

Effect of irrigation frequency and coir pith application in sesame (*Sesamum indicum*)

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ABSTRACT

Field experiments were conducted during 1992-94 in Irugur soil series at Trichy (T.N.) to study the effect of 3 irrigation intervals and incorporation of raw and composted coir pith on sesame (*Sesamum indicum*). Scheduling of irrigation at 10 days interval and 15 days interval were on par but significantly superior to 20 days interval with regard to seed yield and its components. Composted coir pith application at 10 t/ha combined with 15 days irrigation interval significantly increased growth and yield attributes, seed yield and net income /ha.

Key words: Irrigation frequency, Coir pith, Sesame

Sesame (*Sesamum indicum* L.) is grown as irrigated crop. Limited water supply reduced the canopy development through various physiological processes of the crop (Vyas *et al.*, 1987). There is meagre information on combined use of irrigation and organic matter in this crop. This study was taken up to standardize the irrigation interval and also to augment a source of disposal of coir pith available in plenty in Trichy district of Tamil Nadu.

MATERIALS AND METHODS

Field experiments were conducted during *khari* 1992-93 and 1993-94 at Agricultural Engineering College Farm, Tamil Nadu Agricultural University, Kumulur, Tamil Nadu (Latitude 10°40' N, Longitude 78°50' E and Altitude 70 m). The experimental soil was

sandy loam, low in N (180 kg/ha), P (11 kg/ha) and K (118 kg/ha) with pH 7.7. The soil moisture retentivity at 0.033 and 1.5 MPa was 0.473 cm³/cm³ and 0.198 cm³/cm³ respectively with bulk density of 1.51 g/cm³.

The treatments comprised 3 irrigation intervals (10, 15 and 20 days) as main plots and raw and composted coir pith incorporation (7.5 and 10.0 tonnes/ha) as sub plots. The experiment was laid out in split plot design with three replications. A non organic check was also maintained as standard. The recommended dose of fertilizers viz., 35: 23: 23 kg N, P and K/ha was applied apart from the organic materials. Variety 'TMV 3' was sown on 7 and 5 July in 1992-93 and 1993-94, respectively. The total precipitation during the crop period was 128 and 120 mm in 1992-93 and 1993-94 respectively.

RESULTS AND DISCUSSION

Frequency of irrigation

Irrigating the sesame at 10 days interval being on par with 15 days interval recorded the highest plant height, branches/plant, leaf area, capsules/plant, capsule length, seeds/plant, 1,000 seed weight, total dry-matter and seed and straw yields over 20 days interval. It indicated that crop suffered moisture stress when irrigation interval was extended beyond 15 days. This stress adversely affected the growth and yield attributes and ultimately the seed yield (Table 1). Yield reduction due to decreased irrigation frequency in sesame in sandy loam soil was also reported earlier by Ayyasamy and Kulandaivelu (1992).

Amendment

Coir waste provides an excellent organic material for improving the soil physical and

chemical properties and enhances the water holding capacity of the light textured soils (Ramaswami and Sree Ramulu, 1983). Composted coir pith application at 10 tonnes/ha recorded the highest seed and straw yields as a result of increased growth and yield components. The increased plant growth was attributed to coir waste application which favoured the soil environment in terms of physical properties and nutrient availability. Coir pith application by increasing the retentive capacity of the soil, facilitated lesser irrigation frequency i.e., from 10 days interval to 15 days interval apart from enriching the soil organic matter (Durai, 1992).

Economics

The 10 days irrigation interval gave the highest net return and on par with 15 days interval. The 20 days interval recorded the lowest net returns. Among amendments,

Table 1. Effect of irrigation frequency and coir pith application on growth and yield attributes of sesame (mean of 2 seasons)

Treatment	Growth attributes				Yield attributes			
	Plant height (cm)	Branches/plant (no.)	Leaf area (m ²)	Total drymatter (kg/ha)	Capsules/plant	Length (cm)	Seeds/plant	1,000-seed weight (g)
<i>Irrigation frequency</i>								
10 days	87.5	4.4	0.16	1900	69.5	3.0	3.659	3.6
15 days	85.0	4.4	0.15	1802	66.0	2.8	3.560	3.5
20 days	64.5	3.2	0.12	1712	49.5	1.9	2.817	3.1
CD (P = 0.05)	3.9	0.2	0.009	145	4.5	0.30	192	0.18
<i>Amendments</i>								
<i>Composted coir pith</i>								
7.5 t/ha	70.0	3.5	0.14	1673	62.5	2.6	3.642	3.5
10.0 t/ha	82.5	3.9	0.15	1760	69.5	2.8	3.845	3.7
<i>Raw coir pith :</i>								
7.5 t/ha	64.0	2.7	0.11	1510	43.0	2.0	3.018	3.0
10.0 t/ha	67.0	3.0	0.12	1565	50.0	2.4	3.471	3.3
Without amendments	56.0	2.5	0.09	1486	36.5	1.8	2.731	2.8
CD (P = 0.05)	6.9	0.2	0.007	127	4.0	0.19	17.6	0.16

Table 2. Effect of frequency of irrigation and coir pith application on seed yield and economics of sesame

Treatment	Seed yield (kg/ha)		Net returns (Rs/ha)	
	1992-93	1993-94	1992-93	1993-94
<i>Irrigation frequency</i>				
10 days	882	865	5,175	4,874
15 days	855	843	4,950	4,720
20 days	692	701	4,125	3,995
CD (P = 0.05)	56	39	243	165
<i>Amendments</i>				
Composted coir pith				
7.5 t/ha	775	793	4,742	4,452
10.0 t/ha	835	875	5,120	5,065
Raw coir pith :				
7.5 t/ha	595	582	3,920	3,743
10.0 t/ha	621	610	4,345	4,110
Without amendments	488	504	4,075	3,895
CD (P = 0.05)	44	69	185	242

Note : Cost/kg

Sesame seed : Rs. 15.00

Coir pith

- Raw : Rs. 0.50

- Composted : Rs. 0.60

composted coir pith application at 10 tonnes/ha resulted in the highest net return (Table 2).

It may thus be concluded that irrigation interval can be extended to 15 days by application of composted coir pith at 10 tonnes/ha for increasing the productivity of sesame.

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