SHORT COMMUNICATION

Estimates of Variability Parameters in Strawberry (*Fragaria ananassa* Duch)

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Thirteen genotypes selected for variability parameters showed significant differences and a broad range of variation for all the traits studied. High heritability coupled with high genetic gains as observed for fruit weight/plant, number of fruits/plant, number of flowers/plant, number of marketable fruits/plant, pedicel length, fruit size, berry weight, plant genetic effects in the control of these traits. Contrary to it, soluble contents, titratable acidity showed comparatively low values of genotypic, phenotypic coefficients of variation and expected genetic gains, suggesting that phenotypic selection for these traits might not be rewarding.

Key Words: *Fragaria ananassa*, **Heritability, Strawberry,Variability**

The success of any crop improvement programme is directly dependent on the amount of genetic variability present in a crop. The coefficient of variability measures the extent of variation present among the genotypes within a particular trait, whereas the role of heritability coupled with genetic gains is very prominent in predicting the breeding value of an individual as well as predicting the genetic improvement expected in next generation as a result of the adoption of a particular scheme of selection. Galleta and Mass (1990) also emphasized the partitioning of a character into their components before selection. This study estimated the coefficient of variation, heritability and genetic gains in 13 genotypes of strawberry for prediction of selecting components of improvement for the next generation.

The experimental material comprised 13 genotypes (cultivars/hybrid/open-pollinated seedling selections) was grown on raised beds in a randomized block design with three replications during planting season, 1999. The experimental site was located at 1200 m above mean sea level and situated at 31°N latitude and 77°E longitude. The plot size was 2 x 1.6 m with spacing 50 x 40 cm between row to row and plant to plant, respectively. Observations were recorded on five randomly selected plants in each replication for growth and yield characters as per the standard procedure.

The analysis of variance was performed as per the method suggested by Panse and Sukhatme (1961). The variability parameters were determined as per the methodology suggested by Burton and de Vane (1953) and Johnson *et al.* (1955).

Results have been presented in Table 1. Analysis of variance showed significant mean sum of squares for all the traits, suggesting the presence of diversity among the genotypes assessed. The estimated of GCV were slightly lower in magnitude than the magnitude of phenotypic coefficient of variability (PCV) due to partial interaction of the genotypes with the environment or other environmental factors influencing the expression of these characters. As all the traits showed a narrow difference between GCV and PCV, phenotypic selection could be made effectively. Highest GCV and PCV for traits like fruit weight/plant, number of fruits/plant and number of flower/plant indicated the presence of diversity and offer good scope of enhancing productivity by selecting individuals for these traits.

However, estimate of heritability coupled with genetic gains would be useful for selection (Johnson *et al.*, 1955). The traits *viz.*, fruit weight/plant, number of fruits/plant, number of flowers/plant, number of marketable fruits/plant, pedicel length, fruit size, berry weight, plant height and leaf area studied in the present investigation showed high heritability (>90%) alongwith high expected genetic gains. The occurrence of such might be due to the presence of additive gene action (Panse, 1957). The above results are in agreement with the findings of Lal and Seth (1979). Spangelo *et al.* (1971) also reported high heritability estimates for average berry weight, number of berries/flower stem and yield/flower stem.

Contrary to it, total soluble contents, titratable acidity, pedicel thickness and leaf area showed comparatively low values of GCV, PCV and expected

Table 1. General mean, range and variability parameters for fruit yield and other traits in strawberry

Trait	Range	Mean	Mean sum of squares (12 d.f.)	GCV (%)	PCV (%)	Heritability (broad sense) (%)	Genetic advance	Genetic gain (%)
No. of flowers/plant	5.68-19.80	9.90	63.00*	45.95	47.01	95.6	9.16	92.8
Plant height (cm)	14.37-27.93	17.05	38.08*	20.58	21.52	91.4	6.91	40.5
Plant spread (cm)	25.33-47.57	29.65	97.78*	18.71	20.30	85.0	10.54	35.5
Leaf area (cm^2)	45.53-78.13	65.53	342.70*	16.68	17.10	95.1	21.29	33.5
No. of fruits/plant	4.0-15.47	7.05	37.17*	49.46	50.84	94.6	6.99	99.2
No. of marketable fruits/plant	2.53-8.13	4.25	6.22*	33.49	34.61	93.6	2.84	66.8
Fruit size (cm)	4.40-9.07	6.90	5.98*	20.32	20.78	95.7	2.83	41.0
Pedicel length (cm)	2.67-6.67	5.01	4.56*	24.22	25.40	90.9	2.38	47.5
Pedicel thickness (cm)	0.91-1.35	1.15	0.06*	12.18	14.25	73.0	0.25	21.7
Berry weight (g)	4.23-8.77	6.38	4.59*	19.20	19.75	94.5	2.45	38.4
Fruit weight/plant (g)	12.17-90.67	36.01	1621.40*	64.39	64.89	98.5	47.40	131.6
Total soluble solids (°Brix)	6.43-8.67	7.75	1.19*	7.83	8.67	81.6	1.13	14.6
Titratable acidity (%)	0.80-1.14	0.95	0.40*	11.34	13.25	73.2	0.19	20.0

genetic gains in the presence of high estimates of heritability (73-81.6%) giving an indication of non-additive gene action, suggesting that the phenotypic selection for these traits might not be rewarding.

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