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Effect of safflower aphid on 20 different safflower germplasms for biometric observations

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Abstract

A field experiment was conducted in Randomized Block Design at Safflower Research Station, VNMKV, Parbhani. Twenty genotypes of safflower were used as source material for study. It was aimed to determine the effect of safflower aphid on biometric parameters. For this purpose in the research, plant height, number of branches, number of capitula, biological yield, 100 seed weight, oil content were recorded. According to result, plant height ranged from 58.75 cm to 86.80 cm, number of branches ranged from 56 cm to 8.30 cm, number of capitula ranged from 30.15-13.00, biological yield ranged from (3.90 q ha⁻¹) - (1.22 q ha⁻¹), 100 seed weight ranged from 6.20 g - (4.10 g) and oil content ranged from (40.91%) - (28.28%). According to the study results Among the 20 genotypes RVS-18-01 recorded maximum plant height (86.80 cm), highest number of branches was recorded in Bhima (8.30), maximum number of capitula was observed in ISF-116 (30.15), highest biological yield was recorded in PBNS-184 (3.90 q ha⁻¹), highest 100 seed weight was recorded in PBNS-183 (6.20 g) and highest oil content recorded in ISF-87- 15 (40.91%).

Keywords: Safflower aphid, safflower germplasms, biometric observations

Introduction

Safflower (*Carthamus tinctorius* L.) was initially grown to produce dyes for food and fabric and for medicinal use (McPherson *et al.*, 2004) [3]. Nowadays, scientific interest in this species is mainly due to its high-quality vegetable oil for nutritional and industrial applications. The nutritional value of safflower oil is, in fact, similar to that of olive oil and, for this reason, the species has gained importance in recent years as a result of human consumption in arid and semi-arid regions. Safflower oil contains two main unsaturated fatty acids: Oleic and linoleic acids, which represent 90% of the total fatty acid content, while the remaining 10% corresponds to saturated fatty acids, such as palmitic and stearic acids (Bella *et al.*, 2019) [1]. However, the oil content and seed yield of safflower are lower than other oil crops (sunflower, canola etc.), so safflower agriculture has not been able to develop in our country. Therefore, research must be done in order to increase seed yield and oil content and breeding studies must be conducted in order to develop new cultivars. Seed yield and oil content are important traits and subject to many variables affecting growth of safflower (Volkman and Rajcan 1999) [4].

Material & Methods

Twenty genotypes of safflower supplied by the Safflower Research Station, VNMKV, Parbhani were used as source material for study. The experiment was laid out at Safflower Research Station, Research farm in a Randomized Block Design with 2 Replications and 20 genotypes as treatments. Five plants were selected from each treatment and the selected plants were tagged with wax coated labels.

Biometric observation was recorded *viz.* Plant height, number of branches, number of capitula, biological yield, 100 seed weight and oil content

Result and Discussion

Plant height

The data on plant height (cm) shown in (Table 1). The plant height ranged from 58.75 cm to 86.80 cm. Among the different genotypes, the genotype RVS-18-01 (86.80 cm) recorded highest plant height. However, lowest plant height was recorded in PBNS-86 (58.75 cm).

Number of branches

The data on number of branches in (Table 1). The number of branches ranged from 4.56 cm to

8.30 cm. significantly more number of branches were recorded from the genotypes SSF-17-04 (8.30). Whereas minimum number of branches was recorded on Bhima (4.56).

Number of capitula

Data on mean number of capitula of safflower presented in (Table 1). The number of capitula ranged from 30.15-13.00. significantly higher number of capitula was observed in the genotypes ISF-116 (30.15). The lowest number of capitula was observed on Bhima (13.00).

Biological yield

Among the genotypes screened difference in biological yield (Table 1). The genotypes PBNS-184 (3.90 q ha⁻¹) recorded highest biological yield. The lowest biological yield observed in PBNS-86 (1.22 q ha⁻¹).

100 seed weight

Data on mean 100 seed weight of safflower presented in (Table 1). The differences in 100 seed weight were significant among the different genotypes, PBNS-183 (6.20 g) had

highest 100 seed weight. The lowest 100 seed weight observed in ISH-400 (4.10 g).

Oil content

The data on oil content revealed in (Table 1). Among the genotypes screened difference in oil content were significant, ISF-87- 15 (40.91%) highest oil content. The lowest oil content observed in ANG-18-02 (28.09%) followed by A-I (28.28%).

Lattief (2012) [2] evaluated 25 safflower genotypes and found that Line1682 produced highest plant height (199.7 cm), number of branches per plant (9.00), number of capitula per plant (25.69), weight of seed per plant (39.46 g), seed yield (28.46 kg/ha) and seed oil content (36.50%).

Bella *et al.* (2019) [1] screened 16 safflower germplasm accessions and observed significant differences regarding maximum number of branches (14.5) and highest number of capitula per plant (16) in CTI 17 germplasm. The highest value for seed yield (1.64 t/ha) and seed oil yield (0.59 t/ha) were recorded in CTI 17 germplasm.

Table 1: Effect of safflower aphid on biometric parameters

Genotypes	Plant height (cm)	No. of Branches	No. of Capitula	Biological yield	100 seed weight	Oil content (%)
RVS-18-03	75.60	6.90	23.50	1.87	6.00	34.35
A-I	84.80	7.94	30.15	1.36	5.89	28.28
SSF-17-01	82.50	6.75	22.90	1.33	5.37	32.88
ANG-18-02	73.30	6.65	25.45	1.91	5.70	28.09
DSH-185	72.10	6.40	21.10	1.45	5.58	33.00
ISF-849-sel-16	71.00	6.35	20.85	2.27	5.25	33.13
ISH-400	59.85	4.83	16.55	2.40	4.10	31.81
PBNS-183	66.13	5.85	17.85	2.13	6.20	31.46
SSF-17-05	70.85	6.30	20.15	1.99	5.18	32.34
RVS-18-01	86.80	7.80	29.30	3.73	6.16	39.97
ISF-87-15	69.65	6.20	21.55	0.64	3.95	40.91
PBNS-184	65.20	5.75	17.85	3.90	4.70	29.84
ISH-401	64.40	5.66	18.80	3.79	4.53	32.34
ISF-116	83.00	7.50	30.15	2.19	6.00	32.96
PBNS-12	68.95	6.10	19.75	1.57	4.96	36.72
SSF-17-04	85.25	8.30	28.60	1.61	5.95	30.54
ISH-402	83.00	7.40	26.35	1.80	5.65	32.86
PBNS-86	58.75	4.72	13.47	1.22	4.20	32.22
PBNS-154	81.00	7.25	22.05	2.29	5.43	30.68
BHIMA(C)	60.00	4.56	13.00	1.92	5.05	34.67
S.Em.±	2.93	0.31	1.51	0.1044	0.21	1.17
C.D. at 5%	8.68	0.93	4.47	0.309	0.64	3.46

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