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Performance of Round Gourd var. Arka Tinda Affected by INM Strategies

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Abstract
A field experiment was conducted at Research Farm, Mewar University, Chittorgarh (Rajasthan) during *Summer*, 2025 on loamy sand soil, which consisted nine treatments *viz*., T_0: Control, T_1: FYM @ 18 ton/ ha, T_2: FYM @ 9 ton + NPK 40:20:20 kg/ha (25% RDF), T_3: Vermicompost @ 4 ton/ha, T_4: Vermicompost @ 2 ton + NPK 40:20:20 kg/ha (25% RDF) T_5: Poultry manure @ 3 ton/ha, T_6: Poultry manure @ NPK 40:20:20 kg/ha (25% RDF), T_7: Neem cake 0.4 ton/ ha, T_8: Neem cake 0.2 ton + NPK 40:20:20 kg/ha (25% RDF) Randomized Block Design (RBD). The round gourd variety "Arka Tinda" was used for experiment.
Results clearly showed that growth attributes *viz*., vine length (cm), appearance of 1st female flowers and whereas yield attributes and yields *viz*., maximum yield parameters *viz*. fruit weight, number of fruits/plant and total yield significantly higher recorded under T_6: Poultry manure @ 1.5 ton + NPK 40:20:20 kg/ha (25% RDF) over control and remained at par with, T_4: Vermicompost @ 2 ton + NPK 40:20:20 kg/ha (25% RDF).

Keywords: Round gourd, FYM, RDF, Vine Length and Growth and Yield chracters

Introduction
Cucurbitaceae family is a largest group of vegetables crops which provide the major contribution for economically important domesticated species and are cultivated form medicinal and nutritional value. Round gourd belongs to the genus *Lagenaria* that is derived from the word *lagena*, meaning 'the round'. It seems that round gourd was originated from India because its wild races are found in Dehradoon (high humid area and Malabar coastal area). Roundgourd (*Praecitrullus fistulosus*) is one of the most popular cucurbitaceous crops grown in India and entire world.
The round gourd is highly variable range in the male to female sex ratio. The production of staminate flower is normally much more than pistillate flowers. However, ultimately only pistillate flowers contribute to the yield in the crop. So, it is highly important to achieve a shift in favour of pistillate flowers in round gourd crop (Behera *et al*., 2010) [2]. Consumption of round gourd has been associated with a number of functional properties and health benefits: anti-hyper-lipidemic activity, analgesic and anti- inflammatory activity, diuretic activity, anti-oxidant activity, immuno-modulatory activity, hepato-protective activity, cardio- protective activity, anti-diabetic activity, central nervous system activity, hypertensive activity, anticancer activity, CNS depressant activity (Sharma *et al*., 2012) [8].
Nutrient management plays an important role in boosting up the yield of vegetable crops. Integrated use of organic manure, inorganic fertilizers and biofertilizers, as a source of plant nutrients helps in building up soil health and productivity of crops. It helps in improving soil physical and biological properties. It supplies the various nutrients required by the plant in a balanced form and avoids ill effects on soil health, those associated with the use of inorganic fertilizers. Thus, this system supplies all the nutrients judiciously to increase yield in a sustainable way. Hence, the integrated approach of plant nutrient supply is indespensible for sustaining the production potential of vegetable crops (Ramesh *et al*., 2009) [5].
Farmyard manure (FYM) is the traditional organic manure and is most readily available to the farmers.

The value of FYM in soil improvement is also due to its content of micro nutrients and its ability to improve soil health and aeration, as well as water holding capacity of soil and to stimulate the activity of microorganisms, which in turn will greatly help the availability of nutrient elements to crop plants.

Fertilizers have played a major role in increasing crop productivity. Over use of these chemical fertilizer causes the problem of environmental pollution and deterioration of soil structure and also there is problem of loss of applied fertilizers through leaching, volatilization and denitrification of nitrogen and fixation of phosphorous. Besides their prices increases day by day. The continuous and indiscriminate use of inorganic fertilizers lead to decrease the nutrient uptake and adversely affect the quality of vegetables (Agrawal *et al.* 2003) [1].

Materials and methods

The field experiments were carried out during *summer* season (2025) to study the "Performance of Round Gourd var. Arka Tinda Affected by INM Strategies" in randomized block design (RBD) with consisted nine treatments *viz*., T_0: Control, T_1: FYM @ 18 ton/ ha, T_2: FYM @ 9 ton + NPK 40:20:20 kg/ha (25% RDF), T_3: Vermicompost @ 4 ton/ha, T_4: Vermicompost @ 2 ton + NPK 40:20:20 kg/ha (25% RDF) T_5: Poultry manure @ 3 ton/ha, T_6: Poultry manure @ NPK 40:20:20 kg/ha (25% RDF), T_7: Neem cake 0.4 ton/ ha, T_8: Neem cake 0.2 ton + NPK 40:20:20 kg/ha (25% RDF) at Research Farm, Mewar University, Chittorgarh (Rajasthan). The experimental farm is geographically located at 075º88'99" E longitude and 26º81'17" N latitude and this region falls under agro-climatic zone IV A of Rajasthan. The experimental fields were clay loam and the soil fertility status contained available nitrogen (137.8 kg ha^{-1}) by Subbiah and Asija 1996, available phosphorus (16.3 kg ha^{-1}) by Olsen *et al*. 1954 and available potassium (250.12 kg ha^{-1}). The organic carbon content was from 0.34-0.38 per cent. The weekly mean maximum and minimum temperatures were of temperature during both summers (40.6° C) and winters (2.7° C). The mean relative humidity fluctuated from 63.50 to 91 per cent during the crop season. The average rainfall is 557 mm per annum, which is mostly received during july to September. The sporadic showers during winters are also common, which are probably observed during this period. The observation were recorded at harvest was analysed by statistical methods.

Table 1: Studies on nutrient management on growth attributes of round gourd

Treatment	Vine length (cm)	Appearance of 1st female flower (days)
T_0	137.54	59.79
T_1	175.78	52.91
T_2	203.48	52.78
T_3	209.58	48.71
T_4	280.51	39.83
T_5	239.31	48.45
T_6	283.43	35.95
T_7	150.24	57.98
T_8	248.15	44.98
SEm±	8.03	1.06
CD (P=0.05)	24.08	3.20
CV (%)	6.83	6.78

Table 2: Studies on nutrient management on yield attributes and yields of round gourd

Treatment	Fruit weight (g)	Number of fruits/plant	Yield (q/ha)
T_0	70.58	9.59	85.37
T_1	83.15	12.38	90.19
T_2	90.28	13.75	93.17
T_3	91.53	14.03	93.93
T_4	106.75	17.66	99.22
T_5	98.83	15.57	96.23
T_6	107.95	18.08	99.51
T_7	77.07	11.03	87.96
T_8	99.64	15.96	96.37
SEm±	2.06	0.42	0.68
CD (P=0.05)	6.20	1.28	2.07
CV (%)	6.48	4.88	7.35

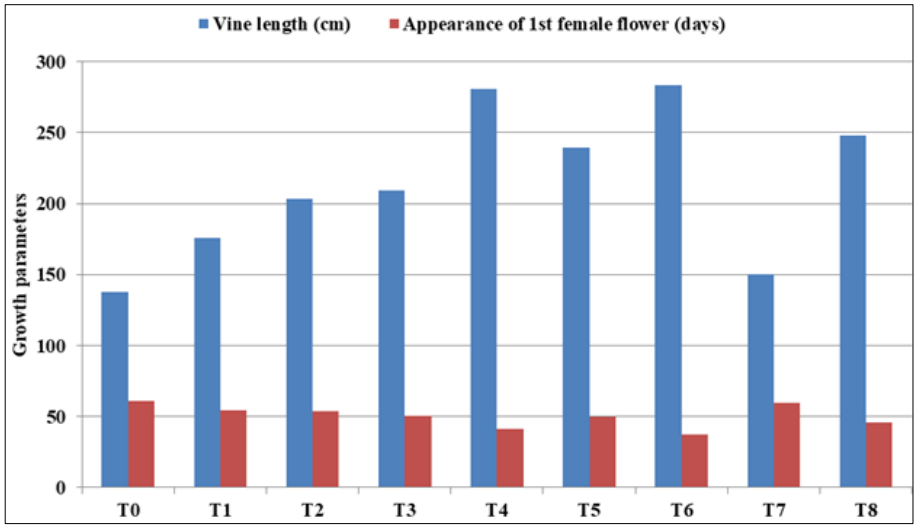

Fig 1: Studies on nutrient management on growth attributes of Round gourd

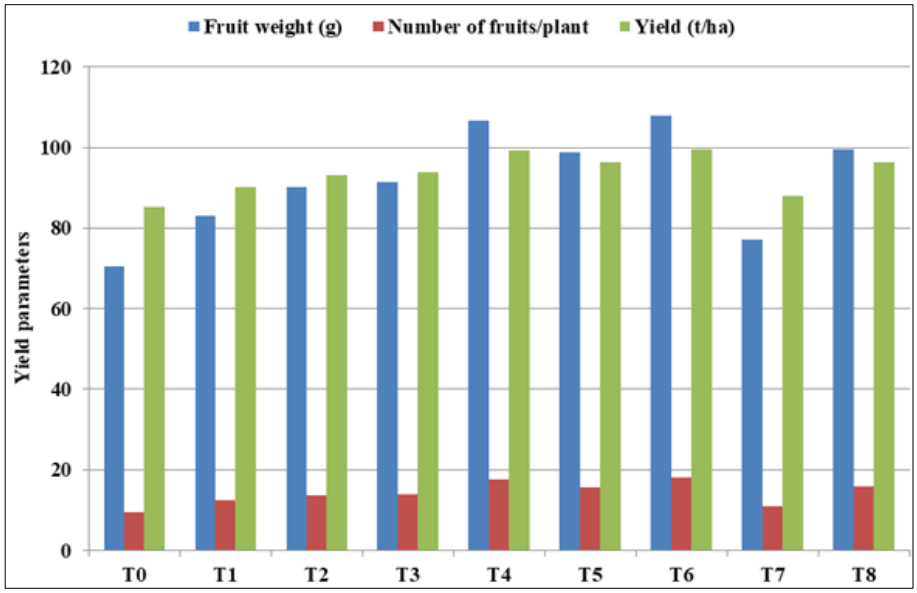

Fig 2: Studies on nutrient management on yield attributes and yields of Round gourd

Result and Discussion

It is clear from the result of present study that, nutrient management had significantly affected the growth and yield parameters of round gourd. Application of T_6: Poultry manure @ 1.5 ton + NPK 20:14:20 kg/ha (50% RDF) recorded the highest growth attributes *viz*. vine length (283.43 cm) at harvest and 1st appearance of female flowers (35.75) which was remained statistically at par with T_4: Vermicompost @ 2 ton + NPK 20:14:20 kg/ ha (50% RDF) (Table-1). Vine length and 1st appearance of female flowers increased with the application of organic and inorganic sources of nutrients due to increased cell division and cell elongation at higher level of nutrients. Probably the increase in auxin supply with higher levels of nitrogen brought about increase in the dry matter and branches per plant.

The observed improvement might be due to an early and plentiful availability of nutrients leading to better nutritional environment in the root zone for growth and development. As nitrogen is one of the major essential plant nutrients required for growth (Budige *et al*., 2021 and Somvanshi *et al.,* 2024) [3]. It is obvious that phosphorus and potassium has long been considered as an essential constituent of all living organism, which plays an important role in conservation and transfer of energy in metabolic reactions of living cells including biological energy transformations.

Further yield attributes and yields like fruit weight (107.95 g), number of fruits/plant (18.08) and yield (99.51 q/ha) presented in table 2, recorded with the application of T_6: Poultry manure @ 1.5 ton + NPK 20:14:20 kg/ha (50% RDF) over control but it was remained statistically at par with T_4: Vermicompost @ 2 ton + NPK 20:14:20 kg/ ha (50% RDF). Yield components by enhancing cell division, cell elongation process and photosynthetic activity leading to production and accumulation of more carbohydrates and auxins which favours retention of more flowers ultimately leading to more number of reproductive parts plant^{-1} (Sinha *et al*., 2023 and Thakur *et al*. 2024.) [10, 13].

Conclusion

Based on the results of one year experimentation, it may be concluded that the Application of T_6: Poultry manure @ 1.5 ton + NPK 20:14:20 kg/ha (50% RDF) found suitable to produce good yield of round gourd.

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