EFFECT OF IRRIGATION AND NITROGEN ON THE YIELD OF SEASAME (GINGELLY)

By

H.B. Nayakekorala, Research Officer R.R.S., M.I.

INTRODUCTION:

As literature suggests, sesame is a crop that prefers to grow on relatively dry, light and well drained soils. However when grown in yala season as a rainfed crop, it may be subjected to soil moisture stress at certain growth stages depending on the rainfall distribution. The flowering and pod filling stages are said to be sensitive to soil moisture stress when grown as a rainfed crop during yala season. Chances for these stages to experience a soil moisture stress are more. An experiment was conducted to find out the effect of irrigation after flowering when there is a soil moisture stress on the yield of sesame. Three levels of N were also included in the experiment to see whether N use efficiency could be increased by introducing irrigation. Results of this experiment are reported below.

Materials and Methods:

The experiment was carried out at the Agricultural Research Station, Maha Illuppallama during Yala 1982. The experimental site was a highland, of Reddish Brown Earth (well drained).

Three irrigation treatments as main treatments and three nitrogen levels as sub treatments were laid down in a split plot design replicated four times.

Irrigation treatments were ;

T_1 - No irrigation (fully rainfed)

T_2 - Irrigation at 2 week intervals.

T_3 - Irrigation at Weekly intervals.

Nitrogen treatments were ;

No - No nitrogen.

N_1 - 20 Kg N/Ha.

N_2 - 40 Kg N/Ha.

Size at main plot was 18X10 M while that of sub plot was 10X6M. Seeds (MI-3) were sown on the 21st of April 1982 in broad-base furrows of 1 M wide in order to facilitate irrigation. The spacing was 30X5 cm. Basal fertilizer was applied at the rate of 126 Kg Super phosphate and 63 Kg muriate of potash per hectare. Nitorgen was top dressed one month after sowing. Irrigation was started after flowering. At each irrigation 1 inch of water was applied. T_2 treatment received two irrigations. While T_3 treatment received three irrigations. The crop was harvested on the 9th of July.

Results and discussion:

Fig.1 shows the rainfall distribution during the crop growing period. The distribution was satisfactory till the 6th or 7th week after sowing. However, there were no sufficient rains afterwards. Irrigation treatments were introduced during this period as shown in fig.1.

Grain yield of sesame under different treatments are given in table 1. Yield differences due to different N levels under rainfed conditions are not statistically significant. This suggests that the application of N has no use if there going to be a dry period after flowering. However, response to applied N by the crop could be seen when the crop was irrigated. The response to different irrigation treatments had been different. It is seen that significant yield increase could be obtained by higher dose of N when 2 irrigations are made at bi-weekly intervals. On the other hand with three irrigations applied at weekly intervals, the same yield could be obtained but with low nitrogen level.

Nitorgen use efficiency (expressed in Kg. of sesame produced/Ha/Kg N applied) under three irrigation treatments are given below :-

	Nitrogen level.	
	20 Kg/Ha	40 Kg/Ha
Rainfed	27.6	13.7
2 Irrigations (Bi-weekly)	32.4	19.5
3 Irrigations (Weekly)	35.1	18.9

It is seen that the lowest efficiency is recorded for 40 Kg N/Ha under rainfed treatment. The highest value is reported for 20 Kg N/Ha under 3 irrigations given weekly intervals. This suggest that there must be sufficient soil moisture in order to utilize applied N efficiency by the crop.

It can be concluded from the results of this experiment the yields of sesame is reduced due to shortage of soil moisture during the period after flowering. Two or three irrigations made during this period significantly increase the yields. For efficient use of N there must be sufficient soil moisture during this period.

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Table 1: GRAIN YIELD - SESAME, YALA 1982 (Kg/Ha)

IRRIGATION TREATMENTS	N LEVELS (Kg/Ha)			
	0	20	40	$LSD_{.05}$
NO IRRIGATION	505	552	547	57
2 IRRIGATIONS (BI-WEEKLY)	647	648	767	
3 IRRIGATIONS (WEEKLY)	617	702	757	
$LSD_{.05}$	119.5			

CV(a) 18.3%

CV(b) 10.4%

Fig.1. RAINFALL DISTRIBUTION AFTER SOWING OF SESAME, YALA - 1982