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## Studies on varietal performance of growth and yield attributing trade in turmeric (*Curcuma longa* L.)

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### Abstract

An experiment was carried out with ten varieties of turmeric during Kharif session 2016 in Randomize Block Design (RBD) with three replications at Deendayal Research Institute Lal Bahadur Shastri, Krishi Vigyan Kendra, Gopalgram, Gonda (U.P.) under irrigated conditions. The ten varieties highly differed in their growth characters, production potential aspects. The observations were recorded attribute like Plant height (cm), number of leaves per plant, number of tillers per plant, leaf length (cm), leaf width (cm), number of rhizome per plant, length of rhizome per plant (cm) width of rhizome per plant (cm), fresh weight of rhizome per plant (gm), fresh weight of rhizome (q/ha), dry weight of rhizome (q/ha), curing percentage (%). The experimentation was revealed that, Variety Roma exhibited maximum value of plant height (111.16 cm), Leaf length (60.83 cm), leaf width (16.60 cm), number of rhizome per plant (15.22), Length of rhizome per plant (9.12 cm), weight of rhizome per plant (3.18 cm), Fresh weight of rhizome per plant (484.80 gm), Fresh weight of rhizome (306.95 q/ha), dry weight of rhizome (64.90 q/ha) and curing percentage (24.74%). On the basis of test performance, Roma is adjudged as a promising turmeric cultivar for general cultivation in area of North East region of Uttar Pradesh.

**Keywords:** Yield, varieties, turmeric, experiment

### Introduction

Turmeric (*Curcuma longa* L.) is one of the important spices crop in India and play a vital role in the national economy. India is a largest producer and exporter of turmeric in the world. In India turmeric is cultivating in area of 2.22 lakh hectares with 10.56 lakh ton production. The main growing states in India are Andhra Pradesh, Tamil Nadu, Karnataka, Maharashtra, Orissa and Kerala. Andhra Pradesh rank first in area and production. However the productivity and quality of the turmeric is not up to the expected level in Andhra Pradesh. It is a common practice to cultivate this crop in more than two to three cropping season in the same piece of land instead of single cropping season, owing to its poor productivity. Through wide genetic variability exists in their crop, not much work has been done on crop improvement through the selection of superior type with high yield in the agency arias. Where inferior local clones are under cultivation resulting in low productivity, thus making turmeric cultivation less remunerative.

### Materials and Method

The field experiment was conducted for one year (2016) at Deendayal Research Institute Lal Bahadur Shastri Krishi Vigyan Kendra, Gopalgram Gonda (U.P.). The trails were laid out in randomized block design (RBD) with three replications using ten varieties of turmeric viz. NDH-1, NDH-18, BSR-1, BSR-2, Roma, Suroma, Suranjana, IISR Pratibha, IISR Alleppy Supreme, Rajendra Sonia. The net plot size was 4 x 2 meter and rhizomes were planted in second week of April. The primary rhizomes were planted in beds with a spacing of 30 x 25 cm. Farm yard manure (FYM) @ 25 ton/ha and 500 kg Neem cake/ha were applied by broad costing. 150 kg Nitrogen, 150 kg Phosphorus and 50 kg Potash were also applied in three split doses following standard package of practices were adopted uniformly for all genotypes. Observation were recorded on attributes like plant height (cm), number of leafs per plant, number of tillers per plant, leaf length (cm), leaf width (cm), number of rhizome per plant, length of rhizome per plant (cm) Width of rhizome per plant (cm), fresh weight of rhizome per plant (g), fresh weight of rhizome (q/ha), dry weight of rhizome (q/ha), curing percentage (%). The data collected were subjected to statistical analysis. For determination of stander error of mean (S.Em.±) and critical deference (C.D.) between the treatment means at 5% label of significance.

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## Result and discussion

The growth characters varied significantly in deferent cultivar with regard to plant height, number of leaves per plant, leaf length (cm), leaf width (cm). All these characters had significant positive correlation with yield. Among the genotypes, Roma, Suranjana, IISR Pratibha, IISR Alleppy Supreme, Rajendra Sonia and BSR-2, turmeric recorded better growth in respect of plant height, number of leaves per plant, number of tillers per plant, leaf length and leaf width. Plant height varied from 92.53 to 111.16 cm (Roma). Roma was at par with IISR Pratibha (106.56 cm). The highest number of leaves per plant was recorded in NDH – 18 (16.87) which were significantly superior with all other cultivars. The number of leaves per plant was least in Suroma (6.07), which was at par with Suranjana (7.97). Maximum number of tillers per plant was recorded in IISR Pratibha (3.88) and it was significantly superior with all other genotypes. Minimum values for number of tillers per plants were recorded in BSR-1 (1.92) and at par with Narendra haldi -18 (2.28).

The maximum leaf length was recorded in Roma (60.83 cm) and low leaf length was recorded in Narendra haldi -18. The maximum leaf width Roma (16.60 cm) which was significantly superior with all other cultivars. The leaf width was least in BSR-1 (5.83 cm) which was at par with Narendra haldi – 18. The maximum number of rhizome per plant was recorded in Roma (15.22 cm), which was significantly superior with all other genotypes evaluated. Low number of rhizome per plant was recorded in BSR – 2 (9.13 cm), which was at par with Narendra haldi -1 (10.07 cm) and IISR Allappy Supreme (10.07 cm). The maximum length of rhizome per plant was observed in Roma (9.12 cm) which was significantly superior with all other genotypes. Low length of rhizome per plant was observed in BSR-2 (4.55 cm) which was at par with BSR-1 (5.16 cm).

The maximum width of rhizome per plant was observed in Roma (3.18 cm) which was significantly superior with all the genotypes evaluated. Low width of rhizome per plant was recorded in BSR-2 (2.27 cm) Roma produced maximum fresh weight of rhizome per plant (484.80 g) which was

significantly superior with all other genotypes evaluated. Low fresh weight of rhizome per plant BSR-2 (297.78 g) at par with Narendra Haldi-1 (302.22 g).

The maximum fresh weight of rhizome was observed in Roma (306.95 q/ha) which was significantly superior with all other genotypes evaluated. Low fresh weight of rhizome was recorded in BSR-2 (240.65 q/ha), which was at par with Narendra Haldi -1 (245.28 q/ha). The variation in yield among the turmeric varieties grown under same agro-climatic conditions can be attributed to the genetic factors. The study indicated that the long duration genotypes Roma and Suroma produced higher dry weight of rhizome with high curing percentage. Roma exhibited highest productivity of dry weight of rhizome (64.90 q/ha) which was highly superior with all other cultivars evaluated under the trial, followed by Suroma (61.23 q/ha) and Suranjana (57.97 q/ha). The highest curing percentage found in Roma (24.74%) at par with Suroma (22.12%) and Suranjana (21.81%). The low curing percent was observed in BSR-2 (15.45%) at par with Narendra Haldi-1 (16.25%). The increase in dry matter production in long duration genotype might have increase curing percentage. The curing percentage depends on the genotype, duration, soil, nutrient management and agro-climacteric conditions, varied curing percentage in different genotypes in different agro-climatic conditions.

The higher yield in Roma could be attributed to maximum plant height, leaf length, leaf width, number of rhizome per plant, length of rhizome per plant, width of rhizome per plant and fresh weight of rhizome per plant, positive and significant association of rhizome yield with higher pseudo stem and curing percentage. The variation in growth and yield attributes among varieties grown under same agro- ecological condition can be attributed to the genetic factor. Based on the experimentation, it can be concluded that variety Roma was the most promising and suitable variety, which can be recommended in Uttar Pradesh region to enhance the production, productivity and economy of the tribal horticulture farmers.

**Table 1:** Growth and yield characters of turmeric varieties

Treatments	Plant Height (cm)	Number of leaves per plant	Number of tillers per plant	Leaf length (cm)	Leaf width (cm)	Number of Rhizome per plant	Length of Rhizome per plant (cm)	Width of Rhizome per plant (cm)	Fresh weight of Rhizome per plant (g)	Fresh weight of Rhizome (q/ha)	Dry weight of Rhizome (q/ha)	Curing percent (%)
NDH-1	74.17	14.99	3.10	42.15	10.47	10.07	6.33	2.27	302.22	245.28	45.67	16.25
NDH-18	74.50	16.87	2.28	19.58	7.23	11.15	6.45	2.32	305.77	260.23	44.70	17.52
BSR-1	76.40	9.96	1.92	20.55	5.83	10.03	5.16	2.47	361.23	255.57	48.02	18.20
BSR-2	92.53	11.18	3.13	51.65	13.95	9.13	4.55	2.07	297.78	240.65	40.98	15.45
Roma	111.16	9.40	3.29	60.83	16.60	15.22	9.12	3.18	484.80	306.95	64.90	24.74
Suroma	65.22	6.07	2.88	26.03	8.58	12.12	8.10	3.20	429.27	281.63	61.23	22.12
Suranjana	76.35	7.97	2.88	36.82	10.50	10.23	7.08	3.03	380.39	270.55	57.97	21.81
IISR Prathiba	106.20	9.33	3.88	55.33	13.45	11.53	6.20	2.58	345.17	263.86	45.52	19.11
IISR Alleppy Supreme	103.10	11.30	3.47	54.01	14.18	10.07	6.25	2.48	346.97	260.82	46.67	18.21
Rajendra Sonia	92.20	9.95	3.15	49.42	11.57	10.13	5.42	2.38	309.40	251.33	47.47	17.41
SEM ±	2.251	0.890	0.315	1.375	0.856	0.370	0.614	0.373	5.147	2.680	1.064	0.095
CD at 5%	6.826	2.699	0.956	4.170	2.607	1.123	1.861	1.131	15.611	8.130	3.227	0.288

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