Table 3 :   Persistence of Atrazine in black soil

Days after application	Dose kg/ai/ha	Quantity of Atrazine remained in soil (ppm)
10	0.25 kg ai/ha	0.650
20	"	0.520
30	"	0.261
40	"	0.080
50	"	0.032
60	"	ND

REFERENCES

ANON; 1964. 'Analytical method for pesticides, plant growth Regulators and Food additives' (Sweig, 6, ed.) Vol. 4, p. 219-224 Academic Press, 1964.

HOSKINS, W. M. 1961. Methods of expressing the insecticidal residue on plants. Final report. Regional Project. W. 45. USDA.

ROHDE, W. A.; L. E. ASMUSSEN, E. W HAUSUR, M. L. HESTER and H.D. ALLISOM, 1981. Atrazine persistence in soil and transport in surface and sub-surface run off from plots in the coastal plain of the Southern U. S. A, 'Agro-ecosystem (1981) 7(3), 225-238.

PHENOTYPIC STABILITY FOR CANE YIELD IN SUGARCANE

D. P. DESWAL and R. S. SANGWAN

Thirteen varieties of sugarcane including four released varieties (Co 1148, Co 1158, Co 7717 and Co 7314) were investigated for G x E interaction for cane yield during three successive years (1979 through 1982). The mean squares due to genotype, environment and G x E interaction were found highly significant. Co 7314 was the highest yielder in each year. On the basis of regression coefficient and deviation from regression, Co 1148 was found the most desirable variety. This variety was also second highest cane yielder over the years.

Before releasing a variety for general cultivation, it has to be grown in a wide range of environments, so as to ensure the stability of its performance. The performance of the genotypes differs in various environments due to genotype and environmental interaction (G x E). To determine the stability of a variety various parameters like mean (x) regression coefficient (b) and deviation from regression ($\bar{s}d^2$) have been used by different workers (Finley and wilkinson, 1963; Eberhart and Russel, 1966; Perkins and Jinks, 1968; Freeman and Perkins, 1971). Present study was carried out to identify high yielding and stable genotypes in the present sugarcane germplasm.

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MATERIALS AND METHODS

Nine genotypes were evaluated for cane yield and its stability against the recommended varieties for Haryana State during 1979 to 1982 in randomized block design with three replications at Regional Research Station Karnal (Haryana). All genotypes were planted in plots of 6 rows of 10 meter length spaced at 90 cm apart in February every year. All the recommended package of practices were followed for growing a good crop. Stability estimates for cane yield were studied using the method suggested by Eberhart and Russel (1966).

RESULTS AND DISCUSSION

The mean square due to genotypes and environments were highly significant indicating diversity among the genotypes and the environments (Table 1). The mean squares due to genotype environment interaction (G x E) was also highly significant which revealed the differential response of genotypes in different environments. Significant values of pooled deviation indicated the importance of non-linear component. G x E (Linear) was highly significant only when tested against pooled error and not against pooled deviation. It indicated a lesser contribution of linear regression and also difficulty in predicting the performance. Though linear and non-linear components contributed significantly a major portion towards G x E interaction was contributed through environmental (Linear) component. In the present study, G x E interaction was of low magnitude due to several reasons. One of the major reasons was the inclusion of the well established plant material in the experiment which included most of the high yielding varieties in this environment. The other reasons for low G x E might be attributed to common (heritage in one or both parents, and elasticity of the clones (heterozygous populations) included in the present studies.

Mean performance and parameters of stability (b and $\bar{s}d^2$) of thirteen sugarcane varieties have been presented in Table 2. The recently released and early maturing variety Co 7314 out yielded (391.11 q/ha) all other varieties in each year. However Co 1148 a late maturing variety compared (340.33) q/ha very well with Co 7314. The

Table 1 : Analysis of variance for cane yield in sugarcane

Source	d. f.	M. S.
Environments	2	2338.0933**
Genotypes	12	14771.3947** ++
Genotypes x Environments	24	1498.3031**
Environment x (Genotype x Environment)	26	1562.8850
Environment (linear)	11	4676.1866**
Genotype x Environment (linear)	12	1591.8399**
Pooled deviations	13	1296.6721*
Pooled error	78	523.8656

*P = 0.05
**P = 0.01 } Against pooled error

±+P — 0.01 Against pooled deviations

Table 2. : Cane yield (q/ha) and parameters of stability (b and sd' of thirteen varieties

Variety	Environments			Mean	bi	$\overline{sd}^1$
	E_1 1979-80	E_2 1980-81	E_3 1981-82			
1. Colk 7701	306.22	242.00	299.66	282.66	0.5376	1860.2188**
2. Colk 7702	124.33	216.00	121.66	154.00	-0.3299	4609.7954**
3. Colk 7707	233 33	234.00	323.00	263.44	3.7657	-306.7656
4. Colk 7708	235.33	286.00	311.66	277.66	2.5401	171.3798
5. Colk 7710	97.66	187.00	185.66	156 88	2.5134	2465.1062**
6. Cos 758	261.66	221.33	178.00	220.33	-2.9860	-231.7981
7. Cos 767	320.00	336.66	363.00	339.89	1.5888	-449.2385
8. Cos 770	244.33	232.00	218.66	231.66	-0.9168	-496.7309
9. Cos 771	312.66	242.00	350.66	301.77	2.6380	3239.0409**
10. Co 1148	338.66	341.33	341.00	340.33	0 0630	-521.0531
11. Co 1158	231.33	258.66	336.33	275.44	4 0569	-512.5618
12. Co 7717	334.66	296 66	351.83	327.55	1.2064	522.5623
13. Co 7314	387 66	406.66	379.00	391.11	-0 6169	-260 4670
Mean	267.69	269.28	289.21	274.06	S.E. (b) = 1.898	
C D. at 5%	59.51	78.59	60.58			

* Significant at 5%   **Significant at 1%

varieties COS 767 and Co 7717 also gave high yield over the years.

The term stability has been defined in different ways. Breese (1969), Samuel et al. (1970) and Jatasre and Paroda (1979a, b) considered deviations around the regression lines ($\overline{sd}^1$) as measure of stability. Genotypes with lowest standard deviations being the most stable and vice-versa. Therefore, Colk, 7701, 7702, Colk 7710 and CoS 771 were found the non-stable while rest of the varieties were found stable.

The most desirable genotype on the basis of regression coefficient and deviation from regression was Co 1148, having b = 0.063 and $\overline{sd}^1$ = —521.0531.

This variety is second highest yielder over the years. The early maturing varieties Co. 7717 and Co. 7314 were found stable though the genotype Colk 7708 was found most stable as having the least value of $\overline{sd}^1$ = 171.3798 but responsive to high fertility management conditions as b is higher (2.54). The variety Cos 767 which as third highest yielder was (b 1.59 and $\overline{sd}^1$ = —449.2385) found stable and responsive.

REFERENCES

BREESE, E. L. 1969. The measurement and significance of genotype-environment inter-action in grasses. *Heredity.* 24 : 27-44.

EBERHART, S. A. and W. A. RUSSELL, 1966. Stability parameters for comparing varieties *Crop Sci.* 6 : 36-40.

FINLEY, R. W. and G. N. WILKINSON, 1963. The analyses of adaptation in a plant breeding programme. *Aust. J Agric. Res. 14 :* 742-754.

FREEMAN, G. H. and J. M. PERKINS, 1971. Environmental and genotype environmental components of variability VIII, Relatives between genotypes grown in different environments and measure of these environments. *Heredity 26 :* 15-23.

JATASRA, D. S. and R. S. PARODA, 1979 a. Stability analysis for synchrony traits in wheat. (*T. aestivum.* L.) *Indian J. Genet.* 39 : 379-382.

JATASRA, D. S. and R. S. PARODA, 1979 b. Regression analysis of general adaptation for grain yield of different generations in wheat. *Genet. Agr. 33* : 231-236

PERKINS, J. M. and J. L. JINKS, 1968. Environmental components of variability III multiple lines crosses. *Heredity 23* : 339-356.

SAMUEL C. J. A,, J. HILL, E. L. BREESE and A. DAVIS, 1970. Assessing and predicting environmental response in *Lolium perenne. J. Agric. Sci.* (Camb.) 75 : 1-9.

PULSATING IRRIGATION – THE HEART FOR THE PLANTS

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An indegenous pulsating irrigator has been designed and applied for two crops, names maize and radish. There were five treatments for either of the crops, pulsating irrigation coupled with mulching is more effective in conserving moisture. On the other hand the same irrigation without mulch is poorer as evidenced by decrease in the yield. The details of the design and experiment are presented in this paper.

It is an obvious fact that plant also has life and is a living organism like the mankind. It needs a continuous supply of water and nutrient foods for its survival and growth. It transpires, as the human being does, for maintaining its temperature and for its physiological needs. The efficient use of water by the plants needs its delivery in required quantity at a closer intervals of time

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