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Effect of Plant Spacing on Productivity of New Safflower Genotypes

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ABSTRACT

The experiment was conducted at the Agricultural research station, Tandur during 2008-09 with four spacings viz. 45x 20 cm, 45 x 30 cm, 60 x20 cm and 60 x 30 cm and entries viz. NARI 48, A1, Manjira, PBNS 40, NARI NH-1 in a split plot design with two replications. Adoption of 45 cm spacing between rows irrespective of intra row spacing recorded significantly highest seed yield over 60 cm spacing. Maximum safflower seed yield was recorded with 45 x 20cm (1283kg ha^{-1}) which was on par with 60 x 20cm spacing (1223 kg ha^{-1}). None of the AVHT-II entries responded positively to the wider plant geometry of 60 x 30 cm (818 kg ha^{-1}). Among the AVHT-II entries NARI NH -1 has produced maximum seed yield (1339 kg ha^{-1}), which was on par with A1 (1200 kg ha^{-1}). Similar trend noticed in gross returns, net returns and BC ratio.

Key words : Genotypes, Safflower, Spacing.

Safflower (*Carthamus tinctorious* L.) is one of the oldest oilseed crops of the world. Today, it is a minor crop, cultivated in more than sixty countries world wide. India, USA and Mexico are the major producers of the crop, whereas, Ethiopia, Kazakhstan, China, Argentina and Australia, account for the minor producers of the crop. Worldwide, it is cultivated in area of 8.2 lakh ha with a production of 5.8 lakh tones and productivity of 709 kg ha^{-1} (2006-07). In India it is grown in 3.8 lakh ha, with a production of 2.4 lakh tones and productivity of 637 kg ha^{-1} (Anonymous 2006-07).

Safflower is known since time immorial, either for its orange red dye (carthamin) extracted from its coloured florets or for its valued oil. It is an important *rabi* oilseed crop of the country, usually cultivated in vertisols under residual moisture conditions. Andhra Pradesh, Maharashtra and Karnataka are the major growing states of the country. In Southern Telangana zone of Andhra Pradesh safflower is grown after short duration pulse. The maximum yield potential of safflower can be realized by adopting suitable agronomic practice like timely sowing, optimum fertilizer dose, use of promising genotypes and maintaining optimum plant density (Sakir and Basalma, 2005). Hence the present investigation was undertaken to study the performance of safflower genotypes at different plant spacings under rainfed condition.

MATERIAL AND METHODS

The field experiment was laid in a split plot design with two replications at Agricultural Research Station, Tandur during the post rainy season of 2008-09 to find out the effect of plant density on productivity of new safflower genotypes. The soil of the experimental site was slightly alkaline (Soil pH 8.3) with low organic carbon (0.54%). The available N,P and K contents of soils were 230, 17 and 690 kg ha^{-1} respectively.

RESULTS AND DISCUSSION

Results indicated that plant geometry had considerable impact on seed yields of safflower. Seed yield of safflower significantly influenced by different plant spacings and genotypes. Adoption of 45 cm of spacing between rows recorded highest seed yield over 60cm of row spacing. Maximum safflower seed yields were recorded with recommended spacing of 45cm X 20cm (1283 Kg ha^{-1}) which was on par with 60cm X 20cm spacing (1223 Kg ha^{-1}) and 40x30 cm (1024 Kg ha^{-1}). None of the AVHT-II entries responded positively to the wider plant geometry of 60cm X 30 cm (818 Kg ha^{-1}). Among the AVHT-II entries, NARI-NH-1 had produced maximum seed yield (1339 Kg ha^{-1}) and it was on par with A 1 (1200 Kg ha^{-1}). Interaction effect was found non-significant. Similar findings were noticed by Kubsad *et al* (2007). The gross returns, net returns and B: C ratio followed similar trend. Highest B: C ratio of 4.95 was registered by 45 x 20 cm spacing followed by 60 x 30 cm spacing (4.67 B: C ratio). NARI NH-1 recorded the highest B: C ratio of 5.21(Table No.1). The results were in confirmation with that of Uke *et al* (2009). Hence the present day indicated that the best spacing for saffer is 45 X 20 cm and it is rcommended for geting returns is the crop.

Table 1. Seed yield and economics of safflower AVHT-II entries to plant spacings under rainfed conditions.

S.No.	Treatment	Seed yield (Kg ha^{-1})	Gross returns (Rs. ha^{-1})	Cost of cultivation (Rs. ha^{-1})	Net returns (Rs. ha^{-1})	B:C ratio
I.	Plant Spacings					
1	S1= 45 cm X 20 cm	1283	28868	4850	24018	4.95
2	S2= 45 cm X 30 cm	1024	23040	4850	18190	3.75
3	S3= 60 cm X 20 cm	1223	27518	4850	22668	4.67
4	S4= 60 cm X 30 cm	818	18405	4850	13555	2.79
	Mean	1087	24458	4850	19608	4.04
	Sem+	81.0				
	CD (P=0.05)	231				
	CV (%)	19.7				
II.	AVHT-II Entries					
1	V1-NARI-48	931	20948	4850	16098	3.32
2	V2-A1	1200	27000	4850	22150	4.57
3	V3-Manjira	967	21758	4850	16908	3.49
4	V4- PBNS-40	998	22455	4850	17605	3.63
5	V5- NARI-NH-1	1339	30128	4850	25278	5.21
	Mean	1087	24458	4850	16340	3.37
	Sem+	84				
	CD (P=0.05)	252				
	CV (%)	15.5				
III.	Interaction					
	Sem+	146				
	CD (P=0.05)	NS				
	CV (%)	15				

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