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Benefit cost ratio analysis in Turmeric (*Curcuma longa* L.) through extension approach

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A B S T R A C T

Turmeric (*Curcuma longa*), a flowering plant in the ginger family, is widely used as a food coloring in curry powder. Turmeric has long been used in both Ayurvedic and Chinese medicine an anti-inflammatory, to treat digestive disorders and liver problems. The active ingredient in turmeric is curcumin, which have been the various medicinal properties. To extract the curcumin, best variety should be selected. The ultimate aim of any programme is to obtain the high yield with quality and studies like correlation and path coefficient analysis to understand the association different characters and their final effect on the yield. The present study was attempted in this direction to analyze the association of different character on yield in Turmeric.

Introduction

Turmeric (*Curcuma longa L*), the ancient and sacred spice of India known as 'Indian Saffron', is an important commercial spice crop grown in India and mainly grown in Andhra Pradesh, Tamil Nadu, Karnataka, Odisha, West Bengal and Maharashtra [2,3]. In Tamil Nadu Erode, Karur, Salem, Pudukkottai, Coimbatore are the main district contributing Tamil Nadu s majore share.In pudukkotta Thirumayam is the only block in Tirumayam block cultivating in 21 ha with the production of 84.42 MT Turmeric for the local needs in green as much as fresh during festival season and commercially marketed in Erode district. KVK, Vamban, Pudukkottai conducted Front Line Demonstration on IISR Power MixT in Turmeric during 2015-16 to increase marketable rhizome in Turmeric.

In this context, the study has been conducted in Tirumayam block of Pudukkottai district with the following objectives mainly Benefit cost ratio analysis in Turmeric (*Curcuma longa* L.) through extension approach.

Materials and Methods

An investigation was carried out in the Department of spices and plantation crops, Horticultural College and Research institute, Coimbatore involving 50 genotypes namely

Bio Metric Characters

Height of the plant (cm)

Number of leaves per plant
Length of Leaf (cm)

Breathe of Leaf (cm)

Stem girth of plant (cm)

No. of mother rhizome

Mother rhizome weight (g)

Mother rhizome girth (cm)

No. of primary rhizome
Primary rhizome weight (g)

Primary rhizome girth (cm)

Primary rhizome diameter (cm)

Primary rhizome core diameter (cm)

No. of secondary rhizome

Secondary rhizome weight (g)

Yield of the plant (g).

Results and Discussion

The strength and discussion of association of these component characters with rhizome yield and inter associations are very useful for improvement of rhizome yield in Turmeric. Correlation coefficient is all most all the characters indicating the effect of environmental factors modifying the total expression of genotypes in Rhizome yield. The Rhizome yield was positively highly significant correlation with most of the characters like, Number of leaves per plant (.2577*), Length of Leaf (0.5568** cm), Breath of Leaf (0.2967 cm), Stem girth of plant (0.4805**cm), Primary rhizome weight (0.8199 g), Primary rhizome girth (0.5674cm), Primary rhizome diameter (cm), Primary rhizome core diameter (0.4887cm), No. of secondary rhizome(0.8744), Secondary rhizome weight (1.2755g). The residual effect was 0.4641; it indicated that the traits had a significant impact on yield contribution. Thus the, Number of leaves per plant Length of Leaf, Breath of Leaf, Stem girth of plant, Primary rhizome weight, Primary rhizome girth, Primary rhizome diameter, Primary rhizome core diameter, No. of secondary rhizome, Secondary rhizome weight, were the primary yield determinates that require a special emphasis in the selection programme.

Table.1

1.CL 2 ,	21.Suguna	41. Co 1
2.CL 15	22.Swarnar	42.Salem local
3.CL 22	23.Roma	43. JTS 2
4.CL 35	24.kalimpong	44.Rajendra Sonia
5.CL 41	25. Sikkim local	45.PTS 55
6.CL 42	26.Salem local	46.PTS 15
7.CL 43	27.AFT	47.PTS 17
8.CL49	28.PTS43	48.Sonali
9.CL 52	29.PTS 12	49.ER 209
10.CL 74	30.PTS 38	50.CL 2

Table.2 Path analysis

	Pl.ht(cm)	No.of.l	L.l (cm)	L.b (cm)	S.gr (cm)	No. m.r	M.r.w (g)	M.r.g (cm)	P.r.w (g)	N.p.r	P.r.g (cm)	P.r.d (cm)	P.r.c.d (cm)	S.r.no	S.r.w (g)	Yld (g)
Pl.ht (cm)	-0.2215	-0.1658	-0.209	-0.1985	-0.2812*	0.1914	0.0265	0.8106**	-0.1225	0.0393	0.0927	-0.0072	-0.0692	-0.0356	0.0304	0.4118**
No.of.l	0.363**	0.4849**	0.1475	-0.1189	-0.2863*	-0.077	0.0507	-0.5516**	0.0994	-0.0922	0.0171	0.159	0.3042*	0.1402	0.1758	0.2577
L.l (cm)	0.1068	0.0344	0.1131	-0.0056	0.1069	0.0087	0.0124	-0.4103	0.0464	-0.0315	0.0473	-0.0129	0.0432	0.0634	0.0497	0.5568**
L.b (cm)	0.1164	-0.0318	-0.0064	0.1298	0.1028	-0.0562	0.0159	0.0485	0.067	0.0202	0.0255	-0.0072	-0.0282	0.0159	-0.0009	0.2967*
S.gr (cm)	0.0014	-0.0007	0.001	0.0009	0.0011	0.0001	-0.0003	0.008	-0.0001	0.0001	0.0004	0.0002	-0.0008	-0.0005	0.0007	0.4805**
No.m.r	-0.4772*	-0.0877	0.0425	-0.2392	-0.0138	0.5523**	0.4879**	-0.461	-0.0854	0.1229	-0.0481	-0.157	-0.1688	0.061	0.208	-0.2603*
M.r.w (g)	0.0996	-0.087	-0.091	-0.1019	0.2037	-0.7354**	-0.8324**	0.7777**	-0.2602*	-0.0969	-0.4002**	0.1032	-0.1236	-0.2024	-0.2264	0.2622*
M.r.g (cm)	0.1844	0.0573	0.1827	-0.0188	-0.3619**	0.042	0.0471	-0.0504	-0.0286	0.0023	-0.0051	-0.0255	-0.0678	-0.048	-0.0432	0.2331
P.r.wt (g)	0.7204**	0.267**	0.5341**	0.6717**	-0.0842	-0.2015	0.407	0.7405**	1.3022**	0.8046**	0.5787**	0.207	0.8617**	1.0633	1.4918**	0.8199**
N.p.r	0.0192	0.0206	0.0302	-0.0169	-0.0133	-0.0241	-0.0126	0.0049	-0.0669	-0.1083	0.0484	-0.0125	-0.0199	-0.0547	-0.0666	0.3494*
P.r.g (cm)	-0.2243	0.0189	0.2239	0.1054	0.1793	-0.0466	0.2576	0.0548	0.2381	-0.2393	0.5358**	-0.2297	0.0332	0.1957	0.2448	0.5674**
P.r.d (cm)	-0.2275	0.2093	-0.0729	-0.0354	0.1337	-0.1815	-0.0791	0.3233*	0.1014	0.0735	-0.2737*	0.6383**	0.5103**	0.0691**	-0.0282	0.0368
P.r.c.d (cm)	-0.0425	-0.4569**	-0.2777	0.1579	0.556**	0.2224	-0.108	-0.9797**	-0.4814**	-0.1335	-0.045	-0.5816**	-0.7275**	-0.428**	-0.357**	0.4887**
S.r.no	-0.0425	-0.0763	-0.1479	-0.0324	0.1164	-0.0292	-0.0642	-0.2514	-0.2155	-0.1332	-0.0964	-0.0286	-0.1553	-0.2639*	-0.3998**	0.8744**
S.r.wt (g)	-0.0271	0.0715	0.0867	-0.0014	0.1212	0.0743	0.0537	0.1693	0.226	0.1213	0.0901	-0.0087	0.097	0.2989*	0.1973	1.2755**

* Significant @ 5 % ** Significant @1 % Residual effect 0.4641

Table.3 Correlation coefficient

	Pl.ht (cm)	No. of.l	L.l (cm)	L.b (cm)	S.gr (cm)	No.m. r	M.r.w (g)	M.r.g (cm)	P.r.w (g)	N.p.r	P.r.g(cm)	P.r.d(cm)	P.r.c.d (cm)	S.r.no	S.r.w (g)	Yld (g)
Pl.ht (cm)		0.7486 **	0.9439 **	0.8965	1.2697 **	-0.8641 **	-0.1196	-3.6604**	0.5532 **	-0.1773	0.4187**	0.0324	0.3126*	0.1609	-0.1373	0.4118**
No.of.l			0.3042 *	-0.2451 **	-0.5905 **	-0.1587	0.1045	-1.1374**	0.2050	-0.1900	0.0352	0.3278*	0.6281**	0.2891*	0.3626 **	0.2577*
L.l (cm)				-0.0493	0.9445 **	0.0769	0.1094	-3.6268**	0.4101 **	-0.2784*	0.4179**	-0.1142	0.3817**	0.5602**	0.4397 **	0.5568**
L.br (cm)					0.7923 **	-0.4331 **	0.1224	0.3734	0.5158 **	0.1558	0.1967	-0.0555	-0.2171	0.1228	-0.007	0.2967*
S.g(cm)						-0.025	-0.2447	7.1841**	-0.0646	0.1224	0.3346*	0.2095	-0.7643**	-0.44**1	0.6142 **	0.4805**
No.m.r							0.8834 **	-0.8347**	-0.1547	0.2226	-0.087	-0.2843*	-0.3057*	0.1105	0.3766 **	-0.2603*
M.r.w (g)								-0.9343**	0.3126 *	0.1164	0.4808**	-0.1239	0.1485	0.2431	0.272*	0.2622*
M.r.g (cm)									0.5686 **	-0.0448	0.1022	0.5065**	1.3467**	0.9527**	0.8581 **	0.2331
P.r.wt (g)										0.6178**	0.4444**	0.1589	0.6617**	0.8165**	1.1455 **	0.8199**
N.p.r											-0.4467**	0.1152	0.1835	0.5046**	0.6149 **	0.3494*
P.r.g (cm)												-0.4288**	0.0619	0.3653**	0.4569 **	0.5674**
P.r.d (cm)													0.7994**	0.1082	-0.0442	0.0368
P.r.c.d (cm)														0.5883**	0.4918 **	0.4887**
S.r.no															1.5149 **	0.8744**
S.r.wt (g)																1.2755**

* Significant @ 5 % ** Significant @1 %

Thus the rhizome yield per plant in Turmeric is a function of number of characters and emphasis should be given plant height, leaf length, mother rhizome weight, mother rhizome diameter, mother rhizome core diameter and all other significant characters in the selection programme.

The Rhizome yield was positively significantly correlated with characters like, Number of leaves per plant Length of Leaf, Breath of Leaf, Stem girth of plant, Primary rhizome weight, Primary rhizome girth, Primary rhizome diameter, Primary rhizome core diameter, No. of secondary rhizome, Secondary rhizome weight, all these traits were taken for calculating yield. All These characters are highly positive significant for most of the characters to increase the yield. This indicates that the yield in turmeric was influenced by each trait. Therefore selection should be done based on these traits.

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