Journal of Spices & Aromatic Crops 3 (2) : 155-157, 1994

Correlations between biometrical characters in vanilla (*Vanilla planifolia* Andrews)

P G SANKARAN, K M KURUVILLA & K J MADHUSOODANAN

Indian Cardamom Research Institute
Myladumpara, Kailasanadu P.O., Idukki - 685 553, India.

ABSTRACT

A study was undertaken to find out the extent of association among growth attributes of vanilla (*Vanilla planifolia)* and to develop a model for determination of vine length based on biometrical observations. The characters, number of nodes, number of leaves and internodal length were significantly and positively correlated with vine length. The multiple regression equation derived exhibited a precision of 82.5 per cent.

Key words : correlation, multiple regression, vanilla, *Vanilla planifolia.*

Vanilla (*Vanilla planifolia* Andrews) (Orchidaceae) is mainly grown for pleasant flavour of its beans and is a major source of natural vanillin. *V. pompona* Schiede and *V. tahitensis* J.W. Moore also yield natural vanillin. However, *V. planifolia* is the most preferred commercially due to its superior quality of produce and hence is widely cultivated. The crop is vegetatively propagated through cuttings. Cuttings of 1 m length are generally preferred for planting (Sasikumar, Rema & Ravindran 1992). Determination of vine length is relatively easy in early stages of growth as it grows straight upwards along the support. However, when the vines attain sufficient length later, they are coiled/trailed on supports in the plantations to promote flower formation (George 1981). Therefore, measurement of vine length is a difficult task for research workers in vanilla. Besides, vanilla nursery owners find it difficult to know the number of cuttings that can be obtained from grown up plants. In the present study, an attempt was made to find out the extent of association between growth attributes of vanilla and to develop a model to determine vine length based on biometrical observations.

The experiment was carried out at the Indian Cardamom Research Institute Farm, Myladumpara (Kerala, India). One hundred plants were randomly selected and observations were made on characters such as vine length, total number of leaves, total number of nodes, length of internodes, leaf area (length × breadth) and girth of vine. For determining leaf area and internodal length, five leaves and internodes from

Table 1. Correlation coefficients among growth characters of vanilla

Character	No. of leaves	No. of nodes	Internodal length	Leaf area	Girth of vine
Vine length	0.872	0.886	0.723	0.149	0.293
No. of leaves		0.985	0.645	0.025	0.197
No. of nodes			0.647	0.039	0.214
Internodal length				0.422	0.334
Leaf area					0.534

the terminal portion of the vine were used and the average was calculated. The correlation coefficients were worked out among the growth characters. Non significant characters were not taken into account for developing the model. The observations indicated that number of nodes and leaves were on par and therefore, number of nodes was considered along with internodal length in determining vine length. The multiple regression equation suggested by Wonnacot & Wonnacot (1970) was employed in developing the model.

Correlation studies provide a measure of association between different variables and help in formulation of selection indices. The characters, number of nodes, number of leaves and internodal length were highly positively correlated with vine lenth. All these characters were also significantly and positively correlated with each other. However,

Table 2. Observed and calculated values of vine length in vanilla

Sl. No.	No. of nodes	Internodal length (cm)	Observed vine length (cm)	Calculated vine length (cm)	Accuracy (%)
1.	44	10.0	365	384.83	95
2.	41	7.7	272	311.45	86
3.	73	12.5	773	684.65	89
4.	59	9.9	470	511.00	92
5.	50	8.6	370	407.08	90
6.	38	7.2	238	275.43	85
7.	76	10.2	631	662.58	95
8.	51	8.8	403	419.78	96
9.	43	9.0	301	355.53	82
10.	66	10.7	564	587.45	96

traits such as leaf area and vine girth exhibited no significant correlation with vine length. There was a high positive corelation between number of nodes and number of leaves probably because each node corresponds to a leaf at the younger stage of the vine (Table 1).

The regression equation $Y = -198.87 + 8.55\ X1 + 20.75\ X2$ where, X1 and X2 represents number of nodes and internodal length, respectively, was developed. Analysis of the model revealed that two factors viz., number of nodes and internodal length together contributed around 82.5 per cent precision ($R^2 = 0.825$) to the model. This model was verified in the field with 10 observations which revealed a mean accuracy of 90.6 per cent (Table 2). In vanilla plantations, coiling/trailing of vines is a general practice and this leads to difficulty in ascertaining the length of vines. Recording number of nodes and internodal length is easy compared to determination of actual length; hence the model assumes great importance.

References

George C K 1981 Vanilla culture-a scientific approach. Indian Cocoa, Arecanut & Spices J. 4 : 1-4.

Sasikumar B, Rema J & Ravindran P N 1992 Vanilla. Indian Cocoa, Arecanut & Spices J . 16 : 6-11.

Wonnacot R J & Wonnacot T H 1970 Econometrics. John Wiley & Sons, London.