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EFFECT OF ROW SPACINGS ON THE EFFICIENCY OF TWO SAFFLOWER VARIETIES

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The Gila (spined) variety of safflower produced maximum number of branches, capitula per plant per hectare and per capitulam seed yield, whereas maximum plant height, seeds per capitula and 1000 seeds weight was recorded by the local (spineless) variety.

The maximum plant height, number of branches, capitula per plant and 1000 seeds weight was produced in 60 cm rows apart, while 90, 75 and 45 cm rows apart gave maximum seeds, seed weight per capitulam and per hectare seed yield respectively.

The treatment interaction in all the observations statistically were non-significant.

Key words: Capitula, Gila, Capitulam.

INTRODUCTION

Safflower provides a highly nutritive diet for human beings, a valuable food for animals and yields a valuable oil, oil free meal and dye for colouring purpose. These factors increase its commercial importance.

The oil of safflower, being edible, can be used for cooking purposes, for the manufacture of vegetable ghee and has great industrial value. It has water proofing and cementing importance and is used for fixing tiles on the walls. Its performance is better than that of plaster of Paris in sealing glasses.

High yields in field crops are said to be based on the cultural practices in vogue in an area. Cultural practices are the most important tool in the hands of a farmer in improving the yield potential of any crop. This premise also holds good for safflower crop. The success of safflower crop greatly depends upon row spacing. In closer row spacings when the plant population is increased there occur fewer heads/plant [2] seeds per head, 100 seeds weight [4,5]. Beech and Norman [2] observed little effect of density on 100 seeds weight and number of seeds per head. Row distance and varieties are more important for safflower cultivation and achieved better results [1] in closer row spacings in both varieties.

The main objectives of experiment was therefore to observe the effect of different row spacings on the growth and yield of spined (Gila) and spineless (local) safflower varieties in order to work out appropriate row spacing and variety for safflower crop to get better return under the agro-climatic condition of Tandojam.

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MATERIAL AND METHODS

An experiment to note the effect of row spacings (45, 60, 75, 90 cm) on the efficiency of two safflower varieties (spined or Gila and local or spineless) was laid out at Sind Agriculture University, Tandojam, in a simple completely randomized block design with factorial arrangements in four replications having 5 x 9 meters plot size. In all six irrigations were applied at an interval of 20 days each. NP fertilizers in the form of urea and single superphosphate were applied at the rate of 100-50 NP Kg/ha.

The sowing of the experiment was done by means of single coulter drill in lines 45, 60, 75 and 90 cm apart. The thining of the plots were done before the first irrigation at 7-8 cm plant distance.

RESULTS AND DISCUSSION

1. *Plant height.* Plant height decreased as the distance between two rows was increased from 60 to 90 cm (Table 1). Plant height was greater in 60 cm apart rows (119.18 cm) and spineless variety (111.61 cm). It was statistically significant.

Treatment interaction of spined (Gila) variety with 60 cm apart rows recorded 121.70 cm maximum plant height followed by the interaction of spineless (local) variety with 75 cm apart rows (Table 2) was non-significant statistically. This (118.65 cm) agrees with the findings of Brauns [4] and Naser *et al.* [3].

2. *Branches/plant.* The maximum 12.30 and 12.95 average number of branches per plant (Table 1) were re-

corded under 60 cm apart rows and Gila (spined) variety. This was statistically not significant.

The treatment interaction (Table 2) of 90 cm apart rows with Gila (Spined) variety depicted 16.20 maximum number of branches per plant and agreed with the findings of Peterson and Walter [5].

3. *Capitula plant.* The maximum 15.53, 14.83 and 17.20 average capitula per plant (Table 1) were produced

Table 1. Effect of row spacing on the yield components and yield of two safflower varieties.

Treatments	Observations						
	Plant height (cm)	Branches/ plant	Capitula /plant	Seeds/ capitulam	Seed weight /capitulam (gm)	Seed index (gm)	Grain yield/ha (kg)
Row spacings							
45 cm	111.89	10.18	13.33	23.98	0.87	36.64	11476.61
60 cm	119.18	12.30	14.83	23.03	0.83	37.36	7160.93
75 cm	102.30	11.33	13.53	23.12	1.35	35.88	6742.51
90 cm	102.65	11.68	11.16	24.47	0.77	35.17	5989.36
SE =	–	1.84	1.98	2.60	0.26	1.37	–
Cd1 =	11.50	–	–	–	–	–	1.64
Varieties							
1. Gila (Spined)	106.40	12.95	15.53	23.41	1.12	36.08	7908.10
2. Local (Spineless)	111.61	9.79	10.89	23.89	0.78	34.44	7776.60
SE =	2.77	1.30	–	1.83	0.17	0.96	0.40
Cd1 =	–	–	4.11	–	–	–	–

Table 2. Effect of row spacings on the yield components and yield of two safflower varieties (interaction results).

Interactions variety-row spacing	Observations						
	Plant height (cm)	Branches/ plant	Capitula /plant	Seeds/ capitulam	Seed weight /capitulam (gm)	Seed index (gm)	Grain yield/ha (kg)
Gila x 45	114.35	9.95	14.70	21.91	0.85	34.20	11428.79
Gila x 60	121.70	13.70	17.20	21.44	0.82	36.75	6049.13
Gila x 75	85.95	11.85	14.75	26.43	2.03	36.50	6527.32
Gila x 90	103.60	16.20	15.45	23.84	0.78	36.87	7627.16
Local x 45	109.42	10.41	11.95	26.04	0.88	39.07	11524.43
Local x 60	116.65	10.90	12.45	24.61	0.84	37.97	8272.72
Local x 75	118.65	10.70	12.30	19.80	0.66	35.25	6957.69
Local x 90	101.70	7.15	6.86	25.10	0.76	33.47	4351.55
SE =	5.45	2.61	2.80	3.69	0.37	0.50	0.80

by spined (Gila) variety; 60 cm apart rows individually as well as in their interaction (Table 2) respectively and are in agreement with the findings of Brauns [4] who got fewer heads/plant in closer rows.

4. *Seeds/capitulam.* The treatment as well as interactions were non-significant statistically. The spineless (local) variety 90 cm apart rows and the interaction of spined (Gila) variety with 75 cm apart rows produced the maximum 23.89, 24.47 and 26.43 seeds per capitulam respectively. Similar results were observed by Brauns [4].

5. *Seed weight/capitulam.* The treatment as well as their interactions showed non-significant results statistically. Spined (Gila) variety; 75 cm apart rows and their interaction recorded 1.12; 1.35, and 2.03 g seed weight/capitulam respectively. This is supported by the findings of Brauns [4].

6. *Seed index (1000 seeds weight).* Treatments and their interactions (Table 1) were non-significant statistically. The maximum 36.44; 37.36 and 39.07 g weight of 1000 seeds were recorded under local (spineless) variety; 60 cm apart rows and in the interaction of local (Spineless) variety with 45 cm apart rows respectively agree with the findings of Beech and Norman [2].

7. *Grain yield/hectare.* The maximum 11476.61; 7908.10 and 11524.43 kg/ha grain yields were recorded under 45 cm apart rows; Gila (spined) variety and in the treatment interaction of 45 cm apart rows with local (spineless) variety respectively. This is supported by the findings of Beech and Norman [2], Brauns [4], Kazi *et al.* [1] and Nasar *et al.* [3].

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