



Short communication

## Evaluation of turmeric (*Curcuma longa* L.) varieties for rainfed cultivation

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### ABSTRACT

Field experiments were carried out for two years at Agricultural Research Station, Seethampeta, Srikakulam Dist., Andhra Pradesh, to identify suitable turmeric cultivars for tribal areas of North Coastal Andhra Pradesh for rainfed cultivation. Ten cultivars were screened for their performance for comparison with the most popular local cultivar, 'Seethampeta local'. All the cultivars tested outperformed the local cultivar. Cultivars PTS-24 and CLL-326 were better in terms of plant height (93.43cm and 92.70cm, respectively) and mean number of tillers / plant (2.16 and 2.21 respectively). Per cent curing was highest in PTS-38 (28.5), followed by PTS-24 (25.7) and CLL-326 (25.2). Cultivars PTS-24 and CLL-326 recorded highest mean yield of both fresh and cured rhizomes. Yield of fresh rhizomes was positively correlated to number of tillers and number of leaves, while, yield of cured rhizomes was significantly influenced by per cent curing and number of leaves. Cultivars PTS-24 and CLL-326 recorded highest mean yield (23.08 t ha<sup>-1</sup> and 22.93 t ha<sup>-1</sup>, respectively) and were identified as suitable varieties for rainfed cultivation in tribal areas of North Coastal Andhra Pradesh.

**Key words:** Turmeric, tillers, rhizome, curing, rainfed cultivation

Turmeric (*Curcuma longa* L.) is one of the most important spice crops grown in Andhra Pradesh. It is a major cash crop cultivated in high-altitude and tribal areas of North Coastal Andhra Pradesh, and is mainly grown on hill slopes under rainfed conditions. During harvest season, fresh as well as cured rhizomes are marketed on weekly shandy days. However, due to lack of knowledge, tribal farmers grow only the local variety and that too without proper fertilization, leading to poor harvest. Hence, an investigation was launched to study performance of some improved cultivars for yield potential and yield attributing characters, to identify a better variety for commercial cultivation in this region.

Field experiments were conducted for two consecutive years during 1997 and 1998 at Agricultural Research Station, Seethampeta, Srikakulam (Dist.,) which falls under the High Altitude and Tribal Zone (HAT) of Andhra Pradesh. Seethampeta is located at an elevation of 400m above MSL, with average rainfall of 1280mm (contributed from the South West and North East monsoons). Turmeric is generally planted during the second fortnight of May, or the first week of June, to coincide with onset of early monsoon showers.

The experiment was conducted in Randomized Block

Design with ten cultivars, viz., PTS-9, PTS-24, PTS-38, CO-1, BSR-1, CLI-317, CLL-324, CLL-325, CLL-326 and Local, and replicated thrice. Selected primary-finger rhizomes were planted during the first fortnight of June in both the years of study. These were planted at 45cm x 15cm in a plot of 3m x 1.5m. N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O were applied as per recommendations and normal cultural practices / plant protection measures were followed for raising a successful crop.

Observations on plant height, number of tillers and number of leaves per plant were recorded on ten randomly selected plants from each plot on the 180<sup>th</sup> day after planting. Rhizome yield was estimated and expressed as tonnes ha<sup>-1</sup>. Per cent curing was evaluated by boiling and drying a sample of 2kg of fresh rhizomes from each plot. Yield of cured rhizomes was worked out based on curing percentage and was expressed as tonnes ha<sup>-1</sup>. Data were statistically analyzed as per standard procedures (Gomez and Gomez, 1984).

Significant differences among cultivars were observed for all the characters studied during both the years of study (Table 1). All the cultivars were found to be superior to the local variety.

Cultivars PTS-24, CLL-324 and CLL-326 recorded

Table 1. Mean performance of turmeric varieties during the years 1997 and 1998

Variety	Plant height (cm)			No. of tillers/plant			No. of leaves/plant			Yield (kg/plot)			Per cent curing			Estimated yield (t ha <sup>-1</sup> )								
	1997		Mean	1997		Mean	1997		Mean	1997		Mean	1997		Mean	1997		1997		1997		1997		
	1997	1998	Mean	1997	1998	Mean	1997	1998	Mean	1997	1998	Mean	1997	1998	Mean	1997	1998	Mean	1997	1998	Mean	1997	1998	Mean
PTS-9	79.57	84.20	81.88	1.20	1.50	1.35	18.16	18.17	18.16	6.21	7.21	6.71	26.5	24.5	25.5	13.81	16.01	14.91	3.56	3.93	3.74			
PTS-24	91.27	95.60	93.43	2.13	2.20	2.16	24.16	24.07	24.11	10.87	9.91	10.39	27.0	24.5	25.7	24.15	22.01	23.08	6.53	5.38	5.95			
PTS-38	82.83	85.60	84.21	1.76	1.80	1.78	19.03	18.67	18.85	7.83	7.11	7.47	30.0	27.0	28.5	17.41	15.79	16.60	5.23	4.26	4.74			
CO-1	80.27	84.27	82.27	1.76	1.77	1.76	19.93	18.53	19.23	10.47	7.27	8.87	23.5	21.5	22.5	23.26	16.17	19.71	5.46	3.47	4.46			
BSR-1	78.37	83.13	80.75	1.63	1.70	1.66	21.03	20.57	20.80	9.80	7.28	8.54	26.0	22.0	24.0	22.89	16.17	18.97	5.66	3.55	4.60			
CLI-317	91.00	93.40	92.20	1.97	1.90	1.93	21.0	19.83	20.41	10.06	7.39	8.72	25.5	22.0	23.7	22.37	16.42	19.39	5.70	3.61	4.65			
CLL-324	90.27	95.53	92.90	2.23	2.30	2.26	22.86	21.67	22.26	10.30	8.22	9.26	26.0	22.0	24.0	22.89	18.27	20.58	5.95	4.02	4.98			
CLL-325	82.47	86.03	84.25	1.70	1.80	1.75	20.66	19.80	20.23	9.30	6.96	8.13	24.0	24.0	24.0	20.67	15.47	18.07	4.97	3.71	4.34			
CLL-326	90.50	94.90	92.70	2.13	2.30	2.21	24.63	22.93	23.78	10.22	10.43	10.32	26.5	24.0	25.2	22.71	23.16	22.93	6.01	5.56	5.78			
Local	76.43	83.23	79.83	1.90	1.90	1.90	20.06	21.0	20.53	7.75	6.11	6.93	22.5	21.0	21.7	17.22	13.58	15.40	3.88	2.86	3.37			
S.Ed.	2.57	2.33	1.76	0.21	0.18	0.14	1.04	1.18	0.78	0.41	0.26	0.24	1.59	1.21	0.95	0.92	0.59	0.53	0.43	0.28	0.25			
C.D ( <i>P</i> =0.05)	5.41	4.91	3.57	0.45	0.38	0.29	2.20	2.48	1.59	0.86	0.55	0.49	3.35	2.54	1.93	1.92	1.24	1.07	0.91	0.58	0.52			

**Table 2. Correlation coefficient of yield and yield attributing characters in turmeric**

	Plant height	No. of tillers	No. of leaves	Per cent curing	Yield of fresh rhizomes
No. of tillers	0.450				
No. of leaves	0.653**	0.776**			
Per cent curing	0.380	0.029	0.501*		
Yield of fresh rhizomes	0.455	0.644**	0.735**	0.052	
Yield of cured rhizomes	0.386	0.592**	0.726**	0.542*	0.864**

\*\*Correlation significant at 0.01 level

\*Correlation significant at 0.05 level

the tallest plants, with highest number of tillers and leaves in these were found to be the most vigorous. Cultivation PTS-24 had the tallest plants (93.43cm) with highest number of leaves (24.11 per plant), closely followed by CLL-324 (92.9cm plant height). CLL-324 recorded maximum number of tillers per plant (2.26), followed by CLL-326 (2.21) and PTS-24 (2.16). The local cultivar recorded shortest (79.83cm) plants, with a mean of 1.9 tillers and 20.53 leaves per plant. Similar results have been reported earlier by Ramakrishna and Reddy (1992).

Yield per plot ranged from 6.71kg (PTS-9) to 10.39kg (PTS-24), whereas, per cent curing ranged from 21.7 (Local) to 28.5 (PTS-38). Though yield of fresh rhizomes in the local variety (15.40 t ha<sup>-1</sup>) was higher than in PTS-9 (14.91t ha<sup>-1</sup>), yield of cured rhizomes was relatively low in this variety (3.37t ha<sup>-1</sup>) owing to low curing percentage. Mean yield of fresh and cured rhizomes was highest in PTS-24 (23.08t ha<sup>-1</sup> and 5.95t ha<sup>-1</sup>, respectively) closely followed by CLL-326 (22.94 and 5.78t ha<sup>-1</sup>, respectively). These two cultivars were found to be consistent in their performance in both the years under study. Suitability of these cultivars to different agro-climatic zones (Pujari *et al*, 1987; Ramakrishna and Reddy 1992; Pruthi, 1998) and yield potential of long-duration cultivars released by Andhra Pradesh (Subbarayudu *et al*, 1976) have been earlier reported by many workers. These cultivars have been already recommended for commercial cultivation in Andhra

Pradesh (Chadha, 2001). Results in the present investigation are in conformity with those reported earlier. Correlation studies (Table 2) revealed fresh yield to be positively correlated to number of tillers and number of leaves, while yield of cured rhizomes was significantly influenced by per cent curing, yield of fresh rhizomes and number of leaves. These findings are in accordance with those reported by Indires *et al* (1996). Thus, superiority of cvs. PTS-24 and CLL-326 can be attributed to vegetative vigour and high curing percentage.

In view of yield potential and consistent performance of cv. PTS-24 and CLL-326, these two cultivars were concluded to be suitable for rainfed cultivation in the High-Altitude Tribal areas of North Coastal Andhra Pradesh.

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