Int.J.Curr.Microbiol.App.Sci (2019) *8*(5): 3229-3231

International Journal of Current Microbiology and Applied Sciences
***ISSN: 2319-7706* Volume 8 Number 06 (2019)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2019.806.384

Transplanted Rice as Influenced by Different Enriched Nitrogen Sources-An Economic Appraisal

N. Prathap Reddy*, CH. Bharat Bhushan Rao, K. Surekha and S.A. Hussain

Professor Jayashankar Telangana State Agricultural University, Hyderabad-500030, Telangana, India

**Corresponding author*

Keywords

Randomized block design, Gross returns, Net returns, B: C ratio, Neem coated urea, Neem coated urea + nitrification inhibitor, Rice straw compost, Vermicompost

Article Info

Accepted:
18 May 2019
Available Online:
10 June 2019

A B S T R A C T

A field experiment was carried out during kharif, 2018 at the research farm of the ICAR, Indian Institute of Rice Research (IIRR), Hyderabad, Telangana state. The soil of the experimental field was clay loam in texture, low in available nitrogen, medium in phosphorus and high in potassium content. The experiment was laid out in randomized block design with eleven treatments and each one replicated thrice. Highest net returns Rs 92,658 ha-1 was recorded with the application of 100% RDN through neem coated urea. This was closely followed by 100% RDN through neem coated urea + nitrification inhibitor Rs 83,467 ha-1. Highest gross returns Rs 1,26,295 ha-1 was recorded with the application of 100% RDN through neem coated urea . This was closely followed by 100% RDN through neem coated urea + nitrification inhibitor Rs 1,17,151 ha-1. Highest B : C ratio (3.75) was recorded with the application of 100% RDN through neem coated urea . Lowest B:C ratio (1.22) was recorded with application of 100% RDN through vermicompost .

Introduction

Nitrogen is the key nutrient element required in large amounts for rice and provision of adequate supply of N throughout the growing period is necessary for realizing potential yields. Nitrogen promotes rapid plant growth and improves grain yield and grain quality through higher tillering, leaf area development, grain formation, grain filling, and protein synthesis. Presently 50% of human population relies on nitrogen fertilizer for food production (Ladha *et al.*, 2005).

Though N requirement is high the Nitrogen use efficiency of applied fertilizer nitrogen in rice crop is very low (30-50%) as nitrogen is subjected to several losses under flooded conditions. Slow-release fertilizers (SRF) are often used to increase nitrogen-use efficiency.

SRFs are designed to release N over an extended period of time, rather than all at once, in an attempt to better match plant N needs throughout the growing season and to reduce time of exposure for N losses to the environment (Ellison *et al.,* 2013).

Government of India has made it mandatory to manufacture 100% Urea as neem coated urea (NCU) to improve the N use efficiency in 2015.

Materials and Methods

A field experiment was carried out during *kharif,* 2018 at the research farm of the ICAR, Indian Institute of Rice Research (IIRR), Hyderabad, Telangana state. The experiment was laid out in randomized block design with eleven treatments and each one replicated thrice.

The experimental field has pH 8.2, EC 0.59 (ds m^{-1}), OC 0.62%, available N (239 kg ha^{-1}), available P (36 kg ha^{-1}) and available K (407 kg ha^{-1}).

The treatments comprised were T_1 Control (0:60:40 kg N:P:K ha^{-1}), T_2 (75% RDN through neem coated urea), T_3 (75% RDN through enriched rice straw compost with *trichoderma*) T_4 (75% RDN through vermicompost), T_5 (75% RDN through neem coated urea + nitrification inhibitor), T_6 (75% RDN (50% RDN through vermicompost + 25% RDN through neem coated urea + nitrification inhibitor), T_7 (100% RDN through neem coated urea), T_8 (100% RDN through enriched rice straw compost with *trichoderma*), T_9 (100% RDN through vermicompost), T_{10} (100% RDN through neem coated urea + nitrification inhibitor) and T_{11} (100% RDN (50% RDN through vermicompost + 50% RDN through neem coated urea + nitrification inhibitor).

Results and Discussion

Cost of cultivation (Rs ha^{-1})

Highest cost of cultivation was recorded with 100% RDN through vermicompost (T_9) (Rs.64,108). Application of entire dose of required nitrogen in the form of vermicompost resulted in high cost of cultivation. Lowest cost of cultivation was recorded without the application of nitrogen (Rs. 31,108) (T_1).

Gross returns (Rs ha^{-1})

Highest gross returns was recorded with the application of 100% neem coated urea (T_7) (Rs.1,26,295). Lowest gross returns was recorded without the application of nitrogen (Rs.59,233).

Net returns (Rs ha^{-1})

Highest net returns was recorded with the application of 100% neem coated urea (T_7) (Rs.92,658).This was closely followed by 100% RDN through neem coated urea + nitrification inhibitor (T_{10}) (Rs.83,467). Lowest net returns was recorded with the application of 100% RDN through vermicompost (T_4) (Rs.13,494). Application of 100% of nitrogen as vermicompost was found to be uneconomical (Table 1).

B: C ratio (%)

Highest B:C ratio was recorded with the application of 100% neem coated urea (T_7) (3.75). This was closely followed by application of 100% RDN through neem coated urea + nitrification inhibitor (T_{10}) (3.48). Lowest B: C ratio was recorded with the application of 100% RDN through Vermicompost (T_9) (1.22). Similar findings were reported by Sarangi *et al.,* (2016)

Table.1 Economics of transplanted rice as influenced by different enriched nitrogen sources

Treatments	Cost of cultivation (Rs ha^{-1})	Gross returns (Rs ha^{-1})	Net returns (Rs ha^{-1})	B:C ratio
T_1- Control (0:60:40 kg N:P:K ha^{-1})	31108	59233	28125	1.90
T_2- 75% RDN through neem coated urea	33255	103526	70271	3.11
T_3- 75% RDN through enriched rice straw compost with *Trichoderma*	42358	74324	31966	1.75
T_4- 75% RDN through vermicompost	55858	69352	13494	1.24
T_5- 75% RDN through neem coated urea + nitrification inhibitor	33290	96511	63221	2.90
T_6- 75% RDN (50% RDN through vermicompost +25% RDN through neem coated urea + nitrification inhibitor)	48002	84180	36178	1.75
T_7-100% RDN through neem coated urea	33637	126295	92658	3.75
T_8-100% RDN through enriched rice straw compost with *Trichoderma*	46108	82327	36219	1.79
T_9-100% RDN through vermicompost	64108	78091	13983	1.22
T_{10}-100% RDN through neem coated urea + nitrification inhibitor	33684	117151	83467	3.48
T_{11}-(100% RDN [50% RDN through vermicompost + 50% RDN through neem coated urea +nitrification inhibitor])	49396	106166	56770	2.14
SEm±	-	-	484	-
CD (p=0.05)	-	-	1428	-

The experiment revealed that application of 100% neem coated urea gave higher gross returns, net returns and B: C ratio when compared to other treatments.

References

Ellison, E., Blaylock A., Sanchez, C and Smith, R. 2013. Exploring controlled release nitrogen fertilizers for vegetable and melon crop production in California and Arizona Proceedings. *Western Nutrient Management Conference*. 10: 17-22.

Ladha, J.K., Pathak, H., Krupnik, T.J., Six, J and Kessel, C.V.2005. Efficiency of fertilizer nitrogen in cereal production: Retrospect's and prospects. *Advances in Agronomy*. 87:85-156.

Sarangi, S.K., Maji, B., Singh, S., Srivastava, A.K., Singh, U.S and Sharma, D.K. 2016. Nitrogen management through neem coated urea and application method further improve rice productivity in coastal flood-prone rainfed lowland. *International Agronomy Congress.* 2(4): 22-26.

How to cite this article:

Prathap Reddy, N. CH. Bharat Bhushan Rao, K.Surekha and Hussain, S.A. 2019. Transplanted Rice as Influenced by Different Enriched Nitrogen Sources-an Economic Appraisal. *Int.J.Curr.Microbiol.App.Sci.* 8(06): 3229-3231. doi: https://doi.org/10.20546/ijcmas.2019.806.384