



RESEARCH PAPER

Extent of precision in input utilization by the rice farmers in Nellore district of Andhra Pradesh

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Abstract : The present investigation was done to study the extent of precision in input utilization by the rice farmers in Nellore district of Andhra Pradesh. *Ex-post facto* research design was followed for the study and a sample of 120 respondents was drawn. In terms of utilization of seeds, only 44.33 per cent of precision was noticed for seed treatment followed by variety with 49.33 per cent and seed rate with 95.70 per cent by the rice farmers. Overall precision towards all the major fertilizers is only 57.69 per cent by the rice farmers which includes time of application, method of application and dosage of fertilizers. In terms of utilization of insecticides only 30.33 per cent of precision was noticed towards identification of ETL, followed by dosage with 55.52 per cent, followed by use of recommended chemical with 57.22 per cent and quantity of spray fluid with 59.53 per cent in insecticides utilization by the rice farmers. Regarding the utilization of fungicides, only 29.86 per cent of precision was noticed towards identification of ETL, followed by dosage with 66.99 per cent, followed by use of recommended chemical with 68.97 per cent and quantity of spray fluid with 68.97 per cent in utilization of fungicides by the rice farmers. In terms of utilization of herbicides, only 64.83 per cent was noticed towards use of recommended chemical followed by 65.41 per cent of precision in terms of dosage. Regarding the utilization of rodenticides, 62.68 per cent towards use of recommended chemical, followed by 71.64 per cent of precision in terms of dosage. Coming to the overall results, the average of precision of inputs in utilization revealed that, herbicides was found to be having high extent of precision with 65.12 per cent, followed by seeds with 63.12 per cent, rodenticides with 62.16 per cent, fungicides with 60.20 per cent, fertilizers with 57.69 per cent and insecticides with only 50.64 per cent, ranked second, third, fourth, fifth and sixth, respectively.

Key Words : Inputs, Seeds, Fertilizers, Insecticides, Fungicides, Herbicides, Rodenticides, Dosage

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INTRODUCTION

Rice is most important and extensively grown food crop in the world. Almost one-fifth of the world's population, depend on rice cultivation for their livelihoods. During the course of action, the inputs *viz.*, seeds,

fertilizers, insecticides, herbicides and rodenticides play a major role in determining the net income per unit area of rice cultivation. The utilization of inputs greatly influencing the farmers by way of their availability, quality, timely application, dosage, method of application etc. in

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rice cultivation. On the other side, heavy incidence of different pests and diseases as a result of both environmental and man-made factors forced the rice farmers to go heavy usage of pesticides in rice cultivation. Input agencies also going for inventing, innovating and popularizing crop specific and pest specific molecules. Mostly the farmers are not aware of correct types and dosage of different agro-chemicals and mixing two or three chemicals at a time leading to high cost of cultivation towards pesticides. Further, the herbicides are also gaining their importance in rice cultivation to replace man power for there are also herbicides to be applied at different stages of rice crop to completely keep the weed free rice crop. However, all these herbicides are costly and incurring high expenditure in rice cultivation. Rodenticides are also important to reduce the menace of rats in rice cultivation. Since last two decades, the consumption of fertilizers, pesticides and other inputs in rice became very high to achieve high production and productivity. But due to intensive use of inputs the cost of cultivation rose up and reduced the net returns in rice cultivation.

MATERIAL AND METHODS

The study was conducted in Nellore district of Andhra Pradesh during the year 2018-19. *Ex-post facto* research design was followed for the study. Three mandals of Nellore district and four villages from each mandal *viz.*, Mypadu, Pallipadu, Somarajupalle and Indukurpet from Indukurpeta mandal, Naidupalem, Kodavalur, Gandavaram and Talamanchi from Kodavalurmandal, Allur, Isakapalle, Beeramgunta and Velicherla from Allurmandal were selected by using simple random method from which 120 rice farmers were selected as sample. It was measured by taking six major inputs *viz.*, seed, fertilizers, insecticides, fungicides, herbicides and rodenticides been used in rice cultivation

with appropriate components. A total of three components were included to calculate the extent of precision by the rice farmers for the seed *viz.*, seed variety, seed rate, and seed treatment. A total of four components were included to calculate the extent of precision by the rice farmers for the fertilizers' *viz.*, nitrogenous fertilizers, phosphorus fertilizers, potassic fertilizers and secondary nutrients under which sub components were taken *viz.*, time of application and dosage. A total of four components were included to calculate the extent of precision by the rice farmers for the insecticides, fungicides, herbicides and rodenticides *viz.*, identification of ETL, use of recommended chemical, dosage and quantity of spray fluid.

After calculating the extent of precision of each major input, all the six major inputs were ranked based on the extent of precision.

$$\text{Extent of precision} = 100 - \frac{(\text{Recommended} - \text{Actual})}{\text{Recommended}} \times 100$$

RESULTS AND DISCUSSION

From the Table 1 it is clearly depicted that, herbicides was found to be having high extent of precision with 65.12 per cent, followed by seeds with 63.12 per cent, rodenticides with 62.16 per cent, fungicides with 60.20 per cent, fertilizers with 57.69 per cent and insecticides with only 50.64 per cent, ranked second, third, fourth, fifth and sixth, respectively.

Herbicide usage by the farmers might be under high vigilance, because of its damage to the crop under improper application, may be from the point of dosage or method of application. Further, there are only few molecules of herbicides for rice to be applied under different stages of the crop. By having the awareness on the ill effects of herbicide misuse, the farmer might have gone for high precision in use of herbicides. Further, in the use of non-selective herbicides like glyphosate,

Table 1 : Ranking of six major inputs based on extent of precision

Sr. No.	Type of input	Extent of precision (%)	Rank
1.	Seeds	63.12	II
2.	Fertilizers	57.69	V
3.	Insecticides	50.64	VI
4.	Fungicides	60.20	IV
5.	Herbicides	65.12	I
6.	Rodenticides	62.16	III
7.	Total average of extent of precision in input utilization	59.82	

farmers might be going for higher doses as well as improper method of application leading to low precision.

Being more popular and high market rate fetching varieties BPT 5204 and RNR 15048 were under high usage among all the rice farmers. Even though the varieties are not recommended to the district, because of high susceptibility to the predominant diseases/pests in the district *viz.*, blast, brown plant hopper and leaf folder. The farmers might be preferring for its high grain quality and market demand. Due to non-significant visual evidence among the rice farmers towards seed treatment, the farmers might be neglecting the operation leading to low precision.

Intelligence of rats is the prime cause for poor precision in rodenticides. Farmers might be applying different chemicals to control rats but the method of application might have been a source of signal for the rats through which they are escaping from the farmers. Indirectly the efforts made by the farmers towards rat control were not fully realised leading to low precision. Further, the severity of the problem as well as the repetition of the same practices several times might have constituted for low precision.

Regarding fungicides, farmers might be having limited options of molecules due to limited number of (2-3) major diseases for which specific fungicides are available in the market. But in the recent past, the gravity of incidence of diseases is becoming very severe leading to huge damage to rice crop at different stages of crop growth. Especially, the rice diseases like rice blast, sheath blight, sheath rot, brown spot and bacterial leaf blight cause severe damage if timely spraying is not adopted in rice crop, which leads to low precision. Further, the environment has direct effect on incidence of diseases, which has not been properly monitored by the farmers. Identification of ETL as well as pace of further damage might be a different task for the rice farmers due to lack of technicality as well as sharp observation on the growth of organism. Use of higher dosage, faulty method of application, mixing of 2-3 chemicals also might be contributing for low precision.

The concept of “seeing is believing” had a great impact on over adoption of fertilizers in rice cultivation. Even though there are zonal level recommendations as well as soil test based recommendations prescribed by the extension functionaries, the farmers might be so tempted to apply higher doses of fertilizers as well as untimely application of fertilizers leading to huge

investment and low precision. Heavy usage of complex fertilizers as basal application and top dressing (2-3 times) led to over doses of phosphorus as well as increased investment. Similarly, application of nitrogen in form of urea in higher quantities as well as under high water level might have led to more wastage through leaching and evaporation. All these factors in directly increased the dosage of fertilizers and decreased the precision also. This also had the problem of severe incidence of pests and diseases.

Day by day, the incidence of insects and their gravity of damage is increasing in rice cultivation due to several environmental and induced factors. All these factors one way or the other, are forcing the farmer to go for insecticidal sprays at frequent intervals, which might have led to low precision. In this juncture, farmers were exposed to a situation where in, they have multiple number of options *viz.*, choosing right chemicals, desired brand, mixing of 2-3 chemicals, dosage, method of application etc. All these options are diverting the farmers towards taking defensive decision of investing huge expenditure, which led to low precision. In the course of time, due to lack of awareness and knowledge, over enthusiasm of controlling the insect, the farmers might be neglecting the ETL which is the prerequisite for taking a decision of insecticidal sprays, which also led to low precision.

The possible reason for the low precision can be attributed to imitation of fellow farmers, lack of technical know-how and exploitation by input dealers, assumption of heavy application of inputs leading to high productivity etc. About sixty per cent of precision in input utilization in rice clearly indicates the need for filling the gaps of forty per cent which may include the practices like seed treatment, application of right fertilizers at right time, judicious use of insecticides and fungicides both in dosage and method of application. Similar work related to the present investigation was also carried out by Alipour *et al.* (2012); Ibekwe *et al.* (2012); Mesike *et al.* (2009); Oluyole *et al.* (2013); Rajakumar (2013); Shende and Bagde (2013) and Udaykumar *et al.* (2010).

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