

Effect of dates of planting, fertility levels and varieties on quality of turmeric

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SUMMARY

Planting dates of rhizomes at fortnight interval could not affect the moisture per cent of turmeric. Moisture per cent of turmeric increased with increasing fertility level from F_0 to F_3 . Cultivar NDH-1 (18) accumulated higher moisture per cent than cv. NDH-9 during 2006-07 and 2007-08. Planting of turmeric on 29th June accumulated maximum dry matter during both the year. Dry matter per cent decreased significantly with every increase in fertility level. Maximum dry matter per cent was recorded at zero fertility level. Cultivar NDH-1 (18) recorded less dry matter per cent than cv. NDH-9 during both the years. Planting of rhizomes at fortnight intervals had not marked effect on the curcumin per cent of turmeric. Curcumin per cent of turmeric increased with increasing fertility level from F_0 to F_3 . Minimum curcumin per cent were found with zero fertility level and maximum curcumin per cent was found at 200:100: 100 Kg NPK/ha fertility level NDH-1 (18) accumulated higher curcumin per cent than cv. NDH-9 during both the years. Dates of planting has not marked effect on oleoresin per cent of turmeric. Oleoresin per cent in turmeric increased with the increasing fertility level from F_0 to F_3 i.e. at 200: 100 : 100 Kg NPK/ha. Cultivar NDH-1 (18) accumulated less oleoresin per cent than cv NDH-9 and the differences were found to be significant during both the years.

Key words : Turmeric, Varieties, Dates of planting

Turmeric (*Curcuma longa* L.) is important spice crop of India. India is a largest producer and exporter of turmeric contributing about 82% of production and 45 per cent of export. For better yield and quality of turmeric, timely planting is essential. The optimum dates of planting of turmeric varies with varieties. The time of planting plays an important role on growth and yield. Turmeric is a season bound crop. Mishra *et al.* (1997) studied the effect of planting dates and varieties on yield of turmeric. May – June is recommended for its planting. During the period of growth, nitrogen, phosphorus and potassium are required in large quantities for better growth and yield. Under genus curcuma nearly 40 species have been recognized. *Curcuma longa* L. *Curcuma aromatica*, *Curcuma angustifolia*, *Curcuma amada*, *Curcuma zadoaria* and *Curcuma xanthorrhiza* are prominent species of turmeric.

Effect of suitable dates of planting and fertility levels on quality of turmeric varieties has been studied by various scientists. Studies on the quality of NDH-1 (18) and NDH-9 have not been made so far. Therefore, the quality of above varieties were studied in the present investigation.

MATERIALS AND METHODS

The experiments were laid out at Main Experiment

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Station, Vegetable Science N.D. University of Agriculture and Technology Faizabad in a leveled field with proper drainage. This farm is situated in the main campus of the university on the left side of Faizabad – Raibarelli road at a distance of 42 Km away from main city of Faizabad. The investigation was carried out during the successive Ziad/Kharif season of the year 2006-2007 and 2007-2008.

The experiment was framed in split plot design. Four dates of planting and fertility levels were used. Cultivars of turmeric NDH-1 (18) and NDH-9 were selected for study. Moisture per cent and dry matter per cent of rhizomes were recorded during both the years. Curcumin per cent and Oleoresin per cent of rhizomes were estimated by method described by Krishnamurthy *et al.* (1976).

RESULTS AND DISCUSSION

Data regarding the moisture per cent of turmeric rhizomes as influenced by dates of planting, fertility levels and varieties have been presented in Table 1. Data of Table 1 demonstrated that planting dates of rhizomes at fortnight intervals could not affect the moisture per cent of turmeric and differences in values on all the dates were found to be non significant during both the years of investigations.

A marked enhancement with regard to moisture per cent of turmeric was observed due to increasing fertility levels from F_0 to f_3 . Minimum moisture per cent i.e. 72.76 and 72.38 were obtained during 2006-07 and 2007-08, respectively with zero fertility level, however, the

Table 1 : Effect of dates of planting, fertility levels and varieties on quality of turmeric

| Treatments | Moisture % | | Dry matter (%) | | Curcumin (%) | | Oleoresin (%) | |
|---|------------|---------|----------------|---------|--------------|---------|---------------|---------|
| | 2006-07 | 2007-08 | 2006-07 | 2007-08 | 2006-07 | 2007-08 | 2006-07 | 2007-08 |
| Dates of planting | | | | | | | | |
| 15 th May (D ₁) | 78.06 | 77.66 | 21.94 | 22.34 | 4.94 | 5.0 | 10.35 | 10.71 |
| 30 th May (D ₂) | 77.31 | 76.90 | 22.69 | 23.10 | 4.90 | 4.95 | 10.25 | 10.61 |
| 14 th June (D ₃) | 74.26 | 73.88 | 25.74 | 26.13 | 4.70 | 4.75 | 9.85 | 10.19 |
| 29 th June (D ₄) | 73.51 | 73.12 | 26.49 | 26.88 | 4.66 | 4.70 | 9.75 | 10.09 |
| S.E.± | 1.13 | 1.12 | 0.36 | 0.37 | 0.07 | 0.07 | 0.15 | 0.16 |
| C.D. (P=0.05) | 2.88 | 2.86 | 0.92 | 0.93 | 0.18 | 0.18 | 0.38 | 0.39 |
| Fertility levels (NPK Kg/ha) | | | | | | | | |
| 0:0:0 (F ₀) | 72.76 | 72.38 | 27.24 | 27.63 | 4.61 | 4.66 | 9.65 | 9.98 |
| 120:60:60 (F ₁) | 75.79 | 75.38 | 24.21 | 24.62 | 4.80 | 4.85 | 10.05 | 10.40 |
| 160:80:80 (F ₂) | 76.54 | 76.15 | 23.46 | 23.85 | 4.85 | 4.90 | 10.15 | 10.50 |
| 200:100:100 (F ₃) | 78.06 | 77.64 | 21.94 | 22.36 | 4.94 | 5.0 | 10.35 | 10.71 |
| S.E.± | 0.99 | 0.98 | 0.30 | 0.31 | 0.06 | 0.06 | 0.13 | 0.14 |
| C.D. (P=0.05) | 2.12 | 2.11 | 0.65 | 0.66 | 0.13 | 0.14 | 0.28 | 0.29 |
| Varieties | | | | | | | | |
| NDH-1 (18) (V ₁) | 76.54 | 76.14 | 23.46 | 23.86 | 4.85 | 4.90 | 9.95 | 10.30 |
| NDH-9 (V ₂) | 75.03 | 74.64 | 24.97 | 25.37 | 4.75 | 4.80 | 10.15 | 10.50 |
| S.E.± | 0.68 | 0.67 | 0.23 | 0.24 | 0.04 | 0.04 | 0.09 | 0.09 |
| C.D. (P=0.05) | 1.43 | 1.42 | 0.49 | 0.50 | 0.09 | 0.09 | 0.19 | 0.20 |

maximum moisture per cent 78.06 and 77.64 were obtained during 2006-07 and 2007-08, respectively with 200 : 100 : 100 kg NPK/ha fertility level. Fertility levels on moisture content were found to be non-significant during both the years of experimentation.

Cultivar NDH-1 (18) accumulated higher moisture per cent than cv. NDH-9 and differences were found to be significant during both the years.

Observations recorded on dry matter per cent as the result of dates of planting, fertility levels and varieties have been presented in Table 1.

It is apparent from Table 1 that planting of turmeric at four different dates *i.e.* 15th May, 30th May, 14th June and 29th June did not show the level of significance in connection with dry matter per cent during both the years of investigation.

A perusal of data manifested in Table 1 showed that dry matter per cent have been decreased significantly with every increase in fertility level during both the years of study. Maximum dry matter per cent *i.e.* 27.24 and 27.63 were found during 2006-07 and 2007-08, respectively with zero fertility level. Cultivar NDH-1 (18) recorded less dry matter per cent than cv NDH-9 during both the years.

Observations recorded on curcumin per cent as the result of dates of planting, fertility levels and varieties have been presented in Table 1.

It is apparent from table that planting of rhizomes at

fortnight intervals could not affect the curcumin per cent of turmeric and differences in values of all the dates were found to be non significant during both the years. A marked enhancement with regard to curcumin per cent of turmeric was observed due to increasing fertility levels from F₀ to F₃. Minimum curcumin per cent *i.e.* 4.61 and 4.66 were found during 2006-07 and 2007-08, respectively with zero fertility level, however, the maximum curcumin per cent 4.94 and 5.00 were obtained during 2006-07 and 2007-08, respectively with 200:100:100 Kg NPK/ ha fertility level but the differences were found to be non significant. Cultivar NDH-1 (18) accumulated higher curcumin per cent than cv. NDH-9 and the differences were found to be significant during both the years. Curcumin content in 11 turmeric germplasm has been studied by Datta and Chatterjee(2001). Sasi Kumar *et al.* (2005) worked out curcumin in 'IISR Kedaram' and 'IISR Alleppey supreme' varieties of turmeric.

The data regarding the oleoresin per cent of turmeric rhizomes as influenced by dates of planting, fertility levels and varieties have been presented in Table 1. It is apparent from the table that planting of turmeric at four different dates *i.e.* 15th May, 30th May 14th June and 29th June did not touch the level of significance in connection with oleoresin per cent during both the years. A perusal of data manifested in Table 1 showed that oleoresin per cent of turmeric increased with increasing fertility level from F₀ to F₃. Minimum oleoresin per cent *i.e.* 9.65 and 9.98

were obtained during 2006-2007 and 2007-08, respectively with zero fertility level. Maximum oleoresin per cent 10.35 and 10.71 were obtained during 2006-07 and 2007-08, respectively with 200:100:100 Kg NPK/ha fertility levels. Differences were found to be non significant during both the years.

Cultivar NDH-1 (18) accumulated less oleoresin per cent than the cv. NDH-9 and the differences were found to be significant during both the years. Oil and oleoresin content in turmeric cultivars were also studied by Krishnamurthy *et al.* (1976).

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