Character association and path analysis in potato (*Solanum tuberosum* L.)

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SUMMARY

An experiment on correlation and path analysis involving eighteen genotypes of potato (*Solanum tuberosum* L.) was conducted under four different environments in rabi 1999-2000. The result indicated positive significant association of the quantitative traits with total tuber yield. Selection for total tuber yield improvement based on plant height, number of branch per tuber, number of tuber per plant and tuber yield per plant has been suggested.

Key words : Potato, Correlation, Path coefficient

Correlation coefficient analysis measures the mutual relationship between two plant characters and determined component characters in which selection can be based for genetic improvement in yield. Whether the association of these characters due to their direct effect on yield or is a consequence of their indirect effects via other component characters, may be answered through path coefficient analysis. The present study was therefore undertaken to find out the relative importance of degree of association different yield contributing traits and direct and indirect effects on the yield.

MATERIALS AND METHODS

Eighteen genotypes of potato were used for the present study. These genotypes were planted in randomized block design with three replications in four environments keeping a net plot size 3.0 x 2.4 m. Row to row spacing was kept 60 cm and that for plant to plant was 20 cm. Observations were recorded on five randomly selected plants for all traits like emergence per cent, plant height, number of branches per tuber, number of tuber per plant, tuber yield per plant, percent marketable yield, harvest index, tuber uniformity, dry matter percent, total sugar, total starch and total tuber yield. Mean values were subjected to analysis of variance and phenotypic correlation and path coefficient was computed by using the formula of Dewey and Lu (1959).

RESULTS AND DISCUSSION

The analysis of variance indicated highly significant differences among the genotypes for all the characters. The phenotypic correlation coefficient between total tuber yield and ten other metric traits on Pooled basis are presented in Table 1 showed significant and positive correlation with plant height, number of branch per tuber, number of tuber per plant and tuber yield per plant. Similar results were also reported by Dyal and Sharma (1982); Sandhu and Kang (1998) and Luthra (2001). Harvest index

Table 1 : Phenotypic correlation coefficients between different traits in potato

Characters	Plant height (cm)	No. of branch per tuber	Number of tuber per plant	Tuber yield per plant (g)	Per cent marketable yield	Harvest index	Tuber uniformity	Dry matter per cent	Total sugar	Total starch	Total tuber yield
Emergence per cent	0.02	0.12	0.03	-0.09	0.004	-0.18	0.39	-0.19	-0.002	-0.03	-0.07
Plant height (cm)		0.18	0.57*	0.59*	0.06	0.45	0.05	0.33	-0.04	0.10	0.60**
No. of branch/tuber			0.52*	0.40	-0.04	0.02	0.16	-0.04	0.28	-0.13	0.46*
Number of tuber/plant				0.67**	0.02	0.27	-0.07	0.10	0.14	-0.27	0.69**
Tuber yield per plant					0.18	0.30	-0.06	0.13	0.10	-0.08	0.87**
Per cent marketable yield						-0.10	0.01	-0.07	-0.02	-0.11	0.34
Harvest index							-0.09	0.82**	0.28	0.69**	0.32
Tuber uniformity								0.09	0.07	0.20	-0.08
Dry matter per cent									0.33	0.77**	0.19
Total sugar										0.35	0.07
Total starch											-0.04

* Significant at P = 0.05   ** Significant at P = 0.01

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