



International Journal of Research in Agronomy

E-ISSN: 2618-0618
P-ISSN: 2618-060X
© Agronomy
NAAS Rating: 5.20
www.agronomyjournals.com
2025; 8(7): 557-560
Received: 13-05-2025
Accepted: 19-06-2025

M Arun Raj
Subject Matter Specialist, Krishi
Vigyan Kendra, Theni, Tamil
Nadu, India

P Maheshwaran
Subject Matter Specialist, Krishi
Vigyan Kendra, Theni, Tamil
Nadu, India

M David Israel Mansingh
Assistant Professor, SRSIAT,
Dindigul, Tamil Nadu, India

Effect of novel organic liquid on improving the yield and economics of groundnut in rainfed condition

M Arun Raj, P Maheshwaran and M David Israel Mansingh

DOI: <https://www.doi.org/10.33545/2618060X.2025.v8.i7g.3247>

Abstract

On Farm Testing (OFT) experiment was conducted to study the effect of novel organic liquid on improving the yield and economics of Groundnut (var VRI 9) in rain fed condition at five different farmers' fields of Ethakovil village during Kharif season 2022. The experiment was laid out in Randomized Block Design and replicated in thrice with the following treatments. T₁ - RDF through chemical fertilizer, T₂- NOVEL Organic Liquid @ 2ml/L for 2 times and T₃- TNAU groundnut rich @ 5.0 kg/ha (for each spray) at 35 DAS (50 per cent flowering) and 45 DAS (Pod developing stage) in 500 litres of water is recommended. The results revealed that the foliar application of Novel organic liquid @ 2ml/L for 2 times (T₂) along with recommended dose of fertilizers was proved to be most effective in plant height (54.7cm), no. of branches per plant (6), no. of pods per plant (36), haulm yield (3620 kg/ha), pod yield (1960 kg/ha) and highest B: C ratio (2.34) in rainfed condition.

Keywords: Groundnut; foliar nutrition; novel organic liquid; yield and B: C ratio

Introduction

Groundnut (*Arachis hypogaea* L.) is an important oilseed and supplementary food crop of the world. It is fourth most important source of edible oil and third most important source of vegetable protein. It belongs to family *Leguminaceae*. Groundnut Seed contain 40-50 per cent oil content (more oleic acid, less linoleic acid), while carbohydrates and protein percentage is 18 and 25 per cent respectively. It is premier oilseed crop of India popularly known as peanut, monkey nut, manila nut. India ranks first in respect of area and second in production after China. Globally, the crop is raised on 26.4 million hectares with a total production of 37.1 million MT. In India, it is cultivated over an area of 4596.33 in hectares with production of 6733.33 MT. The average productivity is 1400 kg/ha (Anon, 2017). India accounts for about 27 per cent of global area and contributes 19 per cent to world groundnut production (Rai *et al.*, 2016)^[8]. Tamil Nadu ranks fourth in terms of groundnut area (4.419 lakh ha) and third in production (9.737 lakh tonnes) (Singh, 2014). Globally, 50% of groundnut is used for oil extraction, 37% confectionary and 12% for seed purpose.

Micronutrients are essential elements that are used by plants in small quantities. Yield and quality of agricultural products increased with micronutrients application, therefore human and animal health is protected with feed of enrichment plant materials. Each essential element can perform its role in plant nutrition properly that other necessary elements are available in balanced ratios for plant (Tavakoli *et al.*, 2014)^[9]. Oils and fats play an essential role for humans as they are good source of energy for human life. The major eight fatty acids in groundnut oil seed, i.e. palmitic (16:0), arachidic (20:0), lignoceric (24:0), oleic (18:1), stearic (18:0), linoleic (18:2), behenic (22:0) and eicosenoic (20:1). On the other side, oleic acid accounted a monounsaturated fatty acid and linoleic acid considered a polyunsaturated fatty acid represented about 75 to 80% of the total fatty acids composition in groundnut oil. The residual of total fatty acid represented about 20%, among them, palmitic acid represented about 10 per cent. In addition to, oleic considered profitable in prohibiting cancer, increasing insulin allergy and improving some inflammatory diseases.

Zinc, Manganese and Boron are an essential micronutrient involved in a wide variety of physiological processes. The main functions of zinc are tendency to make up tetragonal

Corresponding Author:

M Arun Raj
Subject Matter Specialist, Krishi
Vigyan Kendra, Theni, Tamil
Nadu, India

complexes with nitrogen, oxygen and sulfur, thus zinc have a catalytic, building and activating role in the enzymes. Zinc is main building part of some enzymes and is needed for the plant enzymes formation; in addition, many enzymatic reactions active by zinc Galavi *et al.*, 2011 and Maleki *et al.*, 2014)^[3, 5]. However, Manganese has important role on activates several enzymes which involve the oxidation reactions, carboxylation, carbohydrates metabolism, phosphorus reactions and citric acid cycle.

The ICAR introduced on farm testing (OFT) for evaluation of performance NOVEL organic liquid on improving the yield and economics of groundnut in rainfed condition. The main objective of the trail is evaluating the NOVEL organic liquid under the real farming situation. The present study has been undertaken to assess the performance of NOVEL organic liquid on improving the yield and economics of groundnut in rainfed condition.

Materials and Methods

The on farm testing (OFT) experiment was conducted at farmer field of Ethakovil village of Theni District during Kharif 2022-23. The experiment trail was conducted to assess the performance NOVEL organic liquid on improving the yield and economics of groundnut in rainfed condition. The soil type of the trail plots is sandy clay loam in texture with low organic carbon (0.32 - 0.34%), available nitrogen (282 - 295 kg ha⁻¹), available phosphorous (8.45 - 9.65 kg ha⁻¹) and available potassium (167 - 179 kg ha⁻¹). The experiment was laid out in Randomized Block Design and replicated in thrice with the following treatments. T₁ - RDF through chemical fertilizer, T₂- NOVEL Organic Liquid @ 2ml/L for 2 times along with RDF and T₃- TNAU groundnut rich @ 5.0 kg/ha (for each spray) along with RDF at 35 DAS (50 per cent flowering) and 45 DAS (Pod developing stage) in 500 litres of water is recommended. The recommended doses of fertilizer were applied at the time of field preparation as a basal dose. Each trail plot was conducted in 0.4 ha. The primary data collected from the farmers with help of the interview schedule and direct field measurement. Appropriate need based plant protection measures were taken up to control the pest and diseases following the recommended

package of practices as per the Crop Production Guide.

Results and Discussion

Plant height

The plant height was significantly influenced by the application of crop boosters along with recommended dose of fertilizers. The highest plant height of 54.7 cm was recorded in the treatment received the NOVEL Organic Liquid @ 2ml/L for 2 times along with recommended dose of fertilizers (T₂) followed by application of TNAU groundnut rich @ 5.0 kg/ha (for each spray) at 35 DAS (50% flowering) and 45 DAS (Pod developing stage) in 500 litres of water with recommended dose of fertilizers (51.2 cm). The lowest plant height (44.2 cm) was observed in control (T₁). The highest plant height was recorded in NOVEL Organic Liquid this might be due to the fostered meristematic activities which was catalyzed by growth regulator contains in Novel Plus Organic Liquid Nutrient viz., gibberellic acid, naphthalene acetic acid and cytokinin which leads to enhance cell division and cell elongation (Desai *et al.*, 2018)^[2]. Besides this might be due to the ample amount of nitrogen content of liquid nutrient which enhances cell division, cell elongation as well as formation of more tissues resulting in luxuriant vegetative growth which leads to increase in plant height (Chotaliya *et al.*, 2018)^[1].

Number of branches per plant

Number of leaves per plant was appreciably influenced by application of crop boosters along with recommended dose of fertilizers when compared to control. Among the various treatments, the application of NOVEL Organic Liquid @ 2ml/L for 2 times along with recommended dose of fertilizers (T₂) has recorded maximum number of leaves per plant (6) which was statistically on par with the treatment receiving TNAU groundnut rich @ 5.0 kg/ha (for each spray) at 35 DAS (50% flowering) and 45 DAS (Pod developing stage) in 500 litres of water (5). The minimum number of leaves per plant (3) was recorded in control (T₁). The increase in number of leaves is attributed to the luxurious and overall promotion in the vegetative growth (Naik 2006)^[6].

Table 1: Effect of crop boosters on growth and yield of Groundnut under rainfed condition

Treatments	Plant height (cm)	No. of branches per plant	No. of pods per plant	Haulm yield (kg/ha)	Pod Yield (kg/ha)
T ₁ - RDF through chemical fertilizer	44.2	3	24.7	2860	1520
T ₂ - NOVEL Organic Liquid @ 2 ml/L for 2 times	54.7	6	36.0	3620	1960
T ₃ - TNAU groundnut rich @ 5.0 kg/ha (for each spray) at 35 DAS (50% flowering) and 45 DAS (Pod developing stage) in 500 litres of water	51.2	5	30.5	3460	1850
SEd	1.30	0.42	1.73	74.4	51.2
CD (0.05%)	2.7	0.89	3.6	154	106

Number of pods per plant

Significant variation in number of pods per plant was observed with application of crop boosters along with recommended dose of fertilizers. The observation on number of pods per plant revealed increase in the treatment which received NOVEL Organic Liquid @ 2ml/L for 2 times along with recommended dose of fertilizers (36.0 per plant) followed by application of TNAU groundnut rich @ 5.0 kg/ha (for each spray) at 35 DAS

(50% flowering) and 45 DAS (Pod developing stage) in 500 litres of water with recommended dose of fertilizers (30.5 cm). The number of pods per plant of 24.7 was observed in control (T₁). The number of pods per plant increases might be due to the Novel Plus organic nutrient provides macro and micro nutrient at critical stages as well as improves photosynthetic activity which increases the production of carbohydrates and photosynthates (Kalariya *et al.*, 2018)^[4].

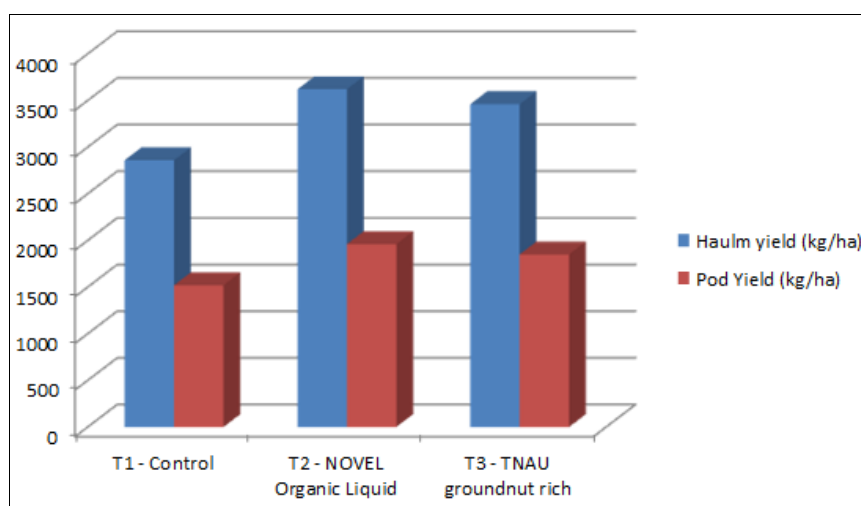


Fig 1: Effect of crop boosters on yield of Groundnut under rainfed condition

Haulm yield

The effect of various treatments that received different crop boosters along with recommended dose of fertilizers had a significant effect on haulm yield. The maximum haulm yield of 3620 kg/ha was observed in the treatment which received NOVEL Organic Liquid @ 2ml/L for 2 times along with recommended dose of fertilizers (T₂) followed by the treatment receiving TNAU groundnut rich @ 5.0 kg/ha (for each spray) at 35 DAS (50% flowering) and 45 DAS (Pod developing stage) in 500 litres of water with recommended dose of fertilizers along with recommended dose of fertilizers with a haulm yield of 3460 kg/ha. The lowest haulm yield of 3020 kg/ha was recorded in control (T₁). This might be due to the luxurious and overall promotion in the vegetative growth (Naik 2016) [6]. Another feasible reason behind these results might be the greater accumulation of photosynthates by vegetative parts as well as the efficient partitioning of photosynthates towards the sink (Chotaliya *et al.*, 2018) [1].

Pod yield

Significant difference in the pod yield was observed due to various treatments which received different crop boosters. The maximum pod yield of 1960 kg/ha was recorded in the treatment which received NOVEL Organic Liquid @ 2ml/L for 2 times along with recommended dose of fertilizers (T₂) followed by the

treatment that application of TNAU groundnut rich @ 5.0 kg/ha (for each spray) at 35 DAS (50% flowering) and 45 DAS (Pod developing stage) in 500 litres of water with recommended dose of fertilizers with a pod yield of 1850 kg/ha. The lowest pod yield of 1520 kg/ha in control (T₁). This might be due to due to Novel Plus organic nutrient provides macro and micro nutrient at critical stages as well as improves photosynthetic activity which increases the production of carbohydrates and photosynthates. It also improves the allocation of photosynthates towards the economic part i.e., pods which ultimately contributes towards the increase in number of pods and quantitative traits (Kalariya *et al.*, 2018) [4].

Economic Impact

Economics of raising a particular crop plays a vital role in making recommendations for adoption of a technology to the farmers. The data pertaining to gross returns, net returns and B:C ratio are presented in Table 2. The highest gross return (Rs. 96040 ha⁻¹) and net return (Rs. 54540 ha⁻¹) were recorded in the treatment which received NOVEL Organic Liquid @ 2ml/L for 2 times along with recommended dose of fertilizers (T₂). The highest B:C ratio (2.31) was recorded in the treatment which received NOVEL Organic Liquid @ 2ml/L for 2 times along with recommended dose of fertilizers (T₂).

Table 2: Economic parameters of different crop boosters

Treatments	Cost of Cultivation (Rs ha ⁻¹)	Gross Income (Rs ha ⁻¹)	Net income (Rs ha ⁻¹)	B:C ratio
T ₁ - RDF through chemical fertilizer	37500	69920	32420	1.86
T ₂ - NOVEL Organic Liquid @ 2ml/L for 2 times	41500	96040	54540	2.31
T ₃ - TNAU groundnut rich @ 5.0 kg/ha (for each spray) at 35 DAS (50% flowering) and 45 DAS (Pod developing stage) in 500 litres of water	40200	88800	48600	2.21

Data statistically not analysed

Conclusion

Based on the results of the above study, it is concluded that the application NOVEL Organic Liquid @ 2ml/L for 2 times along with recommended dose of fertilizers (T₂) can be recommended to get profitably higher yield besides improving the growth and yield of groundnut under rainfed condition. Over all, from the experimental results, it could be enlightened that application of NOVEL Organic Liquid @ 2ml/L for 2 times along with recommended dose of fertilizers could be considered as a better option for achieving higher productivity and profitability of

groundnut under rainfed condition.

References

- Chotaliya K, Masaye SS, Anjali P. Effect of different levels of nitrogen and novel organic liquid fertilizer on growth and soil properties of Okra [*Abelmoschus esculentus* (L.) Moench] cv. GAO 5. Int J Chem Stud. 2018;6(5):3077-81.
- Desai SA, Patel B, Naik PR, Patel V. Effect of plant growth enhancers on growth and flowering of tuberose cv. Prajwal. Int J Chem Stud. 2018;6(6):1076-9.

3. Galavi M, Yosefi K, Ramrodi M, Mousavi SR. Effect of bio-phosphate and chemical phosphorus fertilizer accompanied with foliar application of micronutrients on yield, quality and phosphorus and zinc concentration of maize. *J Agric Sci.* 2011;3(4):22-9.
4. Kalariya VD, Bhanderi DR, Patel NK, Vaghasiya JM. Effect of foliar application of micronutrients, novel organic liquid fertilizer and sea weed extract on yield of okra [*Abelmoschus esculentus* (L.) Moench]. *Int J Chem Stud.* 2018;6(3):1834-6.
5. Maleki A, Fazel S, Naseri R, Rezaei K, Heydari M. The effect of potassium and zinc sulfate application on grain yield of maize under drought stress conditions. *Adv Environ Biol.* 2014;8(4):890-3.
6. Naik VM. Effect of Triaccontanol, NAA, GA₃ on growth and yield of Indian bean (*Lablab purpureus* L.) cv. Navsari papadi selection - 1 [MSc thesis]. Navsari: Navsari Agricultural University; 2006.
7. Nassar ANM, Osman EEA. Effect of micronutrients and weed control treatments on peanut yield and associated weeds under sandy soil conditions. *Assiut J Agric Sci.* 2008;39(3):191-223.
8. Rai SK, Deeksha, Bharat R. Scenario of oilseed crops across the globe. *Plant Arch.* 2016;16(1):125-32.
9. Tavakoli MT, Chenari AI, Rezaie M, Tavakoli A, Shahsavari M, Mousavi SR. The importance of micronutrients in agricultural production. *Adv Environ Biol.* 2014;8(10):31-5.