

Correlation Between Growth and Yield Characters in Cardamom

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ABSTRACT

Twelve elite cardamom clones along with local check were assessed for growth and yield parameters. Product moment correlation coefficient was computed for different growth and yield parameters recorded on different days after planting. The observations where significant difference was observed among the clones were considered for correlation studies. It is suggested to record plant height, leaf area of index, leaf and total number of tillers on 360 days after planting. Observations on number of bearing tillers can be recorded after 390 days planting and number of panicles can be recorded after 420 days after planting as an early selection technique.

IDENTIFICATION and analysis of various growth and yield parameters contributing to the yield of cardamom aid in the improvement of cardamom (Madhusoodanan *et al*, 1994). Being a commercial crop, more attention has been paid for yield evaluation (George *et al.*, 1981). Information on evaluation of even important agronomic characters such as biomass production, leaf area, root distribution etc. in correlation with yield in cardamom is scanty. In cardamom, emphasis had been given earlier to isolate valuable gene resources for qualitative and quantitative characters such as high yield, bold size and dark green colour of capsule (Madhusoodanan, 1992). In view of the above facts, the present study was undertaken.

MATERIAL AND METHODS

At the Indian Institute of Spices Research, Cardamom Research Centre, Appangala in Coorg district of Karnataka, 12 elite clones along with local check were planted on 17th March, 1989 in a randomised block design and assessed for growth and yield

parameters. Product moment correlation coefficient (rp) was computed on different growth and yield parameters recorded on different days after planting. Parameters showing significant difference among the clones were chosen for computing product moment correlation coefficient. Observations recorded in 5 plants in each replication of each clone were used individually to obtain coefficient values.

RESULTS AND DISCUSSION

Plant height recorded on 360 and 510th days after planting (DAP) were significantly (at $P=0.01$) correlated with each other (Table I). Total tillers recorded on 360, 480 and 510th DAP were significantly (at $P=0.01$) associated among each other. Number of bearing tillers recorded on 360, 390, 420, 450, 480 and 510th DAP were significantly (at $P=0.01$) associated with each other (Table II). Number of panicles recorded on 360, 420, 450, 480 and 510th DAP were significantly (at $P=0.01$) associated with each other (Table III). Leaf area of index leaf recorded on 360, 450 and

TABLE I

Correlation coefficients computed among the observations recorded on different days after planting (DAP) on plant height and index leaf area

Characters	2	3	4	5
Plant height on 360 DAP	0.913**	0.691**	0.465**	0.297**
Plant height on 510 DAP		0.648**	0.453**	0.245*
Index leaf area on 360 DAP			0.674**	0.642**
Index leaf area on 450 DAP				0.762**
Index leaf area on 480 DAP				—

** Significant at P = 0.01

* Significant at P = 0.05

TABLE II

Correlation coefficients computed among the observations recorded on different days after planting (DAP) on number of bearing and total tillers

Characters	2	3	4	5	6	7	8	9
Total tillers on 360 DAP	0.855**	0.899**	0.385**	0.671**	0.709**	0.819**	0.821**	0.871**
Total tillers on 480 DAP		0.926**	0.352**	0.524*	0.643*	0.701**	0.706**	0.757**
Total tillers on 510 DAP			0.332**	0.529**	0.636**	0.705**	0.705**	0.771**
Bearing tillers on 360 DAP				0.600**	0.712**	0.511**	0.531**	0.521**
Bearing tillers on 390 DAP					0.824**	0.835**	0.802**	0.771**
Bearing tillers on 420 DAP						0.892**	0.835**	0.812**
Bearing tillers on 450 DAP							0.961**	0.918**
Bearing tillers on 480 DAP								0.967**
Bearing tillers on 510 DAP								—

** Significant at P = 0.01

TABLE III

Correlation coefficients computed among the observations on number of panicles recorded on different days after planting (DAP)

Characters	2	3	4	5
No. of panicles on 360 DAP	0.489**	0.505**	0.404**	0.342**
No. of panicles on 420 DAP		0.944**	0.902**	0.873*
No. of panicles on 450 DAP			0.957**	0.933**
No. of panicles on 480 DAP				0.984**
No. of panicles on 510 DAP				—

** Significant at P = 0.01

480th DAP were significantly associated among each other. Leaf area of index leaf recorded on 360th DAP was significantly correlated with plant height recorded on 360 and 510th days after planting.

Number of bearing tillers recorded on 360, 390, 420, 450, 480 and 510th DAP were strongly correlated (at P = 0.01) with total number of tillers recorded on 360, 480 and 510 days after planting. In similar other studies, Sudharshan *et al.* (1989), found that four most important characters directly contributing to yield in cardamom are the number of tillers/panicles per plant, number of panicles per tiller, number of racemes per panicle and number of capsules per raceme.

As the plant height on 360 DAP is strongly associated (rp = 0.913) with plant height on 510 DAP, it suggested to take observations on plant height at early stage. Similarly index leaf area recorded on 360 DAP was strongly associated with observations made on subsequent days *i.e.* 450 DAP (rp = 0.674) and 480 DAP (rp = 0.642). Observations on plant height and index leaf area can be recorded after 360 days after planting as an early selection technique.

Total tillers recorded on 360 DAP was strongly correlated with total tillers recorded at subsequent days *i.e.* 480 DAP (rp = 0.855) and 510 DAP (rp = 0.899) and hence total tillers can be recorded after 360 DAP as an early selection technique.

Bearing tillers are an important yield parameter. Bearing tillers recorded on 390 DAP was strongly correlated with observations recorded on subsequent days with higher coefficient values compared to bearing tillers recorded on 360 DAP. Hence it is

suggested to record bearing tillers after 390 DAP to get more precise total number of bearing tillers at an early stage.

Number of panicles which determines total number of capsules and yield is an important yield parameter. Number of panicles recorded on 360 DAP was correlated with subsequent observations with low rp values. Number of panicles recorded on 420 DAP was strongly correlated with subsequent days observations with high rp values *i.e.* 450 DAP (rp = 0.944), 480 DAP (rp = 0.902) and 510 DAP (rp = 0.873). Hence it is suggested to record number of panicles after 420 days of planting as an efficient early screening technique.

In conclusion, it is suggested to record plant height, leaf area of index leaf and total number of tillers after 360 days of planting and number of panicles after 390 days of planting and number of panicles after 420 days of planting as an efficient early selection technique in cardamom.

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