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Integrated nutrient management in lentil

Ganajaxi Math, Gurupad Balol and Lalita Jaggal**Abstract**

The experiment was conducted at Main Agricultural Research Station (MARS), University of Agricultural Sciences, Dharwad during the winter season of 2015 under rainfed condition. Treatments comprised of two organic levels viz., with vermicompost (2t/ha) and without vermicompost, two levels of fertilizers (25:50:0 and 37.5:75:0 kg of N: P₂O₅: K₂O/ha) and two foliar sprays (with and without 2% DAP spray at flowering stage). Among different INM practices, application of 37.5:75:0 kg of N: P₂O₅: K₂O/ha with 2 t/ha vermicompost and spraying of 2% DAP at flowering stage recorded significantly higher yield over other treatments.

Keywords: Lentil, integrated nutrient management and vermicompost**Introduction**

Lentil (*Lens culinaris* Medikus subsp. *Culinaris*) is one of the important pulse crop grown in India. Importance of lentil as a pulse crop is well documented since times immemorial due to its role in food, feed and farming systems of India. Its inclusion in daily diet as dal (a popular concentrated soup) with rice provides a complete food for human nutrition. Its seeds contain high quantity and quality protein along with essential minerals and vitamins; high lysine content in its seed complements the low lysine in cereal proteins. Its less cooking time compared to other pulses made lentil more popular in the fuel-deficient developing countries like India. India has got 1.48 m ha area with production of 1.03 m t and productivity of 697 kg/ha with respect to lentil. In Karnataka it is grown in Belgaum district and drill sown paddy fallows of Zone 8 and 9. Even though it is being grown by farmers since several years, there is no improved variety, recommended spacing and fertilizer dose to achieve higher yield in this crop. Among several management options, nutrient management is of great importance to realize higher yield. Hence this study was conducted with the objective to find out optimum nutrient management for higher yield in lentil.

Material and methods

The experiment was conducted at Main Agricultural Research Station (MARS), University of Agricultural Sciences, Dharwad during the winter season of 2015 under rainfed condition with two protective irrigations. The geographical co-ordinates of Dharwad are 15°26' N latitude and 75°7' E longitude and an altitude of 678 m above mean sea level. It is located in the Northern Transition Zone of Karnataka which has semi arid climate. The soil of the experimental site was clayey in nature and having available N, P and K of 211, 18.5 and 320.8 kg/ha, respectively. Organic carbon (%) and pH of the soil were, respectively 0.52% and 7.2. Treatments comprised of two organic levels viz., with vermicompost (2t/ha) and without vermicompost, two levels of fertilizers (25:50:0 and 37.5:75:0 kg of N: P₂O₅: K₂O/ha) and two foliar sprays (with and without 2% DAP spray at flowering stage). Genotype Belgaum local was sown on 15th, October 2015.

Results and Discussion

Among different Integrated nutrient management practices, T2 which was applied with higher dose of fertilizer viz., 37.5:75 kg of N: P₂O₅/ha with 2 t/ha vermicompost and sprayed with 2% DAP at flowering stage recorded significantly higher yield (705 kg/ha) over other treatments (534-605kg/ha) Similar type of findings were also reported by Dixit and Elamathi, 2007 [2], Bhowmick, 2008 [3] and Dubey *et al.*, 2014 [1]. This treatment recorded higher number of pods/plant (47.67) and higher 100 seed weight (3.92) compared to others. The higher yield obtained in T2 was due to improved physical, chemical and biological properties of soil due to

application of organic manure (Vermicompost@ 2t/ha) and higher dose of chemical fertilizer (37.5:75 kg of N: P₂O₅/ha). Apart from this flower dropping was reduced and number of pods/plant and test weight were increased due to spraying of 2% DAP. Since pulses are facing scarcity of nutrients at flower initiation and pod initiation due to their indeterminate habit, which allocates photosynthates to vegetative parts, flowers/buds and nodules simultaneously. Due to this there will be shortage of photosynthates to the developing buds, which leads to dropping of flowers. The spraying of 2% DAP supplies nutrients quickly (within 24hours) through foliage and buds and helps the flower to retain and develop into pod and accumulates more food in seed and resulted into more number of pods/plant and higher test weight (100 seed weight)



Vermi compost @ 2t/ha +37.5:75.0kg N:P:K/ha With 2% DAP



No vermi compost + 25.5.0 kg N:P:K Without 2% DAP

Table 1: Yield and yield parameters of Lentil as influenced by Integrated Nutrient Management

Treatments	Seed yield (kg/ha)	Pods/plant	Primary branches/Plant	100 seed weight(g)
Vermicompost@ 2t/ha + 25:50 N:P ₂ O ₅ kg /ha with 2%DAP spray	625	39.89	2.89	3.74
Vermicompost @ 2t/ha + 37.5:75 N:P ₂ O ₅ kg /ha with 2%DAP spray	705	47.67	3.22	3.92
Vermicompost @ 2t/ha + 25:50 kg N:P ₂ O ₅ kg /ha without 2%DAP spray	534	36.88	2.44	3.62
Vermicompost @ 2t/ha + 37.5:75 kg N:P ₂ O ₅ kg /ha without 2%DAP spray	584	40.00	2.44	3.67
No Vermicompost + 25:50 kg N:P ₂ O ₅ kg /ha with 2%DAP spray	573	38.67	2.44	3.57
No Vermicompost + 37.5:75:0 kg N:P ₂ O ₅ kg /ha with 2%DAP spray	605	42.22	2.78	3.64
No Vermicompost + 25:50 kg N:P ₂ O ₅ kg /ha without 2% DAP spray	544	37.22	2.38	3.38
NoVermicompost + 37.5:75:0 kg N:P ₂ O ₅ kg /ha without 2%DAP spray	599	44.33	2.75	3.47
SEM	23	1.18	0.12	0.14
CD @ 5%	69	3.54	0.36	0.42

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