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EFFECT OF SLOW RELEASE NITROGENOUS SOURCES ON GROWTH AND YIELD OF RICE, VARIETY: JAYA

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The importance of nitrogen nutrition in rice has been brought out by many experiments conducted in India and abroad. However the effectiveness of applied nitrogen depends on many factors and the use of slow release nitrogen sources is a method to increase its efficiency, Field experiments conducted at various agro-ecological conditions to compare different slow release nitrogen fertilizers against untreated nitrogen fertilizers have proved the importance of the former in reducing nitrogen losses and subsequent increase in the grain yield in rice (Rajendra Prasad *et al.*, 1970; Patil, 1972; Venkat Reddy and Freeman, 1973; Freeman *et al.*, 1974; and Rajale and Prasad, 1975). However experimental evidence in this line is very meagre as far as our state is concerned. Therefore an experiment was conducted in order to study the relative merits of different slow release nitrogen sources and nitrification inhibitors on growth and yield of rice variety Jaya.

Materials and Methods

The experiment was conducted in block 1 of Model Agronomic Research Station, Karamana during the second crop season of 1975 — 1976. The soil belonged to sandy clay loam and contained 0.085 per cent total nitrogen, 0.0025 per cent available P_2O_5 and p.026 per cent available K_2O, with a pH of 5.3. The treatment consisted of six sources of nitrogen namely urea (S_1), sulphur coated urea (S_2), shellac coated urea (S_3), IBDU (S_4), neem cake blended urea (S_5), and AM treated urea (S_6). The experiment was conducted in randomised block design replicated three times. The recommended fertiliser dose of 90:45:45 was given. The regular package of practices were followed. Observations were recorded on height of plants, productive tillers, weight of panicle, number of spikelets per panicle, percentage of filled grains per panicle, weight of 1000 grains, yield of grain and yield of straw. Observations recorded were statistically analysed and the results are given here under.

Results and Discussion

The results on various characters studied are given in Table 1. Results showed that the different slow release nitrogen sources did not show any significant influence in increasing the height of plants. But they exhibited significant influence in increasing the percentage of productive tillers. Highest percentage

Table 1

Growth and yield of rice as influenced by various slow release nitrogen sources

Treatments	Height of Plant at harvest cm	Percentage of productive tillers	Weight of panicle gm	Number of spikelets per panicle	Weight of 1000 grains gm	Yield of grain Kg/ha	Yield of straw Kg/ha
S_1	75.77	63.24	1.53	75.33	28.00	2688	3839
S_2	73.14	66.13	1.76	91.70	29.72	3712	4229
S_3	78.59	61.97	1.70	88.55	29.53	3674	4239
S_4	75.33	66.28	1.61	82.37	29.10	3402	3920
S_5	75.81	73.12	1.81	89.07	30.49	4296	4530
S_6	78.91	67.04	1.82	96.85	31.61	4687	4968
'F'test	N. S.	Sig	Sig	Sig	Sig	Sig	Sig
C.D(0.05)	8.173	5.338	0.0642	1.794	0.699	199.219	353.70

of productive tillers was recorded in neem cake blended urea treated plots. The other slow release nitrogen sources and the untreated urea were on par. The increase in percentage of productive tillers due to application of neem cake blended urea has been shown earlier by Bains *et al.*, (1971).

In the case of weight of panicle there was significant difference due to the effect of slow release nitrogen sources. All the slow release nitrogen sources were superior to untreated urea and the maximum was recorded by AM treated urea. This may be due to the inhibiting effect of AM on the nitrification process of AM treated urea which resulted in the extension of availability of nitrogen through out the growing period of the plant. In the case of neem cake blended urea also the nitrogen was made available to the plant throughout the growing season resulting in increased panicle weight. Similar results have already been obtained by AICRIP (1975).

The different slow release nitrogen sources produced significant differences in the number of spikelets per panicle. AM treated urea produced the maximum number of spikelets per panicle followed by sulphur coated urea and neem

cake blended urea which were on par. The untreated urea gave the minimum number of spikelets psr panicle showing that all the slow release nitrogen sources were superior to untreated urea. The reason for getting less number of spikelets per panicle ia untreated urea can be attributed to the earlier utilisation of applied nitrogen for tiller production and vegetative growth making only a decreased share of nitrogen available for grain production at the later stages. AM is capable of retarding the nitrification of ammonia into the leachable nitrate form and thereby reduces the losses of nitrogen. Sulphur coated urea and neem cake blended urea have also behaved like this resulting in increased availability of nitrogen tor a longer period.

Effects of slow release nitrogen sources were significant in increasing the 1000 grain weight. AM treated urea gave the highest 1000 grain weight followed by neem cake blended urea. Sulphur coated urea, shellac coated urea and IBDU were on par. It is but natural to record the lowest 1000 grain weight by untreated urea probably because of the lower levels of nitrogen in the soil on account of earlier utilisation, more leaching and other losses. Similar results were earlier reported by Arunachalam *et al.*, 1974.

On a perusal of the data it is clear that slow release nitrogen sources were highly effective in increasing the yield. Maximum yield was obtained from AM treated urea followed by neem cake blended urea, sulphur coated urea and shellac coated urea. Sulphur coated urea and shellac coated urea were on par and were significantly superior to IBDU. Untreated urea recorded the lowest yield. The significant positive effects of slow release nitrogen sources on the yield components like number of productive tillers, number of spikelets per panicle, weight of panicle and 1000 grain weight clearly bring out the reasons for the increase in the yield of grain.

The yield of straw is also influenced significantly due to different slow release nitrogen sources. AM treated urea produced the highest straw yield followed by neem cake blended urea, sulphur coated urea and shellac coated urea. By providing a steady supply of nitrogen throughout the growing season the slow release nitrogen sources might have influenced the plants in producing more vegetative growth which resulted in increased straw yield.

Summary

An investigation was carried out at the Model Agronomic Research Station, Karamana during the second crop season 1975 to study the comparative efficiency of different slow release nitrogen sources on growth, yield and yield contributing attributes of rice variety Jaya. All the slow release nitrogen sources were superior to ordinary untreated urea. Highest percentage of productive tillers was recorded by neem cake blended urea followed by AM treated

urea. The weight of panicle was maximum in AM treated urea followed by neem cake blended urea. AM treated urea also gave the highest number of spikelets per panicle. Thousand grain weight, yield of grain and straw were maximum in AM treated urea followed by neem cake blended urea. AM treated urea gave an average yield of 4687kg/ha followed by neem cake blended urea which gave 4296kg/ha. The minimum grain yield of 2688kg/ha was given by untreated urea.

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ffl08*l<ft>ro6m സ്വഭാവത്തോടുകൂടിയ നൈട്രജൻ രാസവളങ്ങളും ഉപയോഗിച്ച് 1975 ഖരീഫ് വിളവുകാലത്തു് കരമന നെല്ലുഗവേഷണ കേന്ദ്രത്തിൽ നടത്തിയ ഒരു പരീക്ഷണത്തിൽ മേൽപറഞ്ഞതരം roocruojgRSBOo (മന്ദീകരണ സ്വഭാവത്തോടുകൂടിയവ) സാധാരണ യൂറിയയേ അപേക്ഷിച്ചു് മെച്ചപ്പെട്ടവയാണന്നു് കണ്ടു. പ്രയോജനകരങ്ങളായ ചെനപ്പുകളുടെ എണ്ണം ഏറ്റവും കൂടുതൽ ലഭിച്ചതു് വേപ്പിൻ പിണ്ണാക്കും, എ. എമ്മും കലർത്തിയ യൂറിയ ഉപയോഗിച്ച നിലങ്ങളിലായിരുന്നു. കതിർ കലയുടെ തൂക്കം, നെൻമണികളുടെ എണ്ണം, നെൻമണികളുടെ തൂക്കം, മൊത്തത്തിലുള്ള fflcnts^culgrij", വൈയ്ക്കോൽ ഉൽപാദനം എന്നിവ ഏറ്റവും കൂടുതൽ ലഭിച്ചതും എ. എം കലർത്തിയ യൂറിയ ചേർന്ന നിലത്തിൽ നിന്നായിരുന്നു. രണ്ടാം സ്ഥാനം വേപ്പിൻ പിണ്ണാക്കു് കലർത്തിയ യൂറിയ ചേർത്ത നിലത്തിലുമായിരുന്നു. എ. എം കലർത്തിയ യൂറിയ ചേർത്തപ്പോഴ ffl«rr(i) ശരാശരി വിളവു് ഹെക്കറിനു് 4687 കി. ഗ്രാം നെല്ലും വേപ്പിൻ പിണ്ണാക്കു് കലർത്തിയ യൂറിയ ചേർത്തപ്പോഴും 4296 കി. ഗ്രാം നെല്ലും സാധാരണ യൂറിയ ചേർത്ത നിലത്തിൽ 2688 കി. ഗ്രാം നെല്ലും ആണു് ലഭിച്ചതു്.

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