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Effect of integrated nutrient management on growth and yield of Indian bean (*Dolichos lablab* L.) cv. Gujarat papadi 1

Priyankaben B Goswami, Sitapara HH and Mecwan SJ

Abstract
An experiment was conducted at Horticultural Research Farm, Department of Horticulture, BA College of Agriculture, Anand Agricultural University, Anand with a view to study the effect of integrated nutrient management on growth and yield of Indian bean (*Dolichos lablab* L.) cv. Gujarat papadi 1 during the year 2021-22. The experiment was arranged in Randomized Block Design with three replications having ten treatments. The results revealed that significantly maximum plant height 164.21, 179.03 and 196.17 cm at 50, 70 and 90 DAS, respectively, maximum number of branches 5.07, 8.00 and 9.79 at 50, 70 and 90 DAS, respectively, The maximum leaf area 197.05, 224.05 and 231.38 cm² and leaf area index 0.050, 0.055 and 0.057 at 50, 70 and 90 DAS, respectively was recorded with the application of 60% RDN through chemi. Ferti. + 40% N through castor cake + soil application of *jivamrut* @ 500 l/ha. The yield attributes *viz*. number of pods/plant (244.06), pod length (5.95 and 6.09 cm at third and fifth picking, respectively), pod width (1.57 and 1.50 cm at third and fifth picking, respectively), average ten green pod weight at third and fifth picking (28.69 and 29.95gm, respectively) and pod yield (9.36 kg/plot & 9.63 t/ha) were recorded higher with the treatment 60% RDN through chemi. Ferti. + 40% N through castor cake + soil application of *jivamrut* @ 500 l/ha.

Keywords: Integrated nutrient management, growth, yield, Indian bean, jivamrut and castor cake

Introduction
Indian bean is a bushy semi erect herb and it belongs to family fabaceae. It is locally known as 'Papadi'. It is a drought tolerant crop and it is an excellent crop to be grown in dry lands with limited rainfall. Indian bean thrives best in loamy, silty loam and clay loam soils. It is necessary to have well drainage of soil. Soil of pH range 5.5-6.0 with cool climatic condition is suited for beans farming. It is a multipurpose crop grown as pulse, vegetable and forage. Its green pods and seeds are highly nutritive in nature (Thamburaj and Singh, 2003) [1]. The integrated nutrient management system approach utilizes a judicious combination of inorganic fertilizer and organic wastes in building soil fertility and to increase the production potential of crop. In general, the major objective of INM is to integrate the use of all natural and manmade sources of plant nutrients, so that crop productivity increases in an efficient and eco-friendly manner, without sacrificing soil productivity of future generations. Chemical fertilizers like nitrogen and phosphorous play an important role in physiology of plant. Nitrogen plays an important role in growth and development of Indian bean. Nitrogen application in legumes is not commonly practiced in India but it has been proven that nitrogen application is beneficial in beans. Importance of organic manures in vegetable production is an established fact. Organic manures release nutrients on decomposition. Organic manures contain small percentage of nutrients and are applied in large quantities. Vermicompost provides vital macronutrient (N, P, K, Ca and Mg) and micronutrient (Fe, Mo, Zn and Cu). It is simple manure which acts progressively that encourages soil microbial activity. It can be used in any type of soil and have a high content of organic matter. Bio-fertilizers also helps in stimulating plant growth and development, maintaining soil reaction, improving physical as well as biological properties of soil and thereby making nutrients easily available to the plants.

Materials and Methods
Present investigation on "Effect of integrated nutrient management on growth and yield of Indian bean (*Dolichos lablab* L.) cv. Gujarat papadi 1" was carried out during *Rabi* season of the year 2021-22 at Horticultural Research Farm, Department of Horticulture.

BA College of Agriculture, AAU, Anand. The Anand is located in middle Gujarat where agro-climatic region semi-arid and sub-tropical type. Winter is mild, cool and dry while summer is quite hot and dry. The soil of the field where experiment carried out is sandy loam and is locally known as "*Goradu*".

The experiment was conducted in Randomized Block Design with three replications, including ten treatments (Table 1).

Table 1: Treatment Combinations of the experiment

Treatment No	Treatment details
T_1	RDF (20:40:00 NPK kg/ha)
T_2	75% RDN through chemi. Ferti. + 25% N through FYM
T_3	75% RDN through chemi. Ferti. + 25% N through vermicompost
T_4	75% RDN through chemi. Ferti. + 25% N through castor cake
T_5	75% RDN through chemi. Ferti. + 25% N through FYM + soil application of *jivamrut* @ 500 l/ha
T_6	75% RDN through chemi. Ferti. + 25% N through vermicompost + soil application of *jivamrut* @ 500 l/ha
T_7	75% RDN through chemi. Ferti. + 25% N through castor cake + soil application of *jivamrut* @ 500 l/ha
T_8	60% RDN through chemi. Ferti. + 40% N through FYM + soil application of *jivamrut* @ 500 l/ha
T_9	60% RDN through chemi. Ferti. + 40% N through vermicompost + soil application of *jivamrut* @ 500 l/ha
T_{10}	60% RDN through chemi. Ferti. + 40% N through castor cake+ soil application of *jivamrut* @ 500 l/ha

The data were recorded on plant height (cm), no. of branches per plant, leaf area (cm^2) and leaf area index [Leaf area (cm^2)/ Land area (cm^2)] at 50, 70 and 90 days after sowing. No. of pods per plant, length of pod(cm), width of pod (cm) and ten green pod weight(g) at third and fifth picking. The marketable green pod from the each net plot were harvested separately and weighed separately for green pod yield (kg $plot^{-1}$ & t ha^{-1}). Harvest index (%) reflects the proportion of assimilate distribution between economic yield and total biomass yield.

The data recorded from the various observations were tabulated and then subjected to their statistical analysis by using the method of analysis of variance (ANOVA) as described by Panse and Sukhatme (1967) [2] and where the F-values were significant (P=0.05) the means were separated by Duncan's multiple range test (Duncan, 1955) [3].

Result and Discussion

Growth parameters

Significantly the maximum plant height at 50, 70 and 90 DAS (164.21, 179.03 and 196.17 cm, respectively) recorded with treatment T_{10} (60% RDN through chemi. Ferti. + 40% N through castor cake + soil application of *jivamrut* @ 500 l/ha) and it was at par with T_9 (60% RDN through chemi. Ferti. + 40% N through vermicompost + soil application of *jivamrut* @ 500 l/ha), T_8 (60% RDN through chemi. Ferti. + 40% N through FYM + soil application of *jivamrut* @ 500 l/ha), T_7 (75% RDN through chemi. Ferti. + 25% N through castor cake + soil application of *jivamrut* @ 500 l/ha) as well as T_6 (75% RDN through chemi. Ferti. + 25% N through vermicompost + soil application of *jivamrut* @ 500 l/ha). The minimum plant height of 129.37, 145.90 and 160.43 cm at 50, 70 and 90 DAS, respectively was recorded with treatment T_1 (20:40:00 NPK kg/ha i.e. RDF) (Table 2).

The maximum number of branches (5.07 and 8.00 at 50 and 70 DAS, respectively) recorded with treatment T_{10} (60% RDN through chemi. Ferti. + 40% N through castor cake + soil application of *jivamrut* @ 500 l/ha) and it remained at par with treatment T_9 (60% RDN through chemi. Ferti. + 40% N through vermicompost + soil application of *jivamrut* @ 500 l/ha), T_8 (60% RDN through chemi. Ferti. + 40% N through FYM + soil application of *jivamrut* @ 500 l/ha) as well as T_7 (75% RDN through chemi. Ferti. + 25% N through castor cake + soil application of *jivamrut* @ 500 l/ha). At 90 DAS the maximum number of branches (9.79) was recorded with treatment T_{10} (60% RDN through chemi. Ferti. + 40% N through castor cake + soil application of *jivamrut* @ 500l/ha) and it remained at par with treatment T_9 (60% RDN through chemi. Ferti. + 40% N through vermicompost + soil application of *jivamrut* @ 500 l/ha), T_8 (60% RDN through chemi. Ferti. + 40% N through FYM + soil application of *jivamrut* @ 500 l/ha), T_7 (75% RDN through chemi. Ferti. + 25% N through castor cake + soil application of *jivamrut* @ 500 l/ha), T_6 (75% RDN through chemi. Ferti. + 25% N through vermicompost + soil application of *jivamrut* @ 500 l/ha), T_5 (75% RDN through chemi. Ferti. + 25% N through FYM + soil application of *jivamrut* @ 500 l/ha) and T_4 (75% RDN through chemi. Ferti. + 25% N through castor cake). The treatment T_1 (20:40:00 NPK kg/ha) exhibited minimum number of branches of 3.24, 6.17 and 7.31 at 50, 70 and 90 DAS, respectively (Table 2). Better performance of treatment T_{10} (60% RDN through chemi. Ferti. + 40% N through castor cake + soil application of *jivamrut* @ 500 l/ha) with respect to number of branches might be due to lower C: N ratio of castor cake which resulted in mineralization and increased availability of nitrogen to the plant throughout the crop growth period. These results are in conformity with the findings of Patel and Pathak (2002) [4] as well as Bijarnia *et al*. (2013) [5].

The maximum leaf area at 50, 70 and 90 DAS was found under the treatment T_{10} (60% RDN through chemi. Ferti. + 40% N through castor cake + soil application of *jivamrut* @ 500 l/ha) (197.05, 224.05 and 231.38 cm^2, respectively) and LAI (0.050, 0.055 and 0.057 at 50, 70 and 90 DAS, respectively) which was at par with treatment 60% RDN through chemi. Ferti. + 40% N through vermicompost + soil application of *jivamrut* @ 500 l/ha (T_9) and T_8 (60% RDN through chemi. Ferti. + 40% N through FYM + soil application of *jivamrut* @ 500 l/ha) whereas, the lowest leaf area (121.35, 136.35 and 143.35 cm^2, respectively) and LAI (0.032, 0.033 and 0.035, respectively) was observed with RDF (20:40:00 NPK kg/ha) *i.e.* T_1 (Table 3). The reason might be due to high rate of mineralization of organic nitrogen due to lowering the C: N ratio by adding castor cake and more availability of organic carbon for multiplication of micro-organisms and this helped in improving the N and P availability in soil by increased microbial activities which resulted in higher plant height. These results are substantiated with Shrivastava and Ahlawat (1995) [6] in pigeon pea and

Baboo *et al.* (1992) [7] in cluster bean. The increase in leaf area in response to an increased in N fertilizer probably due to enhanced availability of nitrogen to produce more leaves resulting in higher photo assimilates thereby, more dry matter accumulation (Boroujerdnia & Ansari, 2007) [8].

The maximum pod width (1.57 cm) at third picking was observed in treatment T_{10} (60% RDN through chemi. Ferti. + 40% N through castor cake + soil application of *jivamrut* @ 500 l/ha) which was at par with T_9 (60% RDN through chemi. Ferti. + 40% N through vermicompost + soil application of *jivamrut* @ 500 l/ha) and T_8 (60% RDN through chemi. Ferti. + 40% N through FYM + soil application of *jivamrut* @ 500 l/ha). The maximum pod width (1.50 cm) at fifth picking was observed in treatment T_{10} (60% RDN through chemi. Ferti. + 40% N through castor cake + soil application of *jivamrut* @ 500 l/ha) which was at par with T_9 (60% RDN through chemi. Ferti. + 40% N through vermicompost + soil application of *jivamrut* @ 500 l/ha), T_8 (60% RDN through chemi. Ferti. + 40% N through FYM + soil application of *jivamrut* @ 500 l/ha) and T_7 (75% RDN through chemi. Ferti. + 25% N through castor cake + soil application of *jivamrut* @ 500 l/ha). However, the minimum pod width at third and fifth picking (1.28 and 1.23 cm, respectively) was recorded in T_1 (20:40:00 NPK kg/ha) (Table 4). There is increased and prolonged availability of nutrients from castor cake with *rhizobium* as seed treatment, which boosted vegetative growth due to increased cell division and meristematic cell elongation in the auxiliary buds, which triggered various activities and increased photosynthesis supply, resulting in an increased pod width. These findings are in consistent with findings of Kumpavat (2006) [9].

The significantly the maximum weight of ten pods (28.69 g) at third picking was noted with treatment T_{10} (60% RDN through chemi. Ferti. + 40% N through castor cake + soil application of *jivamrut* @ 500 l/ha) and it remained at par with treatment of 60% RDN through chemi. Ferti. + 40% N through vermicompost + soil application of *jivamrut* @ 500 l/ha (T_9), treatment of 60% RDN through chemi. Ferti. + 40% N through FYM + soil application of *jivamrut* @ 500 l/ha (T_8) as well as treatment of 75% RDN through chemi. Ferti. + 25% N through castor cake + soil application of *jivamrut* @ 500 l/ha (T_7). The maximum weight of ten pods (29.95 g) at fifth picking was noted with application of 60% RDN through chemi. Ferti. + 40% N through castor cake + soil application of *jivamrut* @ 500 l/ha (T_{10}) and it remained at par with treatment of 60% RDN through chemi. Ferti. + 40% N through vermicompost + soil application of *jivamrut* @ 500 l/ha (T_9), treatment of 60% RDN through chemi. Ferti. + 40% N through FYM + soil application of *jivamrut* @ 500 l/ha (T_8), treatment of 75% RDN through chemi. Ferti. + 25% N through castor cake + soil application of *jivamrut* @ 500 l/ha (T_7), treatment of 75% RDN through chemi. Ferti. + 25% N thro ugh vermicompost + soil application of *jivamrut* @ 500 l/ha (T_6), as well as treatment of 75% RDN through chemi. Ferti. + 25% N through FYM + soil application of *jivamrut* @ 500 l/ha (T_5). The treatment of RDF *i.e.* 20:40:00 NPK kg/ha (T_1) recorded the minimum ten pod weight of 23.93 and 24.83 g at third and fifth picking, respectively (Table 4). There is also a better efficacy of all combined use of fertilizer, bio-fertilizer and castor cake over control might be due to availability and uptake of more plant nutrients, resulting more photosynthetic area and translocation of photosynthates resulted in increase in pod fresh weight. The finding is in harmony with Singh and Verma (2002) [10] and Ramana *et al.* (2010) [11] in French bean.

The maximum pod yield per plot and per hectare (9.36 kg and 9.63 t, respectively) was recorded in treatment T_{10} (60% RDN through chemi. Ferti. + 40% N through castor cake + soil application of *jivamrut* @ 500 l/ha) which was at par with treatment T_9 (60% RDN through chemi. Ferti. + 40% N through vermicompost+ soil application of *jivamrut* @ 500 l/ha), T_8 (60% RDN through chemi. Ferti. + 40% N through FYM + soil application of *jivamrut* @ 500 l/ha), T_6 (75% RDN through chemi. Ferti. + 25% N through vermicompost + soil application of *jivamrut* @ 500 l/ha), T5 (75% RDN through chemi. Ferti. + 25% N through FYM +soil application of *jivamrut* @ 500 l/ha) as well as T_4 (75% RDN through chemi. Ferti. + 25% N through castor cake) while in treatment T_1 (20:40:00 NPK kg/ha) the minimum pod yield per plot and per hectare (6.15 kg and 6.32 t) was reported (Table 4). It could be because of the application of nitrogen and phosphate, as well as organic manure and bio fertilizer, which promotes root growth and shoot development. Better vegetative development is aided by nitrogen. This requires increased phosphorus absorption. Phosphorus was delivered to the roots via diffusion nutrient then diffused slowly from the area of higher concentration to the area of lower concentration. These results are in agreement with those of Meisheri (1973) [12] and Baboo *et al.* (1992) [7].

Conclusions

From the present investigation it can be concluded that among different treatments of integrated nutrient management, the treatment 60% RDN through chemi. Ferti. + 40% N through castor cake + soil application of *jivamrut* @ 500 l/ha found better in growth and yield attributes of Indian bean.

Table 2: Effect of integrated nutrient management on growth parameters of Indian bean cv. Gujarat papadi-1

Treatment		Plant height (cm)			Number of branches		
		At 50 DAS	At 70 DAS	At 90 DAS	At 50 DAS	At 70 DAS	At 90 DAS
T_1	RDF (20:40:00 NPK kg/ha)	129.37^{c*}	145.90^{d}	160.43^{d}	3.24^{b}	6.17^{d}	7.31^{c}
T_2	75% RDN through chemi. Ferti. + 25% N through FYM	131.53^{c}	147.07^{cd}	162.26^{cd}	3.57^{b}	6.73^{bcd}	8.08^{bc}
T_3	75% RDN through chemi. Ferti. + 25% N through vermicompost	132.05^{c}	150.40^{cd}	163.68^{cd}	3.67^{b}	6.70^{bcd}	8.21^{bc}
T_4	75% RDN through chemi. Ferti. + 25% N through castor cake	134.87^{bc}	153.13^{bcd}	165.83^{cd}	3.78^{b}	6.80^{bcd}	8.43^{abc}
T_5	75% RDN through chemi. Ferti. + 25% N through FYM + soil application of *jivamrut* @ 500 l/ha	137.14^{bc}	155.43^{bcd}	169.60^{bcd}	3.50^{b}	6.87^{bcd}	8.48^{abc}
T_6	75% RDN through chemi. Ferti. + 25% N through vermicompost + soil application of *jivamrut* @ 500 l/ha	140.62^{abc}	157.23^{abcd}	173.11^{abcd}	3.74^{b}	6.48^{cd}	8.36^{abc}
T_7	75% RDN through chemi. Ferti. + 25% N through castor cake + soil application of *jivamrut* @ 500 l/ha	144.96^{abc}	165.40^{abcd}	179.55^{abcd}	4.53^{a}	7.07^{abcd}	9.16^{ab}
T_8	60% RDN through chemi. Ferti. + 40% N through FYM + soil application of *jivamrut*	150.42^{abc}	169.07^{abc}	185.22^{abc}	4.70^{a}	7.40^{abc}	9.09^{ab}

	@ 500 l/ha						
T_9	60% RDN through chemi. Ferti. + 40% N through vermicompost + soil application of *jivamrut* @ 500 l/ha	157.35^{ab}	174.43^{ab}	191.32^{ab}	4.57^{a}	7.72^{ab}	9.37^{ab}
T_{10}	60% RDN through chemi. Ferti. + 40% N through castor cake+ soil application of *jivamrut* @ 500 l/ha	164.21^{a}	179.03^{a}	196.17^{a}	5.07^{a}	8.00^{a}	9.79^{a}
	S. Em. ±	7.34	6.56	7.30	0.18	0.33	0.42
	C.D. at 5 %	21.81	19.49	21.71	0.55	1.00	1.26
	CV (%)	8.93	7.11	7.24	7.93	8.32	8.50

*Note: Treatment means with the letter/letters in common are not significantly different by Duncan's New Multiple Range Test at 5% level of significance

Table 3: Effect of integrated nutrient management on growth parameters of Indian bean cv. Gujarat papadi-1

Treatment		Leaf area (cm^2)			Leaf Area Index		
		At 50 DAS	At 70 DAS	At 90 DAS	At 50 DAS	At 70 DAS	At 90 DAS
T_1	RDF (20:40:00 NPK kg/ha)	121.35^{e*}	136.35^{f}	143.35^{f}	0.032^{e}	0.033^{e}	0.035^{f}
T_2	75% RDN through chemi. Ferti. + 25% N through FYM	125.31^{e}	145.31^{ef}	152.31^{ef}	0.033^{e}	0.035^{e}	0.038^{ef}
T_3	75% RDN through chemi. Ferti. + 25% N through vermicompost	134.39^{de}	150.39^{def}	155.39^{ef}	0.035^{de}	0.037^{de}	0.038^{ef}
T_4	75% RDN through chemi. Ferti. + 25% N through castor cake	134.31^{de}	152.51^{def}	160.31^{def}	0.035^{de}	0.037^{de}	0.040^{def}
T_5	75% RDN through chemi. Ferti. + 25% N through FYM + soil application of *jivamrut* @ 500 l/ha	143.31^{cde}	161.98^{cde}	172.98^{cde}	0.037^{cde}	0.039^{cde}	0.043^{cde}
T_6	75% RDN through chemi. Ferti.+ 25% N through vermicompost + soil application of *jivamrut* @ 500 l/ha	154.96^{cd}	171.96^{cd}	184.96^{bcd}	0.040^{cd}	0.042^{cd}	0.046^{bcd}
T_7	75% RDN through chemi. Ferti.+ 25% N through castor cake + soil application of *jivamrut* @ 500 l/ha	166.25^{bc}	183.25^{bc}	193.25^{bc}	0.043^{bc}	0.045^{bc}	0.048^{bc}
T_8	60% RDN through chemi. Ferti. + 40% N through FYM + soil application of *jivamrut* @ 500 l/ha	181.55^{ab}	200.89^{ab}	208.89^{ab}	0.047^{ab}	0.049^{ab}	0.052^{ab}
T_9	60% RDN through chemi. Ferti. + 40% N through vermicompost+ soil application of *jivamrut* @ 500 l/ha	191.00^{ab}	212.00^{a}	222.00^{a}	0.049^{ab}	0.052^{a}	0.055^{a}
T_{10}	60% RDN through chemi. Ferti. + 40% N through castor cake+ soil application of *jivamrut* @ 500 l/ha	197.05^{a}	224.05^{a}	231.38^{a}	0.050^{a}	0.055^{a}	0.057^{a}
	S. Em. ±	7.767	7.837	7.571	0.002	0.002	0.002
	C.D. at 5 %	23.08	23.28	22.49	0.006	0.006	0.006
	CV (%)	8.68	7.806	7.18	8.253	7.896	7.293

*Note: Treatment means with the letter/letters in common are not significantly different by Duncan's New Multiple Range Test at 5% level of significance

Table 4: Effect of integrated nutrient management on yield parameters and yield of Indian bean cv. Gujarat papadi-1

Treatment		Number of pod /plant	Length of pod		Width of pod		Ten green pod weight		Green pod yield	
			At 3rd picking	At 5th picking	At 3rd picking	At 5th picking	At 3rd picking	At 5th picking	kg/plot	t/ha
T_1	RDF (20:40:00 NPK kg/ha)	210.25^{d}	5.14^{d}	5.21^{d}	1.28^{c}	1.23^{d}	23.93^{c}	24.83^{c}	6.15^{d}	6.32^{d}
T_2	75% RDN through chemi. Ferti.+ 25% N through FYM	213.58^{d}	5.20^{cd}	5.29^{d}	1.38^{bc}	1.33^{cd}	23.95^{c}	24.87^{c}	6.72^{cd}	6.92^{cd}
T_3	75% RDN through chemi. Ferti. + 25% N through vermicompost	217.03^{cd}	5.27^{cd}	5.38^{d}	1.41^{bc}	1.35^{bcd}	24.05^{c}	25.70^{c}	7.68^{bc}	7.90^{bc}
T_4	75% RDN through chemi. Ferti. + 25% N through castor cake	220.55^{bcd}	5.41^{bcd}	5.43^{cd}	1.40^{bc}	1.34^{cd}	24.95^{bc}	26.79^{bc}	8.21^{ab}	8.45^{ab}
T_5	75% RDN through chemi. Ferti. + 25% N through FYM +soil application of *jivamrut* @ 500 l/ha	224.75^{abcd}	5.39^{bcd}	5.48^{bcd}	1.39^{bc}	1.35^{bcd}	25.06^{bc}	27.35^{abc}	8.25^{ab}	8.49^{ab}
T_6	75% RDN through chemi. Ferti. + 25% N through vermicompost + soil application of *jivamrut* @ 500 l/ha	226.26^{abcd}	5.32^{bcd}	5.53^{bcd}	1.39^{bc}	1.34^{cd}	25.15^{bc}	27.42^{abc}	8.24^{ab}	8.48^{ab}
T_7	75% RDN through chemi. Ferti. + 25% N through castor cake + soil application of *jivamrut* @ 500 l/ha	234.46^{abc}	5.41^{abcd}	5.58^{abcd}	1.42^{b}	1.37^{abc}	25.69^{abc}	27.51^{abc}	7.42^{bc}	7.64^{bc}
T_8	60% RDN through chemi. Ferti. + 40% N through FYM + soil application of *jivamrut* @ 500 l/ha	239.83^{ab}	5.75^{abc}	5.95^{abc}	1.47^{ab}	1.43^{abc}	26.31^{abc}	28.78^{ab}	9.01^{a}	9.27^{a}
T_9	60% RDN through chemi. Ferti. + 40% N through vermicompost+ soil application of *jivamrut* @ 500 l/ha	241.83^{a}	5.86^{ab}	6.00^{ab}	1.50^{ab}	1.48^{ab}	27.54^{ab}	29.31^{ab}	9.10^{a}	9.36^{a}
T_{10}	60% RDN through chemi. Ferti. + 40% N through castor cake+ soil application of *jivamrut* @ 500 l/ha	244.06^{a}	5.95^{a}	6.09^{a}	1.57^{a}	1.50^{a}	28.69^{a}	29.95^{a}	9.36^{a}	9.63^{a}
	S. Em. ±	5.92	0.17	0.16	0.04	0.04	1.00	0.81	0.38	0.37
	C.D. (P=0.05)	17.61	0.52	0.48	0.13	0.12	2.98	2.41	1.08	1.13
	CV %	4.51	5.50	5.03	5.35	5.12	6.79	5.16	8.21	8.21

*Note: Treatment means with the letter/letters in common are not significantly different by Duncan's New Multiple Range Test at 5% level of significance.

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