

## EFFECT OF DRYLAND TECHNOLOGIES ON THE YIELD OF SESAME UNDER RAINFED CONDITION

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### ABSTRACT

Field experiments were conducted during *Kharif* 1992 and 1993 at the Regional Research Station, Vridhachalam to evaluate the effect of different dryland technologies individually and in combination on the yield attributes and the yield of sesame (TMV4) under rainfed conditions. The results of the study revealed that combination of all the dryland technologies viz., seed treatment with 2 per cent  $\text{KH}_2\text{PO}_4$ , and *Azospirillum*, forming broad bed and furrows, application of composted coirpith, application of enriched FYM with 75 per cent or recommended dose of fertilizer, pre sowing incorporation of fluchloralin 1 kg/ha + 1 hand weeding increased the plant height, root length, number of branches per plant, number of capsules per plant and the grain yield of sesame over farmer's practices, and the other individual dryland technologies. The increased yield by the combination of different dryland technologies was 82.7 per cent over control. All the individual dryland technologies also increased the yield over farmer's practices.

**KEY WORDS :** Rainfed Sesame, Yield, Dry Land Technologies

Improved practices in dryland consists of improved seed, fertilizers, and improved management aiming at timelines in operation and precision in the use of inputs. Kandiannan and Rangasamy (1982) indicated that integration of improved practices increased the sorghum yield under dryland conditions. Selvam *et al.* (1992) stated that 51 per cent yield increase in rainfed groundnut is due to improved management practices. But such studies for rainfed sesame was not carried out in red soil areas. Hence, an experiment was carried out to study the effect of different dryland technologies on the yield of sesame under rainfed conditions.

### MATERIALS AND METHODS

Field experiments were conducted in the red lateritic soil of the Regional Research Station, Vridhachalam on rainfed sesamum during *Kharif* seasons of 1992 and 1993. The pH of the soil of the experimental area was about 7.4 with low in available N (232.4 kg/ha), and available P (10.2 kg/ha) and medium in available K (248 kg/ha). The experiment was laid out in randomised block design with three replications during 1993 and four replications during 1992. The different treatments consists of seed hardening with 2 per cent potassium dihydrogen phosphate, seed treatment with *Azospirillum* (3 packets/5 kg of seed), forming broad bed and furrows (120/30 cm), application of

enriched farm yard manure (FYM) with 75 percent recommended does of fertilizer, pre sowing incorporation of fluchloralin @ 1 kg/ha + 1 hand weeding 30 DAS individually and combination of all these treatments were compared with farmer's practices of cultivation. Recommended does of N, P and K was applied to all the treatments as basal except application of enriched FYM with 75 per cent of the recommended dose of fertilizers. All the treatments were given one hand weeding 30 DAS including the farmer's practices.

### RESULTS AND DISCUSSION

The data on plant height, root length, weed dry matter production, number of branches per plant, number of capsules per plant and yield of sesame are given in Table 1 and 2.

The treatment consists of combination of all the dryland technologies (T7) significantly influenced the plant height and root length over other treatments and farmer's practices. The treatments consists of individual dryland technologies also influenced the plant height and root length over farmer's practices. The plant height and root length was drastically reduced in farmer's practices of cultivation. The weed dry matter production (Table 1) was significantly reduced by the pre-sowing incorporation of fluchloralin 1 kg/ha + 1 hand weeding (30 DAS) when it was adopted either individually or in

Table 1. Effect of dryland technologies on the yield attributes and yield of sesame under rainfed condition

		Branches/plant			No. of capsules/plant			Yield kg/ha			Percentage of increase over control mean
		1992	1993	Mean	1992	1993	Mean	1992	1993	Mean	
T1	Seed hardening 2% KH <sub>2</sub> PO <sub>4</sub>	5.7	5.3	5.5	68.6	59.8	64.2	864	571	718	49.9
T2	Seed treatment with <i>Azospirillum</i> 3 pkt/5kg of seed	5.6	5.2	5.4	68.1	59.2	63.7	854	558	789	47.4
T3	Broad bed and furrow (120/30 cm)	5.9	5.5	5.7	68.3	59.4	63.9	860	569	715	49.3
T4	Composted coirpith application (12.5 t/ha)	6.0	5.8	5.9	70.3	65.8	68.1	915	647	781	63.0
T5	Enriched FYM with 75% recommended NPK	6.4	6.1	6.3	72.0	66.4	69.2	926	651	789	64.7
T6	PSI of fluchloralin 1.0 kg ai/ha + 1 HW 30 DAS	6.7	6.4	6.6	75.9	67.3	71.6	932	663	798	66.6
T7	T1 + T2 + T3 + T4 + T5 + T6	7.5	7.1	7.3	83.6	78.4	81.0	985	765	875	82.7
T8	Farmer's Practices	4.5	3.9	4.2	59.4	40.4	49.9	609	348	479	-
	SEd	0.22	0.32	-	1.99	2.2	-	10.6	36.7	-	-
	CD	0.63	0.69	-	5.63	5.8	-	29.9	78.9	-	-

FYM : Farm yard manure; PSI : Pre-sowing incorporation; HW : Hand Weeding.

combination with other dryland technologies. Hence, herbicide application is essential for the control of weed reduction and weed dry matter production under rainfed condition.

Integration of improved dryland technologies (T7) significantly influenced the number of branches per plant, number of pods per plant and sesame grain yield over other treatments and farmer's practices. The yield increase in the treatment was 82.7 per cent over farmer's practices. This might be due to the effect of enriched farm yard manure, application of composted coir pith, keeping the land weed free due to the herbicide applications and the influence of other improved dryland technologies over growth attributes, yield attributes and yield of sesame. Similar findings were reported by Kandiannan and Rangasamy

(1989) in rainfed sorghum, where integration of improved dryland practices increased the sorghum grain yield. All the individual dryland technologies adopted individually also influenced the yield over farmer's practices.

In conclusion, adoption of improved dryland technologies in combination viz., seed hardening with 2 per cent potassium dihydrogen phosphate, seed treatment with *Azospirillum* formation of broad bed and furrow application of composted coirpith, application of enriched FYM with 75 per cent recommended dose of fertilizer, and presowing incorporation of fluchloralin 1 kg/ha + 1 hand weeding (30 DAS) increased the number of branches per plant, number of capsules per plant and yield of sesame under rainfed condition.

Table 2. Effect of dryland technologies on the plant height, root length and weed dry matter production

Treatments	Plant height (cm)		Root length (cm)		Weed DMP gm/25 <sup>m</sup> <sub>2</sub>		
	1992	1993	1992	1993	1992	1993	
T1	Seed hardening 2% KH <sub>2</sub> PO <sub>4</sub>	132.7	121.6	13.7	13.3	101.7	154.2
T2	Seed treatment with <i>Azospirillum</i> 3 pkt/5kg of seed	130.3	119.3	14.2	13.4	110.3	168.3
T3	Broad bed and furrow (120/30 cm)	130.4	119.3	14.5	14.2	103.4	161.4
T4	Composted coirpith application (12.5 t/ha)	133.6	122.9	14.8	14.3	81.6	128.7
T5	Enriched FYM with 75% recommended NPK	131.5	120.5	15.0	14.5	101.4	157.3
T6	PSI of fluchloralin 1.0 kg ai/ha + 1 HW 30 DAS	134.0	123.4	15.4	14.8	36.5	6.9
T7	T1 + T2 + T3 + T4 + T5 + T6	138.6	130.7	16.3	15.9	33.2	6.6
T8	Farmer's Practices	127.2	110.8	11.8	10.1	137.3	198.7
	SEd	2.30	2.87	0.30	0.26	2.5	4.4
		86		0.88	0.56	7.3	9.5

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## EFFICACY OF PETROLEUM ETHER EXTRACT OF PLANT PARTS ON THE BIOLOGY OF *Sitotroga cerealella*

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### ABSTRACT

The petroleum ether extract of botanicals viz., leaves of *Eucalyptus teriticornis*, *Bassia latifolia*, *Ocimum basilicum*, *Pongamia glabra*, *Tribulus terrestris* and *Tridax procumbens* and rhizomes of *Acorus calamus* was prepared at four concentrations viz., 0.05, 0.1, 0.15 and 0.2 per cent by dissolving them in acetone. They were used to evaluate their efficacy on the biology of *Sitotroga cerealella* (Oliv.) The observations taken on fecundity, hatching, developmental period and adult emergence indicated that the fecundity and percentage of egg hatching was significantly lowest in grains treated with petroleum ether extract of *E.teriticornis* 0.2% followed by *T.terrestris* 0.2%. The developmental period was prolonged in grains treated with *T.terrestris* 0.2% and the per cent adult emergence was lowest in *A.calamus* 0.2 and 0.15 per cent.

KEY WORDS : Botanicals, *S.cerealella*, Petroleum Ether Extract, Paddy

Rice Angoumois grain moth, *Sitotroga cerealella* (Oliv.) is a primary pest of whole cereal grains, including paddy. They are often infested in the field before harvest as well as during storage. The effectiveness of plant materials in the management of this pest was reported by many authors. In the present study, the efficacy of certain botanicals, viz., leaves of *Eucalyptus teriticornis* Smith., *Bassia latifolia* Roxb., *Ocimum basilicum* L., *Pongamia glabra* Vent. *Tribulus terrestris* L. on the biology of this pest was evaluated.

### MATERIALS AND METHODS

The plant parts were shade dried, powdered and passed through 60 mesh sieve. Twenty g of powdered material was extracted serially in soxhlet apparatus with 200ml petroleum ether (6.p, 40-60°C). The extract was made free of solvent on water bath. The extraction was continuously done for 30h. The total residue from 20g sample was weighted and redissolved in acetone to obtain required concentrations viz., 0.05, 0.1, 0.15 and 0.2 per cent (Prabhu *et al.*, 1973; Shanthi, 1989). One ml of the extract was mixed thoroughly with 10g of

paddy grains and allowed to equilibrate for atleast 24 ha before testing. Controls with and without acetone were maintained for comparison. The treated grains were kept in polythene bags with numerous pinholes. One pair of newly emerged adults was introduced into each bag.

Total number of eggs laid and hatched were counted 10 days after introduction by carefully examining the grains and the percentage of hatching was calculated. The hatched eggs were white with broken chorion (Ragumoorthy, 1987) while the unhatched eggs remained light orange in colour.

After 25 days of introduction of insects, the number of adults emerged was counted daily and removed. This observation was continued up to 40 days. The mean development period was calculated from the day of introduction of insects to 50 per cent adult emergence (Howe, 1971).

The number of adults emerged out of the total number of eggs hatched expressed as adult emergence percentage

