

## CORRELATED RESPONSES IN YIELD AND CERTAIN COMPONENT CHARACTERS IN PEPPER (*Pipernigrum L.*)

In breeding of crop plants, it will sometimes be possible to achieve more rapid progress under selection for a correlated response than from selection for the desired character itself. Hence, it will be of advantage to examine such relationship existing among various characters.

Data available for 28 hybrid and open-pollinated lines of pepper over three seasons i. e., 1982, 1983 and 1984 were utilised to study the correlated responses in certain characters. Analyses were done according to Falconer (1960). Comparison of anticipated responses under direct selection and correlated responses showed that no correlated response for yield or any other character was superior or as good as the response under direct selection (Table 1). Apart from berry weight

Table 1  
Responses and correlated responses of characters under selection

	Spike number	Spike length (cm)	100 berry weight (g)	Berries per spike	Green yield (g)
Spike number	219.34	0.08	-1.07	1.80	875.241
Spike length	12.394	3.70	-0.315	8.65	625.172
Berry weight	-148.07	-0.27	4.63	-14.97	-650.179
Berries/spike	-42.51	1.24	-2.55	18.36	510.855
Green yield	194.15	0.85	-1.04	4.81	1072.440

Table 2  
Correlation coefficient, correlated response and relative efficiency of component characters

Component characters	Genotypic correlation coefficient with yield *	Correlated response in yield (g)	Relative efficiency over direct selection **
Number of spikes	0.850	875.241	0.82
Length of spike	0.366	625.172	0.58
100 berry weight	-0.369	-650.179	0.61
Berries/spike	0.353	510.855	0.48

\* all coefficients significant at 1% level

\*\* gain in yield b/ direct selection was estimated as 1072.440 g

the correlated responses in general were in the same direction as that of the character selected. Selection for bolder berries would result in the reduction of yield as well as its other component characters and vice versa. The farmer, will, however, prefer bold berries along with high yield as a character for his variety, as it brings higher price for the produce. Hence, the breeder, in evolving high yielding varieties, will have to look for the ones that combine boldness of berries as well, though such varieties will be relatively few.

Since the yield is a complex character of low heritability, it is sometimes possible that indirect selection based on component characters will bring about better results through correlated response. This is so, because discrimination of genotypes based on phenotypic performances will be less prone to error for component characters than yield. Such characters can be taken advantage of in improving yield, if those are highly correlated to yield. But in this case, none of the characters gave an improvement over direct selection of yield itself (Table 2). Values of relative efficiency were less than one here whereas superiority over direct selection should indicate value higher than one. This was because of the lack of high genetic association of component characters with yield (Table 2). As for number of spikes, genetic correlation with yield was high, but heritability was very low (0.28), thereby proving ineffective.

Correlated responses were assessed on the basis of heritability (broad sense) and hence relative efficiency over direct selection hold good on the assumption that the disturbances due to dominance and interaction components of variance were of equal proportion in all characters.

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#### Reference

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