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Original Research Article

Comparative Analysis of Adoption of Nutrient Management Packages by Paddy farmers of Nalgonda District, India

D. Shashank*, I. Sreenivasa Rao, A. Sailaja and M. Madhavi

Department of Agricultural Extension and Agronomy Professor Jayashankar Telangana State Agricultural University, Hyderabad, 500030, Telangana, India
**Corresponding author*

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Analysis, nutrient management, packages, adoption

A B S T R A C T

To know the adoption of nutrient management packages by paddy farmers of Nalgonda district, a study was conducted in Nalgonda district of Telangana. Five villages from three mandals were selected for the study. Thereafter, 90 farmers i.e., Six farmers from each village (3 State Agricultural University recommendation followers and 3 Farmers Practice followers) were interviewed for this study. The results showed that majority (68.9%) of SAU recommendation followers had medium level of adoption of nutrient management packages in paddy. But more number of farmers practice followers (75.6%) also fell in medium adoption category. SAU and FP follower had highly significant difference in their contact with farming experience, extension contact, information seeking and adoption of nutrient management practices.

Introduction

Rice (*Oryza sativa*. L) is an important staple food for about 70 per cent of the Asian population (nearly 3 billion people).

More than 75 per cent of rice worldwide is produced in irrigated rice lands and 90 per cent of these irrigated lands are found predominantly in Asia (Bouman *et al.*, 2006). The role of chemical fertilizers for increased agricultural production in particular in developing countries is well established. Some argue that fertilizer was as important as seed in the Green Revolution (Tomich *et al.*, 1995) contributing as much as 50 per cent of the yield growth in Asia (Hopper 1993 and FAO 1998). Others have found that one-third of the cereal production worldwide is due to the use of fertilizer and related factors of production (Bumb, 1995).

Fertilizer consumption in India has been increasing over the years and today India is one of the largest producer and consumer of fertilizers in the world. By 2009-10 total fertilizers consumption in the country was 26.49 million nutrient tonnes.

The consumption of chemical fertilizers (in terms of nutrients) during 2009- 2010 has been 264.86 lakh million tonnes, which is higher by 6.3 per cent over 2008-09 consumption. In the present days, the different nutrient management packages followed in rice crop includes Recommendations from State Agricultural Universities (SAUs), Research stations as well as farmers are adopting different doses of fertilizers (FP) based on their experience and other different socio economic reasons.

There is no single recommendation for rice fertilization which will fit all situations. Fertilizer application will vary considerably, depending on crop requirements, the availability of fertilizers, the financial resources of the farmer, and most importantly, the ability of the farmer to follow application schedules (some of which can be quite complicated). Tests and field experience under State Agricultural Universities have shown that the application of 40 kg/acre of nitrogen, 24 kg/acre of phosphorus, and 16 kg/acre of potassium gives optimum results under most local conditions of Telangana state.

Of course many farmers will be either unwilling or unable to purchase this amount of fertilizer; they will end up fertilizing at a much lower rate (or not at all). Decreasing the amount of fertilizer will result in more modest yields, but keep in mind that any amount of fertilizer, no matter how small, will help. If a farmer deeds to fertilize but can afford only one bag of N-P-K 15-15-15 kg per acre, don't necessarily discourage him/her If applied properly, even this relatively small amount of fertilizer will affect favorable results. Some of the farmers appear to be skilled in adopting fertilizer application practices. Instead of following the recommended practice, they slightly reduce the amount of NPK or mix NPK and urea fertilizers (Saidou *et al.*, 2004).

The practices are guided by economic incentives; both the need to reduce labor inputs (i.e. to reduce labour costs in the case of mixing fertilizers) and the need to reduce cash outlays (fertilizer input is delivered as credit so farmers reduce the quantity of fertilizer used and increase margins when they sell their cotton). Therefore, the current practice needs to be guided by identifying threshold level of minimum rate of fertilizer. The high yielding varieties are responding to higher levels of nitrogen, phosphorus and potassium than what is recommended today (Channabasavanna *et al.,* 1996)

Hence, this study was conducted with the following specific objectives.

To compare the adoption of nutrient management packages by SAU and FP followers

To find out relationship between profile characteristics with adoption nutrient management packages

Materials and Methods

Nalgonda district was selected purposively for the study due to following reasons. It is one of the major rice cultivating districts of the state. About 75 percent of the population of district depending on agriculture and the main commercial crop is rice. About 30.5 per cent area of the district is under the rice cultivation. The gross cropped area of the district is 4, 05,315 ha with the production of 6, 83,868 tonnes with the productivity of 3280 Kgs / ha of the crop. It is also found that there is a large variation in actual fertilizer requirement of the rice crop and fertilizer being applied by the farmers in the district. Farmers of the district are applying 1.5 to 2 time’s excess of fertilizers than the recommendation, in the form of complexes.

Three mandals were selected by stratified random sampling procedure. Five villages from each mandal were selected for the study. Six farmers from each village (3 State Agricultural University recommendation followers and 3 Farmers Practice followers) were interviewed for this study. Thus, a total of 90 farmers constituted the sample for the study. The adoption of the respondents regarding the nutrient management packages in rice, was measured by using structured

schedule for rice growers, consisting of questions which were prepared after thorough references from the recommended package of practices and discussions with experts in the respective fields is used for the study. The data were analyzed using mean and standard deviation, frequency distribution method and 'Z' test.

Results and Discussion

Adoption level of nutrient management packages by paddy farmers: It could be revealed from Table 1 that majority of the SAU followers (68.9%) and FP Followers (75.6%) had medium level of adoption of nutrient management. Whereas, 17.8 per cent SAU followers fell in high category of adoption when compared to FP Followers (8.8%). There were only 13.3 per cent of SAU followers and 15.6 per cent of FP followers, found in low category.

When sample were pooled, majority of the farmers (72.2%) fell in medium category of adoption of nutrient management practices followed by low and high (14.4% and 13.3%) category of adoption of nutrient management practices, respectively

Relationship analysis between selected traits of dairy farmers and their knowledge related to Nutrient Management practices: : It is apparent from Table 2 that there existed a positive and highly significant relationship between farmers' education, farm size, farming experience, irrigation water supply, information seeking behaviour, extension contact and capacity enhancement activities in both the areas except in age, annual income, machinery ownership, profit oriented behaviour in case of SAU followers and age, farming experience, irrigation water supply, information seeking behaviour, machinery ownership and profit oriented behaviour in case of FP followers.

From Table- 3 It was evident that calculated Z value (3.3363) was greater than the Z table value at 0.05 level of probability. So the null hypothesis was rejected and hence it could be concluded that there exists a significant difference between adoption scores of SAU and FP respondents on nutrient management packages.

There was a significant difference in adoption between SAU and FP respondents. In other words SAU respondents had low adoption and differed significantly when compared with FP respondents.

The reasons for this trend could be attributed to many reasons which include high cost of fertilizers, non-availability of the fertilizers at proper time, low profitability of the practice, lack of enough moisture in the soil, pest and disease attack, lack of knowledge on use of bio fertilizers and green manure crops, non-availability of FYM, high cost of cultivation and non-availability of labor etc.

High cost of fertilizers was the major reason in non-adoption of recommended nutrient management, majority of SAU respondent's small sized farmers with medium annual income. In this situation bearing of increased cost of fertilizers by a small farmer like SAU respondents is difficult. So the government must come forward with the fertilizer subsidies as well as crop loans in order to save the farmers from high cost of fertilizers.

High cost of cultivation and non-availability of inputs was the second most important reason on which we must have a look. As we previously discussed majority of SAU respondents small sized farmers with medium annual income, the state government, banks and the other cooperative banks must provide the crop loans to the farmers at reasonable interest, because

adoption depends not only on mental acceptance but also on availability of inputs.

Lack of moisture at right time of fertilizer application was important reason reported by the respondents for non-application of urea at proper time. This bio physical factor cannot be manipulated by any individual except other than taking up water conservation practices in the field which can minimize the problem to some extent.

Lack of knowledge on bio-fertilizer and green manure crops were the other reasons expressed by respondents for non-adoption. Hence the extension officials should arrange the on farm demonstrations for upgrading the knowledge of respondent as well as to know the worth of those practices.

Some of the other reasons which could be attributed to non-adoption include non-belief, low education, old age farmers did not believe new technology and firm on their own experience of adoption of nutrient management practices.

The high adoption in the case of FP respondents can be attributed to, respondent trust on his abilities and farming experience, and belief in them, then decide to change, test and recognize it is effective, oral transmission of new technologies among farmers through special occasion as festivals, sitting in coffee shop, climate, weather change in soil fertility, silt deposition in flooding period.

The respondent trust on his abilities and his farming experience is the major motivating factor behind FP adoption. The experience in farming helps the respondent to learn many things right from the number of ploughings to harvest and yield etc.

Generally a farmer will have knowledge about his soil and its nutrient status and amount of fertilizer to be applied to the field. So he can formulate how much fertilizers to be applied other than SAU recommendation for the zone, through his farm experience. So the respondent farming experience might be one of the reasons behind high FP adoption.

The yield difference, in comparison between SAU and FP recommendations might be also one of the reasons.

The field condition (sandy soils, chalka soils, water logging conditions) also plays major role in deciding nutrient recommendation, and might have forced the respondent to apply his own recommendation than SAU recommendation.

Table.1 Adoption level of nutrient management packages by paddy farmers

	SAU Practice (n = 45)			**Farmers Practice (n = 45)**			**Total (N = 90)**		
	L	**M**	**H**	**L**	**M**	**H**	**L**	**M**	**H**
F	6	31	8	7	34	4	13	65	12
%	13.3	68.9	17.8	15.6	75.6	8.8	14.4	72.2	13.3

Table.2 Correlation coefficients of the selected traits of the farmers with their adoption level related to nutrient management packages

S.No	Characteristics	SAU followers (r)	FP followers (r)
1	Age	-0.148NS	-0.034NS
2	Education	0.259*	0.088NS
3	Annual income	0.223*	0.237*
4	Farm size	0.039NS	0.067NS
5	Farming experience	0.052NS	0.032NS
6	Irrigation water supply	0.035NS	0.281*
7	Information seeking behaviour	0.281*	0.202*
8	Extension contact	0.290*	0.283*
9	Machinery ownership	0.050NS	0.018NS
10	Capacity enhancement activities	0.263*	0.304*
11	Profit oriented behaviour	0.279*	0.134NS

Table.3 Mean differences in adoption of nutrient management packages by paddy farmers

S. No	Respondent category	Size of the sample	Mean	S.D	'Z' value
1	**SAU**	45	78.27	8.10	3.3363*
2	**FP**	45	83.66	7.20	

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