Agri. Res. J. Kerala, 1975, 13 (2) 128—131

A COMPARATIVE STUDY OF SOIL AND FOLIAR APPLICATION OF UREA ON SESAMUM

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In the southern sandy coastal area of Kerala, after two successive crops of rice, sesamum is grown extensively in rice fields during January to April. The period being summer with little or no rainfall the crop experiences more or less a droughty condition. It has been reported that foliar application of urea is more effective than soil application in increasing crop yields under adverse enviornmental conditions such as water logging, moisture stress etc. (Khara and Misra, 1970). A preliminary study was, therefore, undertaken at the Oil Seed Research Station. Kayamkulam to find out the cmoparative merits of soil and foliar application of urea on sesamum.

Materials and Methods

The experiment was laid out in randomised block design with 4 replications, An NPK schedule of 15, 15, 30 kg per hectare was followed. The treatments were: (I) entire quantity (15 kg N/ ha) as basal application (2) half the quantity as basal and half as top dressing 20 days after sowing; (3) half the quantity as basal and half as foliar spray 20 days after sowing: (4) entire quantity as top dressing 20 days after sowing; (5) entire quantity as foliar spary 20 days after sowing and (6) sparying water 20 days after sowing. The entire quantity of phosphorus and potassium was applied at the lime of last ploughing along with nitrogen wherever it was applied as basal dressing as per the treatments. Seeds were dibbled at a spacing of 15 × 15 cm in sub plots 5 × 5 m. Seedlings were thinned on the fifth day after sowing so as to retain. two seedlings per hole. Two intercultivations as practiced locally were done on 15th and 25th day after sowing. The required quantity of urea as per the treatments was dissolved in a fixed volume of water (2.5 1. per polt) irrespective of the quantity of urea and sprayed by means of a high volume sprayer. The strength of the urea solution worked out to be 3.28 per cent in the treatment where the entire quantity of urea was applied as foliar spray and 1 .64 per cent where half the quantity was given through foliage,

The soil is sandy loam having a pH of 5 . 9, low in nitrogen and potassium and medium in phosphorus.

Results and Discussion

Leaf scorching was noticed when the entire quautity of urea was applied as foliar spray. The yield data obtained are presented in Table- 1. Maximum yield was recorded in both the years when half the quantity of urea was given as bassal dressing and the other half through foliage and the increase in average yield observed over the other treatments was statistically significant. The treatment which received the entire dose of urea as foliar spray always recorded the lowest yield. Top dressing (soil application) the entire qnantity consistently gave higher yields than all other treatments except treatment 3.

The experiment revealed that for sesamum crop application of 15 kg nitrogen/ha in the form of urea in two equal splits' through soil as bassal dressing

Table 1

Yield of sesamum treated with urea under different methods of application

Treatments	Yield in kg/ha 1971*	1972*	Mean*
1. Entire dose as basal (S.)il application)	239.5	20S.O	223.75
2. Half dose as basal + half dose as lop dressing (Soil application)	229.0	227.4	228.20
3. Half dose as basal + half as foliar spray	284.4	296.7	290.55
4. Entire dose as top dressing (Soil application)	268.1	247.2	257.65
5. Entire dose as foliar spray	122.7	105.6	114.15
6. Spraving water (control)	223 5	200.6	212 05
*Significant at 1% level			
CD	42.88	63.21	24.40

ind through foliage 20 days after sowing is beneficial from the point of yield inder the conditions prevailing in the sanday coastal areas of Kerala. This is nore or less in agreement with the findings of Sahu et *al* (1971) that foliar ipplication of half the dose of nitrogen preceeded by the application of the •emaining dose through soil is capable of giving higher yields and better profits rrespective of the levels of nitrogen as compared to its soil application in kharif

season sesamum grown under rainfed condition. An examination of the yield data shows that the yield was consistently less when urea was applied through either as basal dressing or in two equal split doses one as basal and the other as top dressing than that recorded when the entire quantity was top dressed 20 days after sowing. In the case of basal application part of the added nitrogen might have been utilised by the weeds before their removal by intercultivation and part lost by volatalisation resultnig in its reduced availability at the later stages of crop growth and consequent reduction in yield. Top dressing was done 20 days after sowing and this more or less synchronised with the onset of reproductive phase as the sesamum started flowering from 30 th day after sowing. The comparatively high yield obtained when the entire quantity was top dressed, therefore, suggests that availability of nitrogen at this stage is crucial in influencing the yield of sesamum. The reduction in yield observed when the entire quantity of urea was applied through foliage might be due to the physical injury caused to the plants by leaf scorching. Gaur (1969) reported leaf scorching at all stages when concentrations higher than 2 per cent urea were applied on sesamum. Leaf scorching noticed when the entire quantity of urea was applied as foliar spray, therefore, appears to be due to the higher concentration (3.28 *psr* cent) of the solution as compared to the strength (1 . 64 per cent) when half the quantity was applied through foliage.

Summary

An experiment to study the comparative effect of soil and foliar application of urea on yield of sesamum was conducted at the Oil Seed Research Station, Kayamkulam during 1971 - 72,

Application of half the quantity of urea as basal and half the quantity through foliage 20 days after sowing has been found to be beneficial in increasing yield of sesamum.

Spraying 3 . 28 per cent urea 20 days after sowing has been observed to cause leaf scorching which reduced the yield considerably.

സംഗ്രഹം

പാകൃജനക വളപ്രയോഗ രീതി എള്ളത്പാദനത്തെ എങ്ങനെ finjou/laacrra എന്നു പഠിക്കുവാൻ കായംകുളത്തെ എണ്ണക്കുരു ഗവേഷണ കേന്ദ്രത്തിൽ 1971 ലും 1972 ലും ഓരോ പഠനം നടത്തുകയുണ്ടായി. ഹെക്ടറിന് 15 കി. ഗ്രാം പാകൃജനകം ലഭിക്കത്തക്കവിധത്തിൽ യൂറിയാ താഴെ വിവരിക്കുന്നരീതിയിൽ ഉപയോഗിച്ചു: 1. വിതക്കുന്നതിനുമുമ്പ് മുഴുവനും അടിവളമായും: 2. പകുതിഅടിവളമായും ബാക്കിപകുതി വിതച്ചു് 20 ാം ദിവസം മേൽ

വളമായും; 3, പകുതിഅടിവളമായും ബാക്കിപകുതി വിതച്ചു് 20-ാം ദിവസം ഇലകളിൽ തളിച്ചും 4. വിതച്ചു് 20-ാം ദിവസം മുഴവനും മേൽവളമായും: 5. വിതച്ചു് 20-ാം ദിവസം മുഴവനും ഇലകളിൽ തളിച്ചും.

ഇതിൽ, മൂന്നാമത്തെ രീതിയിലുള്ള വള പരിക്രമത്തിലാണു് ഏറ്റവും അധികം വിളവു് ലഭിച്ചതു്. യൂറിയാ 3. 28 %വീര്യത്തിൽ ഇലകളിൽ തളിക്കുമ്പോഴും ഇലകളും കരിയുന്നതായും വിളവു് തീരെ കുറയുന്നതായും അനുഭവപ്പെട്ടു.

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(M. S. *received:* 10-2-1975)