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PERFORMANCE OF INTERSPECIFIC HYBRIDS OF *Sorghum bicolor* X *S.Halepense* FOR FODDER QUALITY CHARACTERS

P.JAYAMANI AND M.STEPHEN DORAIRAJ
School of Genetics, Tamil Nadu Agricultural University, Coimbatore 641 003

ABSTRACT

Per se performance for seven quality characters in 30 interspecific hybrids of sorghum involving 11 parents (six *Sorghum bicolor* varieties and five *S.halepense* accession) was studies. The parents SS 44, SS 31, SS 30 with high brix value and Co27 and SS 33 with low crude fibre content were identified as donors for the improvement of fodder types with high quality. All the parents and hybrids recorded HCN content below 200 ppm.

KEYWORDS : Sorghum, Interspecific hybrids, Fodder quality

Among cereals, sorghum assumes specific importance in India as major grain cum fodder crop and it is extensively grown for fodder particularly in the Northern States. Quality traits form important selection criteria in fodder sorghum which include high protein content and brix value, low crude fibre and HCN content. The present investigation was undertaken to study the performance of interspecific hybrids for quality characters for identifying genotypes to be used as donors in the hybridization programme.

MATERIALS AND METHODS

Five sweet sorghum varieties, SS 25, SS 30, SS 31, SS 33 and SS 44 besides CO 27 as lines and five accessions of *S.halepense* (2n=40), FD 1690, FD 1691, FD 1692, FD 1693 and FD 1694 as testers were crossed following a line X tester mating design. The eleven parents and 30 F1 hybrids were evaluated during *rabi* 1990 in a randomized block design with two replications. A spacing of 45 cm between rows and 30 cm between plants was adopted. For estimation of quality parameters at 50 per cent flowering, a composite sample was prepared for each treatment in each replication by compositing chopped and dried material of each plant prior to grinding. Standard Brix Hydrometer was used to determine the brix value. Dry matter, fat and ash contents were determined with standard methods (AOAC, 1970). The crude protein content and crude fibre were estimated following methods Humphries (1956) and Goering Vansoest (1970) respectively . HCN content was determined following Hogg and Ahlgren (1942). The data were subjected to analysis of variance following Panse and Sukhatme (1967).

RESULTS AND DISCUSSION

The mean performance of parents and hybrids for seven quality characters is presented in the Table.1. There were significant difference between parents and hybrids for all the characters. Generally all the sweet sorghum parents had higher juice content and brix value than *S.halepense* accessions besides one of the ovule parents CO 27. The first five hybrids that registered high brix value had SS 31 or SS 44 as one of the parents in two cases each and SS 30 as one of the parents in one hybrid indicating more sweetness, which is a desirable fodder character to determine acceptability and palatability by the cattle. The ovule parents had low dry mater content than the pollen parents. This might be due to higher juice content in the fresh stems of the ovule parents than in the pollen parents. Among the hybrids, SS 33 X FD 1691 ranked first followed by SS 33 X FD 1690 and CO 27 X FD 1690.

The hybrids recorded relatively higher mean value for crude protein content than the parents. The requirement of crude protein upto a maximum level of seven per cent becomes essential for proper digestion as well as intake of the fodder (Minson, 1975).The hybrids possessed 8.98 to 11.27 per cent crude protein indicating their suitability as a nutritious fodder. The pollen parents had lesser amount of ash than the ovule parents. This might be due to high amount of crude fibre in the pollen parents. All the hybrids registered relatively higher ash content than the pollen parents, indicating that they possessed considerable quantity of minerals, a desirable attribute for a fodder crop. As for the fat content, FD 1693 ranked first followed by FD 1694 among the parents and SS 44 X FD 1694 ranked

Table 1. Mean performance of parents and hybrids of fodder crop: quality characters

Parents and Hybrids	Brix value (%)	Dry matter content (%)	Crude Protein content (%)	Ash content (%)	Fat content (%)	Crude fibre content (%)	HCN content (ppm)
Lines							
SS 25	12.70	19.45	9.01	10.16	1.88	33.23	33.16
SS 30	13.10	18.56	8.91	10.16	2.44	32.31	16.49
SS 31	13.80	21.32	8.31	9.00	2.26	32.00	183.16
SS 33	10.40	21.91	9.22	9.37	2.43	31.02	183.33
SS 44	14.20	17.17	9.33	9.50	2.53	32.49	33.49
CO 27	7.80	24.04	9.05	9.62	2.57	30.82	83.33
Testers							
FD 1690	6.40	27.39	6.45	8.05	2.55	35.62	46.16
FD 1691	6.90	27.00	5.69	7.85	2.34	35.44	16.49
FD 1692	6.50	23.60	6.83	6.94	2.73	34.94	83.49
FD 1693	5.80	24.10	7.39	8.35	3.09	34.92	33.16
FD 1694	5.70	23.93	7.06	9.00	2.81	34.47	16.66
SS 25 x FD 1690	9.39	22.36	9.03	8.98	1.97	33.01	83.16
SS 25 x FD 1691	8.70	20.37	9.92	9.60	2.40	33.25	33.33
SS 25 x FD 1692	8.70	20.04	9.94	8.36	2.32	32.03	33.34
SS 25 x FD 1693	7.60	24.40	9.26	9.41	2.99	30.57	100.16
SS 25 x FD 1694	8.00	25.00	11.19	9.00	2.91	32.30	83.16
SS 30 x FD 1690	10.10	24.41	9.05	9.47	2.21	31.00	33.49
SS 30 x FD 1691	11.00	24.09	9.17	9.51	2.60	31.24	50.16
SS 30 x FD 1692	9.29	19.99	10.28	8.34	2.45	31.43	16.83
SS 30 x FD 1693	8.20	23.99	8.99	9.30	2.89	30.01	33.49
SS 30 x FD 1694	8.60	20.97	10.05	8.42	3.00	30.41	16.49
SS 31 x FD 1690	10.40	23.31	9.39	9.05	2.22	30.04	150.16
SS 31 x FD 1691	11.10	22.31	9.16	9.38	2.48	31.91	183.16
SS 31 x FD 1692	12.30	21.94	11.27	8.61	2.92	32.00	183.16
SS 31 x FD 1693	10.80	23.64	8.98	8.91	2.93	31.75	166.66
SS 31 x FD 1694	9.39	20.40	9.98	9.31	2.83	30.03	133.33
SS 33 x FD 1690	10.00	26.85	9.61	9.84	2.71	29.61	150.00
SS 33 x FD 1691	8.30	27.40	9.93	8.33	2.49	30.62	166.33
SS 33 x FD 1692	8.39	24.05	9.37	9.41	2.50	30.21	33.66
SS 33 x FD 1693	9.10	25.33	10.28	9.02	2.52	30.61	166.66
SS 33 x FD 1694	9.80	21.08	9.51	9.00	2.45	31.47	133.16
SS 44 x FD 1690	11.00	24.67	9.18	10.30	2.62	32.00	66.66
SS 44 x FD 1691	10.80	20.67	9.25	9.78	2.61	31.94	50.16
SS 44 x FD 1692	12.10	19.67	9.60	9.84	2.74	30.01	33.16
SS 44 x FD 1693	10.40	21.43	9.46	9.43	2.83	31.60	66.66
SS 44 x FD 1694	10.10	24.47	9.34	10.42	3.01	31.95	83.49
CO 27 x FD 1690	8.30	26.50	9.07	9.81	2.65	30.06	66.49
CO 27 x FD 1691	7.80	24.69	9.19	9.72	2.88	31.09	50.16
CO 27 x FD 1692	7.40	15.04	10.06	8.98	2.58	31.30	100.00
CO 27 x FD 1693	6.60	26.30	9.18	9.43	3.00	30.00	50.16
CO 27 x FD 1694	7.00	24.77	9.30	9.71	2.78	30.41	83.33
Mean of lines	12.00	20.41	8.97	9.63	2.35	31.98	96.52
Mean of testers	6.26	25.20	6.68	8.04	2.69	35.08	39.19
Mean of parents	9.39	22.59	7.93	8.91	2.50	33.39	70.46
Mean of hybrids	9.35	23.00	9.59	8.99	2.66	31.13	86.67
SED	0.15	2.21	0.18	0.08	0.16	0.13	0.24
CD at 5 percent level	0.31	4.47	0.37	0.16	0.33	0.27	0.48

first followed by SS 30 X FD 1694 among the hybrids.

CO 27 recorded the least percentage of crude fibre content followed by SS 33.

The pollen parents *S.halepense* had high crude fibre values than the ovule parents. All the hybrids involving CO 27 and SS 33 registered low crude fibre. High crude fibre content reduces the digestibility of the fodder. Regarding the HCN content, SS 30, FD 1691 and FD 1694 recorded the least amount of HCN among the parents. Hydrocyanic acid content has been found to be a hereditary character, influenced by environmental condition (Boyd *et al.*, 1938). All the parents and hybrids had HCN content below 200 ppm. The toxic level of hydrocyanic acid has been reported to be 200 ppm (Gillingham *et al.*, 1969 ; Parasad, 1987). All the parents and hybrids in the present study recorded HCN content below the toxic level and worthy of utilisation in the hybridisation programme.

REFERENCES

AOAC, (1970). **Official Methods of Analysis** (11th ed) Association of Official Agricultural chemists. Washington, D.C.

BOYD, F.T., AAMODT.O.S., BEBSTEDT, G. and TRUOG.E (1938). Sudangrass management for control of cyanide poisoning. **J.Amer. Soc. Agron., 30**: 569-582.

GILLINGHAM, J.T., M.M.SHIVER, J.J. STARNES, N.R. PAGE and Mc GLAIN, E.F. (1969). Relative occurence of toxic concentration of cyanide and nitrate in varieties of sudangrass and sorghum sudan grass hybrids. **Agron.J., 61** : 727-730.

GOERING, H.K. and VANSOEST, P.J. (1970). Forage fibre analysis. **Agriculture Hand Book,** No.397, USDA.

HOGG, P.G. and AHLGREN.H.L. (1942). A rapid method for determining hydrocyanic acid content of single plants of sudangrass. **J.Amer.Soc.Agron., 34** : 199-200.

HUMPHRIES, E.C. (1956). **Modern Methods of Plant Analysis.**. Springer Verlag, Berlin. 468-502.

MINSON, D.J. (1975). Pasture management and animal nutrition. **Forage Res., 1:** 1-10.

PANSE V.G. and SUKHATME.P.V. (1967). **Statistical Methods for Agricultural Workers.** 2ndEd., I.C.A.R., New Delhi. 381. pp.

PRASAD, J. (1987). Animal health problems associated with forage based diet. Indian grassland and Fodder Research Institute, Jhansi. 18. pp.

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SEED PELLETING AND SOIL TYPES ON GERMINATION AND VIGOUR OF SEEDS IN ASH GOURD AND RIBBED GOURD

J.RENUGA DEVI and JACULINE A. SELVARAJ

Department of Seed Technology, Agricultural College and Research Institute
Tamil Nadu Agricultural University, Coimbatore 641 003.

ABSTRACT

A study on seed pelleting in ash gourd *(Benninhasa hispida* and ribbed gourd *Luffa acutangula* indicated that pelleting with *arappu* powder *(Albizia amara)* was found to be the best pre-sowing seed management practice, as it enhanced field emergence besides including early seedling vigour in sandly loam soil at 60 per cent water holding capacity.

KEY WORDS : Pelleting, Soil Types, Seed Vigour, Gourds

Ash gourd and ribbed gourd are the two important cucurbitaceous vegetables being extensively grown in the tropics. In general cucurbitaceous seeds are sensitive to soil moisture. Either a little, high or low moisture results in poor emergence.

According to Miller and Bensin (1974). pelleted seeds perform differently depending upon the hydrophilic or hydrophobic properties of the coating material on seed and soil water content. Hence, studies were undertaken in ash gourd and ribbed gourd to standardise the pelleting technique for improving germination and vigour of seeds as influenced by soil types at different water holding capacities

MATERIALS AND METHODS

Two month old seeds of ash gourd cv. COI and ribbed gourd v. CO 1 were pelleted with *arappu* powder @ 500g/kg of seed (T1), *arappu* powder + DAP @ 70g/kg. (T2), *arappu* powder + carbendazim @ 2g/kg (T3) and *arappu* powder +