

Rotation Experiment with Sesamum

BY

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ABSTRACT

An experiment conducted to find out the most suitable and remunerative crop rotation involving the *Sesamum* crop indicates that adopting rotational cropping fetches higher yield from *Sesamum* than by cropping it repeatedly. *Sesamum* responds better when rotated with groundnut than with *Cholam* or *Cumbu*. Crop rotation fetches high yield and maximum economic returns. Contrary to the popular belief *Sesamum* crop does not depress the yield of the succeeding crop be it a cereal or legume but increases their yield.

INTRODUCTION

In and around Karur, *Sesamum* is cultivated in single crop dry land in a two-year rotation with groundnut, *Cholam* or *Cumbu*. To find out which of the crops commonly cultivated in the area can be rotated with *Sesamum* to the maximum advantage of the cultivator, an investigation was taken up at the Gingelly Research Station, Karur.

MATERIALS AND METHODS

The experiment was conducted for four years from 1962 to 1965 using the local varieties in all the crops. The treatments were (i) *Sesamum* followed by *Sesamum*; (ii) *Sesamum* followed by *Cholam*; (iii) *Sesamum* followed by

Cumbu; (iv) *Sesamum* followed by groundnut; (v) *Sesamum* in the first season of the year followed by horsegram in the second season of the same year; (vi) *Cholam* followed by *Sesamum* (vii) *Cumbu* followed by *Sesamum* and (viii) groundnut followed by *Sesamum*.

The design of layout was simple randomized block with four replications. Spacings of 22.5 cm eitherway and 30 cm eitherway for groundnut and other crops were adopted respectively. Trials were conducted during the monsoon season under rainfed conditions.

RESULTS AND DISCUSSION

The yield data of the *Sesamum* crop alone are presented in Table 1. Yield differences between different

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TABLE 1. Yield of *Sesamum* in different rotations

Treatments	Yield in kg/ha					Increase on control (per cent)
	1962	1963	1964	1965	Mean	
<i>Sesamum</i> <i>Sesamum</i> [Control]	138.3	34.3	102.8	142.0	93.0	100.0
<i>Sesamum</i> <i>Cholam</i>	105.7	57.9	125.3	144.8	109.3	117.5
<i>Sesamum</i> <i>Cumbu</i>	122.8	64.5	143.6	153.8	120.8	127.6
<i>Sesamum</i> <i>Groundnut</i>	122.0	68.9	133.0	173.0	124.9	134.2
<i>Sesamum</i> <i>Horsegram</i>	138.3	52.2	117.1	170.5	113.4	121.9
S. E.	...	6.7	5.2	6.8	1.1	
C. D.	...	19.3	16.2	21.4	3.9	

TABLE 2. Trend in the yield of crops (kg/ha)

Rotation		First year	Second year	Third year	Fourth year
First and third year	Second and fourth year	year	year	year	year
<i>Sesamum</i>	<i>Sesamum</i>	138.3	34.3	102.8	142.0
<i>Sesamum</i>	<i>Cholam</i> <i>Cumbu</i>	105.7	259.9	125.3	273.8
<i>Sesamum</i>		122.8	253.4	143.6	243.2
<i>Sesamum</i>	<i>Groundnut</i>	122.0	1060.0	133.0	942.7
<i>Sesamum</i>	<i>Sesamum</i> (First season)	138.3	52.2	117.1	170.5
(First season)	<i>Horsegram</i> (Second season) <i>Horsegram</i> (Second season)	Failed	35.9	50.6	115.9
<i>Cholam</i>	<i>Sesamum</i>	..	57.9	230.1	144.8
<i>Cumbu</i>	<i>Sesamum</i>	210.1	64.5	239.5	153.8
<i>Groundnut</i>	<i>Sesamum</i>	892.7	68.9	1168.5	173.0

ROTATION EXPERIMENT WITH SESAMUM

TABLE 3. Economics of rotations

Rotation	Value of produce from third year	Value of produce from the fourth year	Total value for each rotation
<i>Sesamum</i> - <i>Sesamum</i>	165	227	392
<i>Sesamum</i> - <i>Cholam</i>	200	219	419
<i>Sesamum</i> - <i>Cumbu</i>	230	158	388
<i>Sesamum</i> - Groundnut	213	849	1062
<i>Sesamum</i> - horsegram	207	320	527
<i>Cholam</i> - <i>Sesamum</i>	184	232	416
<i>Cumbu</i> - <i>Sesamum</i>	156	246	402
Groundnut - <i>Sesamum</i>	1052	277	1329

Note : Price of commodities per kg : *Sesamum* - Rs. 1.60, *Cholam* - Re. 0.80, *Cumbu* - Re. 0.65, Groundnut - Re. 0.90, Redgram - Re. 0.80 and Horsegram - Re. 0.40.

rotations attained the level of significance in all the years except first year.

Sesamum in the *Sesamum*-groundnut rotation registered the highest yield over the four years of the trial and was superior to the other four crop sequences.

To study the trends in the yield of different crops in the various rotations and their effect on one another, data have been gathered and are presented in Table 2.

The yield of *Sesamum* increased appreciably when it succeeded another

crop of millet or groundnut and the increase was also uniform. It may also be noted that no crop, especially the millets suffered a reduction in yield when sown in rotation with *Sesamum*. Though continuous cropping of *Sesamum* was not observed to reduce the yield of *Sesamum*, rotating this crop with groundnut helped to secure a maximum yield of 173 kg/ha.

The economics of the various treatments were worked out on the basis of the prevailing market rates in 1965 and are given in Table 3.

As there were failures of crops in the first year of the experiment econo-

mics for the third and fourth year have been worked out. The highest return of Rs. 1329 / ha was obtained from the groundnut-*Sesamum* rotation and the next best was from *Sesamum*-groundnut fetching Rs. 1062/-, the receipt from the other treatments being far lower. The above mentioned two treatments which fetched high returns are in effect one and the same since *Sesamum* and groundnut are raised alternately in a two-year rotation.

† The yield data presented in Table 2 demonstrate the merits of crop rotations. *Sesamum* rotated with another crop, preferably a legume like groundnut or horsegram, registered higher yield than *Sesamum* raised successively. An intervening horsegram crop during 1963 and 1964 resulted in the yield of *Sesamum* going up from 52.2 to 170.5 kg / ha. Similarly an intervening groundnut crop also accounted for an increase in the yield of *Sesamum* which rose from 122 to 133 kg / ha in the case of *Sesamum*-groundnut rotation and from 68.9 to 173.0 kg / ha in the case of groundnut - *Sesamum* rotation. This trend is mainly due to the advantage of introducing legume in crop rotations. Legumes supply nitrogen required by other crops (Kalamkar, 1950). Judicious inclusion of legumes like cluster bean in crop rotations is desirable for maintenance of soil ferti-

lity (Mirchandani and Khan, 1953). As regards the effect of crops in various rotations on each other, it is noteworthy that *Sesamum* crop did not depress the yield of the succeeding crop unlike as popularly believed but on the contrary these crops registered some increases. The groundnut-*Sesamum* rotation not only fetched the highest yield of 173 kg / ha from a *Sesamum* crop but the yield of groundnut in such a rotation also reached a maximum of 1168 kg / ha. These two oilseed crops have behaved in a manner mutually helpful to each other. The increased yield recorded by *Sesamum* in this rotation is to be anticipated, since the groundnut crop is very valuable in any crop rotation for the role it plays in fetching enhanced yield from crops rotated with it (Seshadri *et al.*, 1955).

Horsegram also is noticed in this experiment to increase the yield of *Sesamum* thereby stressing the importance of legume in any crop rotation. This trend is in conformity with the one reported by Balasubramanian (1947) who recommended horsegram for the Kovilpatti tract for rotational purposes in preference to groundnut on considerations of timely seasonal rains there. The economics of the various rotations indicate that the rotation of *Sesamum* and groundnut is the best. The receipt from these rotations ranged between Rs. 1062/- and

Rs. 1329/- which is three fold of that from "Sesamum-Cholam", "Sesamum-Cumbu" or "Sesamum - followed by Sesamum".

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