



Screening of Different Genotypes of Niger (*Guizotia abyssinica* Cass) against Major Insect Pests

Deepali Vishwakarma ^{a++*}, Anand Kumar Panday ^{b#},
Yogesh Kumar ^{c†}, Payal Sharma ^{d‡}, Dwarka ^{e++},
Sheeren Parveen ^{e++}, Dheerendra Mahor ^{f,g^}
and Manoj Kumar Ahirwar ^h

^a Department of Entomology, RVSKVV, Gwalior, Madhya Pradesh- 474002, India.

^b College of Agriculture, JNKVV, Jabalpur, Madhya Pradesh-482004, India.

^c Willowood Chemicals Ltd. Sriganganagar, Rajasthan-335001, India.

^d Corteva Agriscience Seed Pvt. Ltd. Baran, Rajasthan- 325205, India.

^e Department of Entomology, JNKVV, Jabalpur, Madhya Pradesh- 482004, India.

^f Department of Entomology, B.M. College of Agriculture, Khandwa, Madhya Pradesh- 450001, India.

^g RVSKVV, Gwalior, Madhya Pradesh- 474002, India.

^h SRF, CAZRI, KVK, Pali, Rajasthan- 306401, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/IJPSS/2023/v35i193682

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here:

<https://www.sdiarticle5.com/review-history/103499>

Original Research Article

Received: 27/05/2023

Accepted: 31/07/2023

Published: 04/09/2023

⁺⁺PhD Research Scholar;

[#] Scientist/Assistant Professor;

[†] Development Officer;

[‡] Territory sales manager,;

[^] Assistant Professor (Guest Teacher);

^{*}Corresponding author: E-mail: 97deepalivishwakarma@gmail.com;

ABSTRACT

An experiment was conducted at Project Coordinating Unit Sesame and Niger, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur (M.P.) during Pre-Rabi season in the year 2020-21, encompassed of 21 promising genotypes of Niger which were screened for resistance/susceptibility against whiteflies, leafhoppers, and capsule fly. The genotypes JNS-28, JNS-9, JNC-6, NRS-1805, IGPN-15-02 and NRS-1513 were found promising against whitefly. The genotypes JNS-2017-8, IGPN-15-02, NRS-1513, NRS-1511 and JNS-2017-1 were found promising against the incidence of leafhopper. The genotypes DNS-19-24, JNS-2017-8, JNS-2016-1115, NRS-1513 and NRS-1807 were found promising against capsule fly.

Keywords: Screening; susceptibility; genotypes JNS-2017-8 and 21 promising genotypes.

1. INTRODUCTION

Niger (*Guizotia abyssinica*) is an economically important edible oilseed crop. It is crucial minor oilseed crop having therapeutic properties mainly grown in India and Ethiopia. Niger is a diploid ($2n = 2x = 30$), oil crop species belongs to Asteraceae family. It is an annual crop with a capitulum that consists of six to eight fertile female ray florets and 40–60 hermaphroditic disk florets. The corymbs cymes of heads, 5 broadly ovate-obovate outer involucral leaves, 5-nerved paleae, and bigger achenes, are its main discriminating characters from other *Guizotia* species. Niger is a strictly outcrossing species with a sporophytic self-incompatibility mechanism, and is mainly pollinated by insects [1-5]. The earliest name given to this plant was *Verbesina oleifera*. Niger (*Guizotia abyssinica* L.f.Cass) is an important minor oilseed crop of India and developed mainly in hilly and tribal areas, it is nutritious in terms of its 38 to 42% of quality oil with 18 to 20% protein in the seed. It is the lifeline of tribal agriculture and economy in India [6]. An integrated Integrated pest management strategy, to increase the efficiency of fertilizer use, is being developed. Yield losses, due to various diseases and insect pests in different states, have been assessed and a management schedule for major insect pests (niger caterpillar, niger capsule fly, cutworms, semi looper, Bihar hairy caterpillar, and aphids) [7-12]. One of the hurdle in the production of Niger is the massive damage caused by several insect pests under certain agro production situations [13,14]. Niger crop is attacked by 24 insects species from germination to till the harvest in both Ethiopia and India [15-19]. The niger capsule fly is the most serious insect pest of niger, both in Ethiopia and India (Bayeh and Madhin, 1992) [20-23]. Cultivar resistance has been identified as the most desirable and economic tactics in the management of insect pests and is the best

alternative to synthetic insecticides, providing an eco-friendly, environmentally safe strategy for fruitful management of insect pests [24-29]. It can be united into ecologically sound integrated pest management programmes [30-33]. Before evolving insect pest management programme for a specific agro-ecosystem, it is obligatory to have basic information on the occurrence of the pests in relation to weather parameters which helps in discovering appropriate time of action and suitable method of management.

2. MATERIALS AND METHODS

Experiment was designed in Randomized Block Design (RBD) with three replications, with 21 genotypes. For the screening of different promising genotypes against major insect pests 21 promising genotypes were grown in three replications. Weekly observations were taken, started from 15 days after sowing and keep on till the presence of insect pests. From each genotype five plants were selected randomly to put down the observations. The population of sucking insect pests (leafhopper and whitefly) were documented by counting the number of nymphs and adult on six leaves/plant (2 leaves each from top, middle and bottom of the plants). The population of capsule fly was taken down by counting the number of adult per plant.

3. RESULTS AND DISCUSSION

The aggregate of average population data of whitefly show that all the genotypes differed significantly in respect to record the whitefly population per three leaves per plant. Among the screened genotypes the minimal population of whitefly (1.32 whitefly/three leaves) was reported from the genotype JNS-28 succeeded by (1.63 whitefly/three leaves) JNC-6 and JNS-9 (1.43 whitefly/three leaves) while the highest population (2.78 whitefly/three leaves) was

Table 1. Response of different genotypes of niger against whitefly

S. No.	Genotypes	White fly population/three leaves Days after sowing (DAS)								Overall mean
		15	22	29	36	43	50	57	64	
1	JNS-2017-1	3.27 (1.94)	3.16 (1.91)	3.37 (1.96)	3.00 (1.86)	3.24 (1.93)	2.90 (1.84)	2.06 (1.57)	1.29 (1.33)	2.78 (1.81)
2	NRS-1511	3.00 (1.87)	2.80 (1.82)	2.80 (1.81)	2.00 (1.58)	2.60 (1.75)	2.63 (1.76)	1.53 (1.42)	1.01 (1.22)	2.29 (1.67)
3	JNS-2017-8	3.60 (2.02)	2.60 (1.76)	1.93 (1.56)	2.47 (1.72)	1.41 (1.38)	2.10 (1.59)	1.35 (1.35)	0.97 (1.21)	2.05 (1.59)
4	NRS-1513	2.53 (1.74)	1.80 (1.52)	1.53 (1.42)	2.33 (1.68)	1.66 (1.46)	1.34 (1.35)	1.53 (1.42)	1.00 (1.22)	1.71 (1.48)
5	JNS-2017-13	2.73 (1.80)	2.67 (1.78)	2.40 (1.70)	2.60 (1.75)	1.90 (1.54)	1.09 (1.26)	1.50 (1.41)	1.35 (1.36)	2.03 (1.59)
6	IGPN-15-02	1.60 (1.45)	2.34 (1.68)	2.47 (1.72)	1.37 (1.37)	1.88 (1.54)	1.20 (1.30)	1.33 (1.35)	1.20 (1.30)	1.67 (1.47)
7	JNS-2017-17	3.53 (2.01)	3.27 (1.93)	2.47 (1.72)	1.87 (1.53)	1.93 (1.56)	1.40 (1.37)	1.55 (1.43)	1.16 (1.29)	2.14 (1.62)
8	IGPN-17-02	1.47 (1.40)	2.27 (1.66)	2.93 (1.84)	2.07 (1.60)	1.93 (1.56)	1.05 (1.23)	1.78 (1.51)	1.09 (1.26)	1.82 (1.52)
9	JNC-6	1.40 (1.38)	2.27 (1.66)	1.27 (1.33)	1.53 (1.42)	1.80 (1.52)	2.13 (1.62)	1.46 (1.40)	1.21 (1.31)	1.63 (1.46)
10	ONS-182	2.80 (1.82)	2.60 (1.76)	2.00 (1.57)	2.27 (1.65)	1.65 (1.46)	1.40 (1.37)	1.51 (1.41)	0.86 (1.16)	1.89 (1.55)
11	JNS-28	1.01 (1.23)	1.47 (1.40)	2.07 (1.60)	1.80 (1.52)	1.37 (1.36)	1.07 (1.25)	0.94 (1.20)	0.78 (1.13)	1.32 (1.35)
12	ONS-183	2.13 (1.62)	2.73 (1.80)	2.53 (1.74)	2.93 (1.85)	1.87 (1.53)	1.33 (1.34)	1.09 (1.26)	0.98 (1.21)	1.95 (1.57)
13	JNS-2016-1115	3.00 (1.87)	2.60 (1.76)	2.07 (1.60)	1.34 (1.35)	2.03 (1.58)	1.30 (1.33)	0.97 (1.21)	0.94 (1.20)	1.78 (1.51)
14	NRS-1804	2.40 (1.70)	2.93 (1.85)	3.27 (1.94)	2.33 (1.68)	1.66 (1.47)	2.33 (1.68)	1.17 (1.29)	1.26 (1.32)	2.17 (1.63)
15	DNS-19-24	2.20 (1.64)	1.73 (1.49)	2.33 (1.68)	2.53 (1.74)	1.85 (1.53)	1.30 (1.34)	1.13 (1.27)	1.17 (1.29)	1.78 (1.51)

S. No.	Genotypes	White fly population/three leaves Days after sowing (DAS)								Overall mean
		15	22	29	36	43	50	57	64	
16	NRS-1805	1.27 (1.32)	1.87 (1.53)	2.40 (1.70)	2.26 (1.66)	1.86 (1.54)	1.39 (1.38)	1.26 (1.32)	1.08 (1.26)	1.67 (1.47)
17	JNS-2016-1413	3.13 (1.90)	2.47 (1.72)	1.80 (1.51)	1.67 (1.47)	1.63 (1.45)	1.47 (1.39)	1.40 (1.37)	1.31 (1.34)	1.86 (1.54)
18	NRS-1807	2.53 (1.74)	2.87 (1.82)	2.07 (1.60)	2.47 (1.72)	1.90 (1.54)	1.93 (1.56)	1.36 (1.36)	1.26 (1.32)	2.05 (1.59)
19	JNS-9	1.13 (1.27)	1.60 (1.45)	0.87 (1.60)	1.93 (1.54)	1.73 (1.49)	1.73 (1.49)	1.45 (1.39)	1.00 (1.22)	1.43 (1.38)
20	VNS-1802	3.07 (1.89)	2.67 (1.77)	1.93 (1.56)	1.27 (1.33)	1.62 (1.45)	2.40 (1.69)	1.80 (1.51)	1.15 (1.28)	1.98 (1.57)
21	IGPN-2004-1	2.67 (1.78)	2.67 (1.78)	2.80 (1.82)	2.81 (1.81)	2.28 (1.67)	2.53 (1.74)	1.46 (1.39)	1.03 (1.24)	2.28 (1.67)
SE(m)±		0.05	0.07	0.08	0.09	0.06	0.09	0.07	0.04	0.068
CD at 5%		0.14	0.20	0.22	0.25	0.18	0.25	0.19	0.13	0.195

* Figures in parenthesis are square root transformed value

Table 2. Response of different genotypes of niger against leafhopper

S. NO.	Genotypes	Leafhopper population/three leaves/plant (Days after sowing)								Overall Mean	
		15 DAS	22 DAS	29 DAS	36 DAS	43 DAS	50 DAS	57 DAS	64 DAS		71 DAS
1	JNS-2017-1	0.45 (0.97)	0.81 (1.14)	1.00 (1.22)	0.97 (1.20)	1.03 (1.23)	1.13 (1.27)	1.48 (1.40)	1.30 (1.34)	0.27 (0.87)	0.94 (1.19)
2	NRS-1511	0.46 (1.07)	0.63 (1.05)	0.67 (1.07)	0.96 (1.20)	1.01 (1.22)	1.05 (1.24)	1.29 (1.33)	1.10 (1.26)	0.91 (1.18)	0.90 (1.16)
3	JNS-2017-8	0.60 (1.04)	0.64 (1.06)	0.40 (0.94)	1.03 (1.23)	1.03 (1.23)	1.10 (1.26)	1.16 (1.28)	1.02 (1.22)	0.47 (0.94)	0.83 (1.15)
4	NRS-1513	0.47 (0.97)	0.56 (1.02)	0.80 (1.13)	1.00 (1.22)	1.00 (1.22)	1.13 (1.27)	1.08 (1.26)	0.98 (1.21)	1.01 (1.22)	0.89 (1.18)
5	JNS-2017-13	0.60 (1.04)	0.95 (1.20)	1.19 (1.29)	0.95 (1.20)	1.15 (1.28)	1.06 (1.25)	1.56 (1.43)	1.27 (1.32)	1.10 (1.26)	1.09 (1.26)

S. NO.	Genotypes	Leafhopper population/three leaves/plant (Days after sowing)									Overall Mean
		15 DAS	22 DAS	29 DAS	36 DAS	43 DAS	50 DAS	57 DAS	64 DAS	71 DAS	
6	IGPN-15-02	0.53 (1.01)	0.63 (1.05)	0.68 (1.08)	0.91 (1.18)	0.99 (1.22)	1.02 (1.23)	1.18 (1.29)	1.01 (1.23)	0.80 (1.13)	0.86 (1.17)
7	JNS-2017-17	0.95 (1.20)	0.97 (1.07)	1.26 (1.29)	1.29 (1.33)	1.41 (1.38)	1.68 (1.48)	1.82 (1.52)	1.49 (1.40)	1.20 (1.29)	1.34 (1.36)
8	IGPN-17-02	0.67 (1.07)	0.61 (1.04)	0.70 (1.09)	1.02 (1.23)	1.02 (1.23)	1.23 (1.32)	1.22 (1.31)	1.05 (1.24)	0.87 (1.17)	0.93 (1.19)
9	JNC-6	0.60 (1.04)	0.79 (1.32)	0.83 (1.15)	0.99 (1.22)	1.01 (1.23)	1.07 (1.25)	1.25 (1.32)	1.25 (1.32)	0.89 (1.17)	0.97 (1.21)
10	ONS-182	0.60 (1.04)	0.79 (1.13)	0.80 (1.14)	0.96 (1.20)	1.00 (1.22)	1.31 (1.34)	1.43 (1.39)	1.27 (1.33)	0.95 (1.20)	1.01 (1.23)
11	JNS-28	0.93 (1.19)	0.73 (1.11)	0.99 (1.22)	0.95 (1.20)	0.98 (1.21)	1.31 (1.34)	1.46 (1.40)	1.19 (1.30)	0.98 (1.22)	1.06 (1.25)
12	ONS-183	0.87 (1.16)	0.67 (1.07)	0.73 (1.11)	0.99 (1.22)	1.01 (1.23)	1.29 (1.33)	1.34 (1.35)	1.14 (1.28)	1.21 (1.31)	1.02 (1.24)
13	JNS-2016-1115	0.53 (1.01)	0.67 (1.08)	0.90 (1.18)	1.06 (1.25)	1.06 (1.25)	1.33 (1.35)	1.18 (1.30)	1.06 (1.25)	1.32 (1.34)	1.01 (1.23)
14	NRS-1804	0.86 (1.15)	0.99 (1.22)	1.20 (1.29)	1.36 (1.37)	1.46 (1.40)	1.56 (1.43)	1.68 (1.48)	1.98 (1.57)	1.49 (1.40)	1.40 (1.38)
15	DNS-19-24	0.76 (1.12)	0.93 (1.20)	1.31 (1.34)	1.56 (1.43)	1.80 (1.52)	1.92 (1.56)	1.53 (1.43)	1.30 (1.34)	1.41 (1.38)	1.39 (1.37)
16	NRS-1805	0.67 (1.06)	0.60 (1.04)	0.60 (1.04)	1.03 (1.24)	1.03 (1.24)	1.22 (1.31)	1.21 (1.30)	1.14 (1.28)	1.15 (1.27)	0.96 (1.21)
17	JNS-2016-1413	0.93 (1.17)	1.29 (1.33)	1.46 (1.02)	1.73 (1.49)	2.03 (1.58)	2.33 (1.68)	2.07 (1.60)	1.63 (1.45)	1.45 (1.22)	1.68 (1.48)
18	NRS-1807	0.80 (1.14)	0.93 (1.20)	0.46 (0.98)	1.04 (1.24)	1.04 (1.24)	1.27 (1.33)	1.20 (1.30)	1.19 (1.30)	1.07 (1.25)	1.00 (1.22)
19	JNS-9	0.47 (1.03)	0.85 (1.12)	0.60 (0.96)	1.02 (1.19)	1.02 (1.19)	1.34 (1.26)	1.10 (1.22)	1.03 (1.20)	1.09 (1.18)	0.95 (1.20)
20	VNS-1802	0.67 (1.07)	0.61 (1.05)	0.82 (1.15)	0.98 (1.21)	1.00 (1.22)	1.27 (1.33)	1.36 (1.36)	1.19 (1.30)	0.87 (1.17)	0.98 (1.21)

S. NO.	Genotypes	Leafhopper population/three leaves/plant (Days after sowing)									Overall Mean
		15 DAS	22 DAS	29 DAS	36 DAS	43 DAS	50 DAS	57 DAS	64 DAS	71 DAS	
21	IGPN-2004-1	0.80 (1.14)	0.83 (1.15)	1.34 (1.35)	1.93 (1.56)	2.07 (1.60)	1.93 (1.56)	1.88 (1.54)	1.54 (1.42)	0.96 (1.21)	1.48 (1.41)
	SE(m)±	0.08	0.06	0.07	0.03	0.04	0.06	0.05	0.05	0.06	0.05
	CD	0.22	0.17	0.19	0.09	0.10	0.18	0.16	0.13	0.18	0.15

* Figures in parenthesis are square root transformed value

Table 3. Response of different genotypes of niger against capsule fly

S. No.	Genotypes	Capsule fly population/plant (Days after sowing)				Overall mean
		45	52	59	66	
1	JNS-2017-1	2.80 (1.80)	3.01 (1.87)	2.69 (1.78)	1.82 (1.52)	2.58 (1.75)
2	NRS-1511	2.67 (1.78)	1.70 (1.48)	2.01 (1.58)	1.29 (1.33)	1.92 (1.56)
3	JNS-2017-8	1.40 (1.37)	1.20 (1.33)	1.28 (1.37)	1.21 (1.28)	1.32 (1.34)
4	NRS-1513	1.74 (1.49)	1.20 (1.30)	1.28 (1.27)	1.21 (1.30)	1.36 (1.36)
5	JNS-2017-13	2.60 (1.76)	2.53 (1.74)	1.90 (1.53)	1.25 (1.31)	2.07 (1.60)
6	IGPN-15-02	1.74 (1.49)	1.40 (1.38)	1.48 (1.36)	1.37 (1.37)	1.50 (1.41)
7	JNS-2017-17	3.20 (1.92)	1.33 (1.34)	1.82 (1.50)	1.32 (1.34)	1.92 (1.55)
8	IGPN-17-02	1.74 (1.49)	1.27 (1.32)	1.49 (1.40)	1.37 (1.36)	1.46 (1.40)
9	JNC-6	1.74 (1.49)	2.33 (1.68)	1.79 (1.50)	1.36 (1.36)	1.80 (1.52)
10	ONS-182	1.26 (1.32)	1.45 (1.39)	1.98 (1.57)	1.34 (1.35)	1.50 (1.41)
11	JNS-28	2.40 (1.70)	1.20 (1.30)	2.07 (1.59)	1.11 (1.26)	1.69 (1.48)
12	ONS-183	1.54 (1.40)	1.42 (1.38)	1.75 (1.47)	1.22 (1.30)	1.48 (1.41)
13	JNS-2016-1115	1.00 (1.22)	1.26 (1.32)	1.94 (1.55)	1.17 (1.29)	1.34 (1.35)
14	NRS-1804	1.73 (1.49)	2.13 (1.62)	1.81 (1.50)	1.34 (1.35)	1.75 (1.50)
15	DNS-19-24	1.13 (1.27)	1.01 (1.23)	1.28 (1.33)	1.02 (1.23)	1.11 (1.27)
16	NRS-1805	2.40 (1.70)	1.34 (1.34)	1.26 (1.32)	1.04 (1.24)	1.51 (1.42)
17	JNS-2016-1413	1.46 (1.39)	1.65 (1.47)	1.55 (1.43)	1.28 (1.33)	1.49 (1.41)
18	NRS-1807	1.73 (1.49)	1.25 (1.32)	1.42 (1.39)	1.16 (1.18)	1.39 (1.37)
19	JNS-9	2.80 (1.81)	2.40 (1.70)	1.34 (1.35)	1.06 (1.17)	1.90 (1.55)
20	VNS-1802	1.34 (1.35)	1.81 (1.52)	1.63 (1.45)	1.97 (1.57)	1.69 (1.48)
21	IGPN-2004-1	2.46 (1.72)	1.98 (1.58)	1.46 (1.41)	1.54 (1.42)	1.86 (1.54)
	SE(m)±	0.08	0.05	0.10	0.06	0.07
	CD at 5%	0.22	0.15	0.29	0.18	0.21

* Figures in parenthesis are square root transformed value

received from the genotype JNS-2017-1 followed by (2.29 whitefly/three leaves) NRS-1511 and IGPN-2004-1 (2.28 whitefly/three leaves). The genotypes JNS-28, JNS-9, JNC-6, NRS-1805, IGPN-15-02, NRS-1513, JNS-2016-1115, DNS-19-24, IGPN-17-02 and JNS-2016-1413 were found at par to each other in respect to record the lowest population of whitefly. Present findings are in conformity with the findings of Tembhe [34], they screened 78 germplasm lines of niger for resistance/susceptibility against major insect pests and reported that the entry N-KEC-7 was found highly susceptible against *B. tabaci*. Present findings are also supported by the findings of Ranganatha et al. [35] they reported that the genotype N-6 and N-11 were found to be tolerant against whitefly.

3.1 Leafhopper (*Amrasca* sp.)

Among the screened genotypes the lowest population of leafhopper (0.83 leafhopper/three leaves) was recorded from the genotype JNS-2017-8 followed by (0.86 leafhopper/three leaves) IGPN-15-02 and (0.89 leafhopper/three leaves) NRS-1513. Among the screened genotype the highest population of leafhopper (1.68 leafhopper/three leaves) was received from the genotype JNS-2016-1413 followed by (1.48 leafhopper/three leaves) IGPN-2004-1 and (1.40 leafhopper/three leaves) NRS-1804. The genotypes JNS-2017-8, IGPN-15-02, NRS-1513, NRS-1511, JNS-2017-1, JNS-2017-13, IGPN-17-02, JNC-6, ONS-182, JNS-28, NRS-1805, NRS-1807, JNS-9 and VNS-1802 were found at par to each other in respect to record the leafhopper population/three leaves. Similarity the genotypes JNS-2016-1413, DNS-19-24, NRS-1804, JNS-2017-17 and IGPN-2004-1 were also found at par to each other in respect to record the leafhopper population/three leaves.

3.2 Capsule Fly

The results of average population data of capsule fly revealed that all the genotypes were differed to each other in respect to record the capsule fly population per plant. Among the screened genotypes the lowest population of capsule fly (1.11 adult /plant) was recorded from the genotype DNS-19-24 followed by (1.32 capsule fly/plant) JNS-2017-8 and JNS-2016-1115 (1.34 capsule fly/ plant). Among the screened genotype the highest population of capsule fly (2.58 capsule fly/plant) was received from the genotype JNS-2017-1 followed by (2.07 capsule fly/plant) JNS-2017-13 and NRS-1511 (1.92 capsule fly/plant), JNS-2017-17 (1.92

capsule fly/plant).The genotypes DNS-19-24, JNS-2017-8, JNS-2016-1115, NRS-1513, NRS-1807, JNS-2016-1413, ONS-182, ONS-183, IGPN-15-02, NRS-1805 and IGPN-17-02 were found at par to each other in respect to record the lowest population of capsule fly. Similarly the genotype JNS-2017-1, JNS-2017-17, NRS-1511, JNS-2017-17, JNS-9 and IGPN-2004-1, were found at par to each other in respect to record the population of capsule fly.

4. CONCLUSIONS

The 21 promising genotypes of Niger were screened for resistance/susceptibility against whiteflies, leafhoppers, and capsule fly. It is assessed that the genotypes JNS-28, JNS-9, JNC-6, NRS-1805, IGPN-15-02 and NRS-1513 were found promising against whitefly. The genotypes JNS-2017-8, IGPN-15-02, NRS-1513, NRS-1511 and JNS-2017-1 were found promising against the incidence of leafhopper. The genotypes DNS-19-24, JNS-2017-8, NS-2016-1115, NRS-1513 and NRS-1807 were found promising against capsule fly. It has been concluded that JNS-2017-1 genotype is highly resistant to whitefly and capsule fly and JNS-2016-1413 was resistant to Leafhopper. JNS-28, JNS-2017-8, DNS-19-20 were susceptible genotype with respect to whitefly, leafhopper and capsule fly.

CONFERENCE DISCLAIMER

Some part of this manuscript was previously presented in the conference: 6th International Conference on Strategies and Challenges in Agricultural and Life Science for Food Security and Sustainable Environment (SCALFE-2023) on April 28-30, 2023 in Himachal Pradesh University, Summer Hill, Shimla, HP, India. Web Link of the proceeding: <https://www.shobhituniversity.ac.in/pdf/Souvenir-Abstract%20Book-Shimla-HP-SCALFE-2023.pdf>

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Saleem M, Hassan WM and Jamil M. Screening of sunflower (*Helianthus annuus* L.) varieties against insect pests, predators' populations, and their yield comparison under semi-arid climatic

- conditions. Journal of Entomology and Zoology Studies. 2017;5(3):1219-1225.
2. Saxena RN. Screening of promising germplasm lines of niger (*Guizotia abyssinica* Cass.) against the major insect pests. M.Sc. (Agri.) Thesis submitted to JNKVV, Jabalpur. 200;1-6.
 3. Shaikh AA, Patel DR, Patel JJ. Screening of different genotypes/cultivars against sucking pests infesting brinjal, AGRES – An International e-Journal. 2013;2(1):51-57.
 4. Shrinivasan S, Yuvaraja B. In Incidence of *Prospalta capensis* Gn. and its natural enemies on safflower Insect Environment. 2004;10(3):115-116.
 5. Shrivastava N. Insect pest of niger and their integrated management. Proceeding of workshop cum Seminar on niger production technology held at ZARS, Chhindwara (M.P.) during 28th Sept.- 1st Oct. 1995 44-50.
 6. Panday AK, Sharma S, Bisen R, Jain S, Malviya M, Ranganatha ARG. Niger improvement : Current status and future strategies. J. Oilseed Res. 2014;31(2):95-113.
 7. Chatterjee PM, Shanowly, Das Ayan. Screening of Different Genotypes of okra (*Abelmoschus esculentus* L.) against Leafhopper (*Ammurca biguttula biguttula* L.) and Whitefly (*Bemisia tabaci* G.) under New Gangetic Alluvial Zone of West Bengal, International Journal of Current and Applied Sciences. 2019;8(3):1087-1095.
 8. Chauhan RS, Sharma AK, Kamal R, Ali A. Screening of mungbean (*Vigna radiata* L.) germplasm against major sucking pest. Journal of Pharmacognosy and Phytochemistry. 2018;7(5):1784-1787.
 9. Das P, Khandwe N. Screening of niger varieties against major pest in Satpura plateau of Madhya Pradesh. National seminar on strategies for enhancing production and expert of Sesame and Niger, April 7th and 8th, Agri. Res. Station, RAU Mandor, Jodhpur (Rajasthan). 2005; 49.
 10. Ganguly J, Ganguly RN, Vaishampayan SM, Verma R. Identity of the migratory phase of cabbage semilooper on the basis of reproductive development and Fat body content. Journal Advancement Zoology. 1989;10 (2): 88- 94.
 11. Hooda VS. Dhankhar BS, Singh Ram. Evaluation of okra cultivars for field resistance to the leafhopper *Ammurca biguttula biguttula* (Ishida), International Journal of Tropical Insect Science. 2011; 17(4):323–327.
 12. Jahangir AH, Muhammad W, Jamil M. Screening of okra genotypes (*Abelmoschus esculentus* L.) against jassid (*Ammurca biguttula biguttula* Ishida) under agro-climatic conditions of Bahawalpur, Pakistan. ARPN Journal of Agricultural and Biological Science. 2017; 12(12):352-359.
 13. Narayanan, ES. Insect pest of niger and methods of their control in niger and safflower in Karnataka. 1961;6(7):119-120.
 14. Navneet, Tayde, AR. Screening of okra genotypes against white fly [*Bemisia tabaci* (Gennadius)] and YVM Virus. Journal of Entomology and Zoology Studies. 2018; 6(1):565-568.
 15. Acharya VS, Singh AP. Screening of cotton genotypes against whitefly, *Bemisia tabaci* Genn. Journal of Cotton Research and Development. 2007;21(1):111-114.
 16. Anonymous. Niger technology for maximizing production. All India coordinated research project on sesame and niger (ICAR), JNKVV Campus, Jabalpur (M.P). 2014;1-4.
 17. Bulcha W. *Guizotia abyssinica* (L.f.) Cass. Record from PROTA (Plant Resources of Tropical Africa), Wageningen, Netherlands. 2007;24.
 18. Cemal K. Screening of Turkish sesame (*Sesamum indicum* L.) landraces for whitefly and lodging resistance. International gap agriculture & livestock congress. Turkey. 25-27 April 2018;45.
 19. Chakravati BN. Niger seed (*Guizotia abyssinica* Cass) as they rainy season host plant of *Perigea capensis* Gn, Indian Journal Entomology. 1947;10:129-130.
 20. Shah SJ, Khan SB, Zulfiquar Ali, Shah Sajid Ali, Ullah A, Bakhsh K, et al. Screening of mustard varieties against sucking insect pests of mustard. Pure and Applied Biology. 2020;9(2):1522-1533.
 21. Vles RO, Gottenbos JJ. Nutritional characteristics and food uses of vegetable oils. Oil Crops of the World, McGraw-Hill Publishing Company, New York. 1989;63-86.
 22. Yadav, Amrita. To study the succession, population dynamics and estimate avoidable yield losses caused by insect

- pests in Niger crop. M.Sc. (Agri) Thesis., JNKVV, Jabalpur. 2017;1-9.
23. Misal D, Vaibhav, Davane SS, Mane BS. Improvement of yield in *Guizotia abyssinica* (L.F.) Cass. by using backcross method. World Journal of Advanced Research and Reviews. 2021;12(02):261–266.
DOI:<https://doi.org/10.30574/wjarr.2021.12.2.0579>. 2021
24. Panday AK, Bisen R, Jain S, Sahu R. Effect of climatic factors on population intensity of insect pests damaging niger crop. XIX International Plant Protection Congress IPPC 2019 Hyderabad, Telangana. 2019;278.
25. Patil HS, Ranganatha ARG, Paroha S, Tripathi A. Niger [*Guizotia abyssinica* (L.f.) Cass.]. In: Breeding of Field Crop. Agrobios (India), Jodhpur. 2012; 567-587.
26. Rai BK. Pests of oilseed crops in India and their control. Publ. Indian Council Agricultural Research, New Delhi. 1976;121.
27. Rai HS, Tiwari RC. Screening of Niger germplasm lines against niger capsule fly (*Dioxya sororcula* Weid). Geobios. 1995;22(4):174-176.
28. Rai HS. Pest complex of niger (*Guizotia abyssinica* Cass) and screening of its available germplasm against major pests. M.Sc. (Agri.) Thesis submitted to JNKVV, Jabalpur. India. 1984;120.
29. Ranganatha ARG. Strategies for Sesame and Niger Developmental Programmes in India. Paper presented in DAC-GOI review, New Delhi. The Indian Society of Oilseeds Research. 2009;32(2):95-193.
30. Mandloi I. To study the effect of different dates of sowing on the incidence of major pests of niger. M. sc. Thesis, JNKVV, Jabalpur. 2020;1-75.
31. Manivannan A, Philip RS, Karthikeyan S, Pillai AK. Screening of cotton genotypes against leafhopper, *Amrasca biguttula biguttula* (Ishida) (Homoptera: Cicadellidae), Journal of Entomology and Zoology Studies. 2017;5(6):1305-1310.
32. Moorie AO, Sequeria RV, Woodger TA. Susceptibility of crop plants to *Bemisia tabaci* (Gennadins) B-biotype (Hemiptera, Aleyrodidae) in control. Queensland australian Entomologist. 2004;31(2):69-74.
33. Nagaraj G, Patil HS. Quality and oil composition of Niger (*Guizotia abyssinica* L. f. Cass). A Review. J. Oilseed Res. 2004;21(2):224-229.
34. Tembhre H. Screening of germplasm of niger (*Guizotiaa byssinica* Cass.) against the major insect pests. M.Sc. (Agri.) Thesis submitted to JNKVV, Jabalpur. 2005;1-85.
35. Ranganatha ARG, Panday AK Bisen R. Jain S, Sharma Shikha. Breeding Oilseed Crops for Sustainable Production. 2016; 169-199.
DOI: 10.1016/B978-0-12-801309-0.00008-2

© 2023 Vishwakarma et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:
<https://www.sdiarticle5.com/review-history/103499>