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SWORDBEAN SBS 1 - A HIGH YIELDING BUSHY VARIETY

U. SELVARAJ, K. GANESAMURTHY, R. RATHNASWAMY and S.R. SREE RANGASWAMY
School of Genetics, Tamil Nadu Agricultural University Coimbatore - 641 003

ABSTRACT

Sword bean selection SBS 1 is a new vegetable cum pulse crop introduced for cultivation. It is a pure line selection and capable of giving good yield in all types of soil and climatic condition. It is a short duration bushy type with photoinsensitivity. The tender pod yield obtained from this culture was 7500 Kg/ha and as a grain crop 1310 Kg could be obtained from a hectare under irrigation.

The nontraditional pulses claim an important place in pulses production owing to their high yield potential basides possessing wide adaptation for varied types of soils and climate. They are rich in protein and most of them are known for their vegetable value. Swordbean (*Canavalia gladiata* (Jacquin) DC.) is one among them which has been under cultivation for a long period in Tamil Nadu. The local varieties of swordbean are long in duration, low yielding, trailing type and photosensitive. An effort was made to identify a short duration, photoinsensitive high yielding swordbean variety.

Table 1. Performance of Swordbean SBS 1 in Tamil Nadu Agricultural University, Coimbatore.

Year	Season	Yield kg/ha	
		Grain	Tender pod
1980	Kharif	1050	-
1981	Kharif	1100	-
1982	Kharif	1200	-
1983	Kharif	1150	-
1984	Kharif	1200	-
1984	Rabi	1050	-
1985	Summer	1100	-
1985	Kharif	1050	-
1985	Rabi	1100	-
1986	Summer	1000	-
1986	Kharif	1200	-
1986	Rabi	1100	-
1987	Summer	1100	-
1987	Kharif	1200	7000
1987	Rabi	1250	6500
1988	Summer	1050	-
1988	Kharif	1200	8000
1988	Rabi	1260	7500
1989	Kharif	1300	8500
	Overall mean	1137	7500

MATERIALS AND METHODS

With an objective to evolve a short duration photoinsensitive swordbean variety, seeds of a local accession were obtained from University of Agricultural Sciences, Bangalore during 1978. The local accession was subjected to selection and progeny testing. Further selection and evaluation resulted in the identification of a pure line SBS 1 in 1980. It was evaluated simulteneously for its pod as well as grain yield potential in kharif, rabi and summer seasons during the period between 1980-89 at Millet Breeding Station, Tamil Nadu Agricultural Univesity, Coimbatore. Based on its superior performance in station trials it was forwarded to 38 onfarm trials 1987 to 1989 in Tiruchirapalli, Periyar and Coimbatore Districts.

RESULTS AND DISCUSSION

SBS 1, a pureline selection was found early maturing (110-120 days), photoinsensitive and bushy plant type. The results of nineteen trials over kharif, rabi and summer indicated that this culture give 1137 Kg of grain per ha 7500 Kg of tender green pods could be harvested from one ha (Table - 1). The results of thirty eight on farm trials conducted in three districts revealed that the culture SBS 1 gave a mean grain yield of 1575 Kg per ha

Table 2. Performance of swordbean SBS 1 in onfarm trials.

Taluks	No.of trials	Grain yield kg/ha
Udumalpet	7	1355
Coimbatore	17	1627
Palladam	1	2000
Pollachi	6	1488
Gopi	5	1613
Kodumudi	1	1750
Trichy	1	1938
Overall Mean of 38 trials		1575

under irrigated condition (Table - 2). Besides high pod and grain yield, the protein content of seed was 25.9 per cent. It also shows an extreme tolerance to the drought and highly suited for all cropping system.

The morphological description of SBS 1 are; Habit - bushy and erect, plant height - 73 cm, pigmentation (stem) - green, mean No.of branches - 4-5, leaves-trifoliate, inflorescence-axillary receme, flower colour-light purple, pods long, flat and green, pod length-28.5 cm, pod breadth-2.6 cm, seeds per pod-12.6, 100-seed weight-131.6 g, days to 50% flowering-45-50 days, days to maturity-110-120 days.

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EFFECT OF SOIL STRUCTURAL INDICES AND DISPERSION COEFFICIENT ON SATURATED HYDRAULIC CONDUCTIVITY

P.P. MAHENDRAN and K.K. MATHAN

Department of Soil Science and Agricultural Chemistry, Agricultural College and Research Institute, Madurai

ABSTRACT

Soils from two major subgroups *viz.*, Typic Chromusterts and Typic haplustalf were evaluated for establishing the relationship between soil structural indices such as Percentage Aggregate Stability (AS), Structural Coefficient (SC), Mean Weight Diameter (MWD) and Dispersion Coefficient of Silt + Clay (DCSC) and clay alone (DCC) with saturated hydraulic conductivity. AS and SC were observed to influence Ks directly, MWD which is a measure of the stable pore geometry also directly influenced Ks. DCSC and DCC were significantly negatively correlated with Ks, perhaps influenced by ESP and SAR.

Hydraulic conductivity has a positive and highly significant correlation with soil aggregates greater than 0.25 mm and with mean weight diameter (Khanna *et al.*, 1975). Sandhu and Bhumbla (1968) recorded better correlation of aggregates with dispersion coefficient of clay than with clay and silt, suggesting the dominant role in the formation of stable aggregation. These soil structural indices are observed to vary in their effectiveness of influence on the saturated hydraulic conductivity. In the present study it was taken up to evaluate the effective involvement of some soil structural indices in shaping the hydraulic conductivity of soils under various conditions.

MATERIALS AND METHODS

Representative soil samples numbering 15 from horizons of four soil profiles belonging to soil subgroup, Typic Chromustert (Tcsc) and 12 from horizons of three soils profiles belonging to soil subgroup, Typic Haplustalf (Thsf) were collected in Kamarajar district of Tamil Nadu. Standard analytical methods described by Dakshinamoorthy and Gupta (1968) were employed to estimate the dispersion coefficient of silt and clay and clay alone, per cent aggregate stability (Structural Coefficient), Mean Weight Diameter. Soil reaction was determined using glass electrode and Electrical Conductivity was determined in the 1:2 soil water suspension using conductivity bridge (Piper, 1966). Organic carbon was estimated by the wet digestion method of Walkley and Black (1934). Saturated hydraulic conductivity (Ks) was estimated in the core samples (7.5 cm dia x 7.5 cm height) following the method described by Dakshinamoorthy and Gupta (1968).

RESULTS AND DISCUSSION

The structural indices along with the relevent soil physical properties of the subgroups are given in Table 1. The percentage of aggregate stability (AS) ranged from 40.01 to 90.68 and 29.9 to 70.7 with an average ranging from 51.0 to 73.2 and 45.0 to 58.9 in the pedons of the subgroups, Typic Chromustert (Tcsc) and Typic Haplustalf (Thsf) respectively. As the percentage of aggregates greater than 0.25 mm increased, the saturated hydraulic conductivity (Ks) was observed to increase in the soil, because the stability of aggregates helped in the formation of stable pore geometry which in turn aided the conduction of water. There was a significant positive correlation