

## Effect of different sources of nitrogen on growth and yield of cabbage (*Brassica oleracea* L. var. *Capitata*)

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### ABSTRACT

An experiment was conducted to study the effect of different sources of nitrogen on growth and yield of cabbage at Central Nursery, Department of Horticulture, Marathwada Agricultural University, Parbhani during 2008-09. The treatment T<sub>4</sub> (50% RDF + 50% N through sheep manure) was found to be superior over remaining treatment. Treatment T<sub>4</sub> was found to produce highest number of leaves (18.13), maximum plant spread (53.53 cm), maximum circumference of stem (8.30 cm), highest mean leaf area (7073.70 cm<sup>2</sup>), highest mean fresh weight of plant (620 g) and mean dry weight of plant (61.33 g), maximum weight of head (829 g) and highest yield per plot (15.46 kg) followed by T<sub>5</sub> (25% RDF + 75 % N through sheep manure). Treatment T<sub>2</sub> (50% RDF + 50% N through FYM) recorded significantly earlier head initiation (31.73 days), while treatment T<sub>3</sub> (25% RDF + 75% N through FYM) recorded earlier maturity of head (66.26 days), followed by T<sub>2</sub> (68.03 days). Lowest performance was observed in treatment T<sub>1</sub> (control) 100% RDF.

**Key words :** Different sources of nitrogen, Growth, Yield and cabbage

In India, cabbage is grown on large scale. Cabbage is commonly used fresh as salad, boiled vegetable, cooked in curries and processed as well as dehydrated. It is known to possess medicinal properties.

The use of manures and fertilizers is one of the essential requirement to increase the yield. Nitrogen is key element influencing growth and productivity of vegetables. Vegetable crops needs nitrogen in large quantity as it constitute 40-50 per cent dry matter. The demand of nitrogen is high when growth is in rapid stage. It is well documented that N deficiency restricts the yield and quality of the produce. Excessive N application result in luxuriant vegetative growth, delay in maturity, poor quality of produce and accumulation of potentially hazardous concentration nitrates. Use of organic sources of nitrogen for vegetable production has become popular in recent years. Judicious use of organic manure and inorganic fertilizer is of crucial importance for getting higher yield of better quality.

Excessive use of chemical fertilizers is creating several problem of soil and human health. It is urgent need of day to replace or to optimize dose of inorganic fertilizers through organic manures in order to maintain the soil health, its productivity and quality.

The time has come to respond to the need and focus upon the benefits of organic supplements is vegetable cultivation.

With this view point, the present investigation "Effect of different sources of nitrogen on growth and yield of cabbage was undertaken"

### MATERIALS AND METHODS

The present investigation entitled "Effect of different sources of nitrogen on growth and yield of cabbage" was conducted at Central Nursery, Department of Horticulture, Marathwada Agricultural University, Parbhani. A field experiment was laid out during 2008-09 in Randomized Block Design (RBD) with seven treatments *viz.*,

Sr. No.	Treatment No.	Treatment details
1.	T <sub>1</sub>	100% RDF (control)
2.	T <sub>2</sub>	50% RDF + 50% N through FYM
3.	T <sub>3</sub>	25% RDF + 75% N through FYM
4.	T <sub>4</sub>	50% RDF + 50% N through sheep manure
5.	T <sub>5</sub>	25% RDF + 75% N through sheep manure
6.	T <sub>6</sub>	50% RDF + 50% N through vermicompost
7.	T <sub>7</sub>	25% RDF + 75 % N through vermicompost

Half dose of N and full of P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O were applied during transplanting and remaining half dose of N was applied 30 days after transplanting. The observations on various character were recorded and subjected to statistical analysis.

### RESULTS AND DISCUSSION

Analysis of variance was carried out for all characters as indicated in Table 1 revealed significant differences among all the treatments.

**Table 1 : Effect of different sources of nitrogen on growth and yield of cabbage**

Treatment no.	Minimum number of leaves per plant	Mean spread of the plant (cm)	Circumference of stem (cm)	Mean leaf area (cm <sup>2</sup> )	Mean fresh weight of plant (g)	Mean dry weight of plant (g)	Mean number of days required for head initiation (days)	Mean number of days required for Head maturity	Mean weight of head (g)	Head yield per plot (kg)
T <sub>1</sub>	15.56	47.76	6.96	6384.70	440.00	43.33	40.73	69.30	644.67	9.88
T <sub>2</sub>	16.63	49.60	7.46	6565.70	481.67	48.83	31.73	68.03	681.67	10.88
T <sub>3</sub>	16.20	49.13	7.20	6528.00	476.67	47.93	32.20	66.26	665.00	11.30
T <sub>4</sub>	18.13	53.53	8.30	7073.70	620.00	61.33	33.16	70.26	829.00	15.46
T <sub>5</sub>	18.00	52.36	7.93	7007.00	570.00	56.33	33.86	68.73	803.00	15.03
T <sub>6</sub>	17.70	51.63	7.46	6934.30	560.00	55.36	34.93	70.16	750.00	13.50
T <sub>7</sub>	17.60	51.46	7.06	6831.00	488.33	48.43	36.30	69.63	731.67	13.17
S.E. ±	0.44	0.46	0.24	88.87	28.17	2.98	0.58	0.67	22.40	0.48
C.D. (P=0.05)	1.35	1.43	0.73	273.45	86.69	9.19	1.78	2.08	68.93	1.47

### Number of leaves:

Treatment T<sub>4</sub> recorded more number of leaves per plant (18.13) which was statistically at par with treatment T<sub>5</sub> (18.00). However, treatments T<sub>6</sub>, T<sub>7</sub> and T<sub>2</sub> and T<sub>3</sub> were found to be statistically at par with each other. Significantly lowest number of leaves per plant (15.56) were recorded in treatment T<sub>1</sub> (control). The results are supported by Yadav *et al.* (2002) and Gadge (2003) in cabbage.

### Plant spread (cm):

Highest plant spread was recorded in treatment T<sub>4</sub> (53.53 cm), which was statistically at par with treatment T<sub>5</sub> (52.36 cm). Significantly least spread of plant was recorded in treatment T<sub>1</sub> (47.76 cm). Results are in similar to those reported by Yadav *et al.* (2002) in cabbage.

### Circumference of stem (cm):

Maximum circumference of stem was recorded in treatment T<sub>4</sub> (8.30 cm) which was statistically at par with T<sub>5</sub> (7.93 cm) and significantly superior over remaining treatments under study. Lowest circumference of stem was recorded in treatment T<sub>1</sub> (6.96 cm). The results are in similar lines with Bindu (1994) in cabbage.

### Leaf area (cm<sup>2</sup>):

Significantly highest leaf area per plant (7073.70 cm<sup>2</sup>) was recorded in treatment T<sub>4</sub>, which was statistically at par with treatment T<sub>5</sub> (7007.00 cm<sup>2</sup>), T<sub>6</sub> (6934.30 cm<sup>2</sup>) and T<sub>7</sub> (6831 cm<sup>2</sup>) and significantly superior over remaining treatments. Significantly lowest area (6384.70 cm<sup>2</sup>) was recorded in treatment T<sub>1</sub>. Similar results were obtained by Yadav *et al.* (2002) and Chitrakar (2004) on cabbage.

### Fresh and dry weight of plant (g):

Treatment T<sub>4</sub> recorded significantly maximum fresh weight of plant (620 g), which was statistically at par with treatment T<sub>5</sub> (570 g) and T<sub>6</sub> (560 g) and significantly superior over remaining treatments. Lowest fresh weight of plant was recorded in treatment T<sub>1</sub> (440 g).

Similar trend was observed in dry weight of the plant, significantly highest dry weight was recorded in treatment T<sub>4</sub> (61.33 g) which was statistically at par with treatments T<sub>5</sub> (56.33 g) and T<sub>6</sub> (55.36 g), which was superior over rest of treatments. Lowest dry weight of plant was recorded in treatment T<sub>1</sub> (43.33 g). The results are in conformity with Chitrakar (2004) on cabbage.

### Head initiation (days):

The treatment T<sub>2</sub> recorded significantly earlier head initiation (31.73 days), which was statistically at par with

treatment T<sub>3</sub> (32.30 days) and T<sub>4</sub> (33.16 days), but was significantly superior over rest of treatments. Significantly maximum number of days for head initiation (70.73 days) were recorded in T<sub>1</sub> (control). The results are in conformity with finding of research workers Gadage (2003) in cabbage.

#### Head maturity (days):

Treatment T<sub>3</sub> recorded earlier maturity (66.26 days) which was at par with treatment T<sub>2</sub> (68.03 days), which were significantly superior over remaining treatments under study. Significantly more number of days were required for head maturity in treatment T<sub>4</sub> (70.26 days). The results are similar lines with Gurav (2002) and Chitrakar (2004) in cabbage.

#### Weight of head:

The treatment T<sub>4</sub> recorded maximum head weight (829 g), which was statistically and significantly superior over remaining treatments under study. Lowest head weight was recorded in treatment T<sub>1</sub> control (644.67 g).

#### Yield per plot (kg):

Highest yield per plot was recorded in treatment T<sub>4</sub> (15.46 kg) which was statistically at par with treatment T<sub>5</sub> (15.03 kg) and significantly superior over remaining treatments under study. Significantly lowest yield per plot was recorded in treatment T<sub>1</sub> (control) *i.e.* 9.88 kg. The results are in lines with Alok (2001) and Londhe (2002) in cabbage.

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