)
<i>Saccharum spontaneum</i>	Bangladesh, Burma, China, Congo, Algeria, Egypt, Fiji, Guam, Indonesia, Kenya, Nepal, Uganda, SriLanka, Phillipines, Singapore, Vietnam, Israel, Mauritius, New Guinea, Thailand, Japan, Malaysia, Russia, Taiwan. (138)
<i>Saccharum sinense</i>	China (7), Japan (1)
<i>Erianthus spp</i>	Indonesia (86), Thailand (6), Burma (4), Nepal (4) Fiji (4), Papua New Guinea (5), Vietnam (2)

1947 to 1956. Only one clone collected from Java appear in the pedigree of most varieties.

During 1966-1973, under US PL480 project, attempt to introduce disease resistance and hardiness from Indian "Spontaneums" into foreign commercial varieties was made. Commercial varieties from Hawaii and Puerto Rico were crossed with selected *S. spontaneum* clones and 150 hybrids were selected from the derived population. These were designated as (IA) Indo-American clones. Some of these clones are found in the pedigree of commercial varieties Co 7908 and Co 8318. 130 Indo-American clones and 585 Foreign hybrids are being maintained at Kannur centre of SBI.

Many foreign clones, especially POJ varieties, have been utilized in sugarcane improvement programmes. A list of foreign clones that have entered into the pedigree

Table 2. Foreign germplasm introgressed into Indian varieties

No	Country (source)	List of varieties/clones
1	Indonesia	EK 28, POJ 100, POJ 181, POJ 213, POJ 385, POJ 1410, POJ 1499, POJ 2364, POJ 2725, POJ 2878, POJ 3247, Kassoer, <i>S. spontaneum</i> (Java).
2	USA	CP 670, CP 1165, CP 34120, CP 29-116, CP 34-120
3	Mauritius	M 2, M 4000
4	Australia	Q 63, Q 116
5	West Indies	B 3412, B 3747

Table 3. Recently introduced Sugarcane germplasm

	Year	Country	EC nos.	No of clones
1	1999	Thailand	432420-432570	150
2	2000	China	453250-453252	3
3	2000	USA	453405-453417	13
4	2003	Mauritius	516236-516240	5

of Indian commercial varieties is given in Table 2. POJ 2878 is the only introduced variety from Indonesia that has ever been successful in this country as a cultivated commercial variety.

Recently, sugarcane germplasm, both wild and cultivated, have been imported from the following countries (Table 3).

Efforts are being made to introduce *Erianthus kanashiroi* from Japan, China; *E. hostii* from Iran, Iraq; *E. rufipilus* & *E. sikkimensis* from Bhutan and *E. longisetosus*, *E. hookerii*, *E. filifolius*, *E. giganteus*, *E. brevibarbis*, *E. strictus*, *E. alopecuroidus*, *E. coarctatus*, *E. contortus*, *E. maximus* from USA.

Utilization of Gene Pool in Genetic Improvement in Forage Oats – Achievements and Future Prospects

AK Roy and RN Choubey

Indian Grassland and Fodder Research Institute, Jhansi-284003, Uttar Pradesh

Plant genetic resources are vital inputs for sustaining genetic improvement programme. For an efficient breeding programme, a large collection of cultivars, landraces and wild relatives of the species need to be assembled has to be made, both from exotic and indigenous sources.

Oat (*Avena sativa* L.) is an important cultivated cereal for both fodder and feed purpose. It ranks sixth in world cereal production following wheat, maize, rice,

barley and sorghum. It is an important winter forage crop. It has wide adaptability in northern and north western regions of the country because of its excellent growth habit, quick regrowth and highly nutritive value for both milch as well as draft animals.

The species which make up the genus *Avena* are from a polyploid series with a basic chromosome number of $n = 7$. Three naturally occurring ploidy levels are