

## Groundnut Irrigation Experiment

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**Introduction:** Groundnut, which occupies nearly two million acres in this State is mostly raised as a rainfed crop in drylands. It is also raised as an irrigated crop in the summer season over an area of 1.5 lakhs of acres in the districts of South Arcot, Madurai and Tiruchirapalli. This latter cropping is important in many respects. Firstly the yields obtained are high, being on an average two to three times the yield obtained in the rainfed season. Secondly irrigated produce has about 2 percent more oil and is very valuable in the crushing industry. Thirdly the produce comes to the market in about July-August when the stocks of the earlier crop are almost exhausted and therefore the produce fetches a high price. Consequently the area under irrigated cropping is showing signs of increase. The improved irrigation facilities resulting from various ameliorative schemes have resulted in intensifying the cultivation of summer groundnut.

One notable achievement in this direction is the provision of irrigation from filter points in the wetlands as in Tanjore district, which has stimulated the cultivation of commercial crops in the rice fallows during the off-season. Groundnut and cotton are the only two commercial crops popular with the ryots and selection of a particular crop depends on the soil type. Cotton is exclusively raised in stiff clayey soils while groundnut is favoured in more open-textured soils. Even in this case the spreading type is selected in the loamy soils of the new delta area of Pattukkottai taluk. Irrigation is made cheap and effective from small wells temporarily excavated. In the clayey soils, the short-duration bunch type is preferred on account of its ease of harvest and also because fewer irrigations required. This is a step in the right direction as the production of these commercial crops is increased without encroaching on the area sown to food crops. The rice areas have a commercial crop to enrich the cultivators and the new rotational practice is also a beneficial one.

Nearly 50 percent of the area sown to irrigated groundnut is found in the taluks of Villupuram and Cuddalore in the South Arcot District. The crop is mostly raised in garden lands between

February and July. The crop receives about 12 to 16 irrigations and yields up to 5000 lb. of pods are obtained by judicious manuring with artificials. The number and frequency of irrigations decide the yield as well as the economics of cultivation. Since precise information on these aspects were not available, an experiment was conducted for the purpose and the results are presented in this paper.

**Review of literature:** At the Agricultural Research Station, Siruguppa (1941-'43) experiments conducted to determine the duty of water for different crops showed that it was 156 acres for groundnut (A. H. 45-H. G. 1) in black cotton soils. Naturally this figure varies for different tracts as it depends on the soil type, climatic conditions, etc. The most important aspect of irrigation is the economics of cultivation and investigation on this does not appear to have been conducted anywhere.

**Materials and methods:** The experiment was carried out at the Agricultural Research Station, Palur. The soil of the station is deep, red, sandy loam typical of the area sown to irrigated groundnuts in the district. The following four treatments were adopted:—

- (A) Irrigation every 10th day.
- (B) Irrigation every 15th day.
- (C) Irrigation every 20th day.
- (D) Irrigation every 25th day.

The irrigations were given from the day of first flowering which is about 24 or 25 days from sowing. Prior to this, one irrigation was given for sowing and the second, life irrigation was given on the 4th or 5th day. The layout adopted was randomised blocks, replicated six times. A 1½ feet-wide bund separated each plot and the gross plot size was 28' x 12' in 1952 and 36' x 10' in 1953 while the net plot size was 24' x 10' in 1952 and 32' x 8' in 1953 after rejecting border rows all round. The irrigations were given as per schedule and they were copious being about 2 acre-inches each time. TMV 4 strain of spreading type of groundnut which is recommended for irrigated cropping in the tract, was selected and sowing done to a spacing of 1' x 1'. Intercultivation, harvest, etc., were attended to as usual.

**Results:** The statistical analysis of the yield data and the economics of the treatments were worked out in both the years and the results are presented in the following tables.

TABLE I.

Groundnut—Irrigation Experiment—Yield data.

Treatment	1952 Summer			1953 Summer		
	Acre yield in lb.	Percentage on control	Whether significant or not (P=0.05)	Acre yield in lb.	Percentage on control	Whether significant or not (P=0.05)
(A) Irrigating every 10th day	1843	100.0	Yes	1669	100.0	Yes
(B) Irrigating every 15th day	1725	93.6		946	56.7	
(C) Irrigating every 20th day	1302	70.6		456	27.3	
(D) Irrigating every 25th day	1314	71.3		307	18.4	
Standard error	94.5	5.1		163.7	9.8	
Critical difference	284.0	15.4		493.0	29.5	

Conclusion:—  $\overline{A, B, D, C}$   $\overline{A, B, C, D}$ 

TABLE II.

Economics of the different treatments.

Treatments	No. of irrigations given	Cost of cultivation Rs.	Acre yield in lb.		Gross receipt Rs.	Profit or loss Rs.
			Pods	Haulms		
1952 Summer						
A Irrigating every 10th day	15	165	1843	3000	373	208 (Profit)
B " " 15th day	11	153	1725	2200	349	196 "
C " " 20th day	9	141	1302	1500	263	122 "
D " " 25th day	7	135	1314	1600	266	131 "
1953 Summer						
A Irrigating every 10th day	14	197	1669	3500	424	227 "
B " " 15th day	10	174	946	3400	241	67 "
C " " 20th day	9	164	456	2200	118	46 (Loss)
D " " 25th day	7	154	307	2000	81	73 "

(Note:— 1. Cost of irrigating an acre once is taken as Rs. 3/-.  
2. Pods valued at 5 lb. per rupee and vines at 500 lb. per rupee during 1952 and 4 lb. for rupee and vines 500 lb. per rupee during 1953 summer).

**Discussion:** The statistical analyses of the yield data were carried out and the yield differences attained the level of significance in both the years. Highest yield was obtained in both the years in the treatment 'Irrigating every 10th day' and there was progressive decline in yield as the interval increased

The first year, i. e., 1952 was characterised by favourable distribution of rainfall (7.01" on 19 rainy days) and the temperatures were normal. But in the second year though the rainfall was more, (7.83 inches on 10 rainy days) it was received mostly towards the latter half of the crop life. The summer was severe and the season was altogether not very congenial for crop growth. This resulted in great reduction in yield as the interval between successive irrigations increased. Treatments (C) and (D) gave only 27.3% and 18.4% of the yield under treatment (A). It is clear that in a normal year there is not much difference between the first two treatments, but in a bad year even irrigating every 15th day has reduced the yields to half, showing the need for frequent irrigations.

The economics of the different treatments reveal that maximum out-turn is obtained by irrigating the crop every 10th day. In the first year irrigating every 15th day was just a little inferior to irrigating every 10th day. This indicates that in years of good summer showers and fairly low day-temperatures and in soils with good capacity for retaining soil moisture or when irrigation costs are high, irrigating every 15th day will be economical.

**Summary:** In an experiment to determine the optimum intervals for irrigating a summer crop of spreading groundnut, irrigating every 10th day after first flowering gave the highest yield as well as net return. This interval can be extended to 15 days in a year of good summer rains and in retentive soils but in adverse season this treatment will result in low yields and uneconomic returns.

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#### REFERENCES:

Madras Agricultural Station Reports 1941-'42, 1942-'43, 1952-'53, and 1953-'54.

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