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Field screening of cucumber (*Cucumis sativus* L.) cultivars against fruit fly (*Bactrocera cucurbitae* Coq.)

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Abstract
Field experiment was conducted at Farm, college of horticulture, Mandsaur during summer season of 2020-21 and 2021-22, to determine the varietal resistance of cucumber (*Cucumis sativus* L.) against the infestation of fruit fly *Bactrocera cucurbitae* in randomized block design with three replications and one meter plant spacing. Ten cucumber hybrids *viz*., Hybrid Cucumber EZ15-W-08, Cucumber Super Green, SAIRA-934, Cucumber Green Long(S-82), Saloni, Punheri, Cucumber Green Gold-7 (standard check), Jannat, Gen-2215 and Cucumber Gautam-910 were screened against fruit fly. Observations on fruit fly infestation were recorded from 15th to 20th SMW weekly in fruiting stage of crop during both the years on the basis of total number of fruits and damaged fruits. Based on two years pooled mean, variety SAIRA-934 (10.50%) was considered highly resistant, Saloni (14.60%)> Cucumber Green Long(S-82) (13.98%)> Cucumber Green Gold-7 (12.62%) were resistant and Cucumber Super Green (29.52%)> Punheri (28.56%)> Cucumber Gautam-910 (28.46%)> Hybrid Cucumber EZ15-W-08 (27.65%)> Jannat (26.86%)> Gen-2215 (25.27%)were categorized as moderately resistant varieties.

Keywords: Cucumber, infestation, fruit fly, resistance, cultivar

Introduction
Cucumber (*Cucumis sativus* L.) is a popular and widely grown vegetable all over the country, reported to have originated in India. It is one of the quickest maturing vine vegetable crops and is the second most widely cultivated cucurbit after watermelon. It is grown in high-temperature, humidity and light-intensity environment, requires frequent irrigation along with constant nutrients supply. In relation to nutritional value it contains Moisture (96.3%), Protein (0.4 g), Fat (0.1 g), Minerals (0.3 g), Fiber (0.4 g), Carbohydrate (2.5 g), Calcium (10 mg), Phosphorus (25 mg), Iron (1.5 mg), Thiamine (0.03 mg), Niacin (0.2 mg), Vitamin-C (7 mg) and Energy (13 Kcal) in 100 g of its edible part (Rai and Yadav, 2005) [5].
Cucumber fruit fly (*Bactrocera cucurbitae* Coquillett) is one of the most serious pest that limits the production and productivity of cucumber. It is also known as melon fly and melon fruit fly and belonging to family Tephritidae of order Diptera, is the most important pest of cucurbitaceous crops. The extent of damage due to fruit flies varies between 30 to 100% depending upon the season and susceptibility of the crops species and varieties. It prefers to infest young, soft skinned ovaries even before anthesis. When the humidity is high, intensity of cucurbit fruit fly damage becomes severe. (Dhillion *et al*. 2005) [3]. A number of new hybrids of cucumber are available in the market with higher fruit yield performance. The experiment was planned to screen these easily available hybrids against fruit fly infestation.

Materials and Methods
The experiment was carried out at Farm, college of horticulture, Mandsaur during summer season of 2020-21 and 2021-22, to determine the performance of various cucumber (*Cucumis sativus* L.) hybrids against the infestation of fruit fly *Bactrocera cucurbitae*in randomized block design with three replications and one meter plant to plant and row to row spacing in 5x3 M^2 plot size. Ten cucumber hybrids *viz*., Hybrid Cucumber EZ15-W-08, Cucumber Super Green, SAIRA-934, Cucumber Green Long(S-82), Saloni, Punheri, Cucumber Green Gold-7 (standard check), Jannat, Gen-2215 and Cucumber Gautam-910 were sown on 5th February, 2020 and 9th February, 2021. Observations on fruit fly infestation were recorded from 15th to 20th SMW weekly in fruiting stage of crop during both the years on the basis of total number of fruits and damaged fruits. The resistance/susceptibility for cultivars were judged on the basis of percent fruit infestation. The cumulative percent fruit infestation was worked out on the basis of total number of fruit from all the pickings as given below:

$$\text{Percent fruit infestation} = \frac{\text{Total no. of infested fruit}}{\text{Total no. of fruits}} \times 100$$

The cultivars screened under field condition were grouped in to different categories on the basis of percent infested fruits in each cultivar (Nath, 1966) [4]. The data was analyzed statistically and presented in table.

Susceptibility rating scale of the genotypes on the basis of percent fruit damage:

Scale	Percent fruit damage	Rating
1	No damage	Immune
2	1-10	Highly resistance
3	11-20	Resistance
4	21-50	Moderately resistance
5	51-75	Susceptible
6	76-100	Highly Susceptible

Result and Discussion

The pooled data (Table: 1 and Fig: 1) revealed that in first observation (15th SMW) the fruit fly infestation was observed on all the varieties. The incidence of fruit fly commenced from the 15th SMW on all the varieties, ranged from 9.80to 25.93 percent. The lowest infestation was recorded in cultivar SAIRA-934 (9.80%) and maximum infestation was observed in Cucumber Super Green (25.93%). The infestation recorded in descending order was Cucumber Super Green (25.93%)> Punheri (24.38%)> Cucumber Gautam-910 (24.11%)> Hybrid Cucumber EZ15-W-08 (23.81%)> Jannat (22.93%)> Gen-2215 (19.38%)> Saloni (13.96%)> Cucumber Green Long(S-82) (12.89%)> Cucumber Green Gold-7 (11.68%)> SAIRA-934 (9.80%), respectively.

The infestation increased slowly in all the hybrids in 16th and 17th SMW. The peak population was recorded in the 18th SMW on all the varieties, ranged from 13.05 to 33.33percent. The minimum infestation was observed on SAIRA-934 (13.05%), and maximum in Cucumber Super Green (33.33%). The infestation recorded in descending order was in Cucumber Super Green (33.33%)> Punheri (33.09%)> Cucumber Gautam-910 (32.61%)>Hybrid Cucumber EZ15-W-08 (32.25%)> Jannat (31.49%)> Gen-2215 (31.46%)> Saloni (16.48%)> Cucumber Green Long(S-82) (16.00%)> Cucumber Green Gold-7 (14.54%)> SAIRA-934 (13.05%), respectively.

The data on the basis of overall mean of all the observations, fruit fly indicated that the infestation was in range of 10.50to 29.52 percent. The minimum infestation was recorded in variety SAIRA-934 (10.50%). and the highest mean infestation was recorded in variety Cucumber Super Green (29.52%). The mean infestation recorded in remaining varieties in descending order was Cucumber Super Green (29.52%)> Punheri (28.56%)> Cucumber Gautam-910 (28.46%)> Hybrid Cucumber EZ15-W-08 (27.65%)> Jannat (26.86%)> Gen-2215 (25.27%)> Saloni (14.60%)> Cucumber Green Long(S-82) (13.98%)> Cucumber Green Gold-7 (12.62%)> SAIRA-934 (10.50%),respectively. Further in 19th and 20th SMW infestation slightly decreased.

Taking the Susceptibility rating scale into account variety SAIRA-934 showed lowest infestation (10.50%), was highly resistant and Saloni (14.60%)> Cucumber Green Long(S-82) (13.98%)>and Cucumber Green Gold-7 (12.62%) were resistant while, Cucumber Super Green (29.52%)> Punheri (28.56%)> Cucumber Gautam-910 (28.46%)> Hybrid Cucumber EZ15-W-08 (27.65%)> Jannat (26.86%)>and Gen-2215 (25.27%)were categorized as moderately resistant varieties.Present finding concurrence with Shinde *et. al* (2018) [6] who screened fifteen cucumber cultivars against fruit flies (*Diptera*: *Tepheritidae*) and none of cultivar found to be resistant. During fruiting stage the highest (48.39 ± 10.67) mean percent fruit flies infestation was recorded in cultivar Sheetal followed by AAUC-3 (47.03%), CHC-1 (44.58%), PCUCH-7 (44.05). The minimum (19.11± 10.67) mean percent fruit flies infestation was observed in cultivar Pusa Sanyog. Devaraju (2018) [2] screened the performance of twenty different genotypes of ridge gourd against melon fruit fly under field conditions, where the eleven genotypes such as UHSBRG-5, UHSBRG-15, UHSBRG-12, UHSBRG-18, UHSBRG-19, UHSBRG-17, UHSBRG-9, UHSBRG-1, UHSBRG-6, UHSBRG-16 and UHSBRG-13 were classified under resistant category, and the genotypes such as UHSBRG-3, UHSBRG-4, UHSBRG-2, UHSBRG-14, UHSBRG-8, UHSBRG-20 and UHSBRG-7 were categorized as moderately resistant genotypes and UHSBRG-11 and UHSBRG-10 were classified as susceptible genotypes for fruit fly infestation. Anant *et al*. (2020) [1] screened Seventeen genotypes of spine gourd against cucurbit fruit fly (*Bactrocera cucurbitae*) under natural field conditions. Among all, none of genotype was free from fruit fly infestation. Only the genotype Indira Kankoda (IK-1) was recorded as "resistant" showing 16.30 and 17.43 percent fruit infestation (on fruit number and weight basis). However, the genotype RMF-7-P-1 was assigned as "susceptible" with 51.06 and 53.00 percent infestation respectively.

Screening of newly evolve genotypes against insect pests, is a continuous process as every year a number of varieties come in the market and after few years, new varieties replace them due to their better performance. Therefore, comparison with previous findings in relation to varietal performance always do not match.

Table 1: Screening of various hybrids against Cucumber Fruit fly during Summer Season, 2020-21 & 2021-22. (Pooled)

S. No.	Varieties	Fruit fly infestation at weekly interval(SMW)						Mean *
		15th	16th	17th	18th**	19th	20th	
V_1	Hybrid Cucumber EZ15-W-08	23.81 (29.53)	25.38 (30.46)	31.68 (34.49)	32.25 (34.74)	31.00 (34.07)	26.78 (31.44)	27.65 (32.20)
V_2	Cucumber Super Green	25.93 (30.81)	27.81 (32.05)	32.67 (34.43)	33.33 (35.48)	28.97 (32.71)	23.71 (29.38)	29.52 (32.46)
V_3	SAIRA-934	9.80 (16.04)	10.30 (18.10)	11.21 (22.29)	13.05 (21.53)	10.52 (18.98)	9.34 (17.83)	10.50 (20.13)
V_4	Cucumber Green Long(S-82)	12.89 (21.41)	14.52 (22.74)	15.66 (23.60)	16.00 (23.83)	13.69 (22.10)	11.10 (19.88)	13.98 (22.26)
V_5	Saloni	13.96 (22.32)	15.53 (23.53)	16.24 (24.02)	16.48 (24.24)	14.16 (22.48)	11.23 (19.93)	14.60 (22.75)

V_6	Punheri	24.38 (29.84)	25.79 (30.66)	28.45 (32.46)	33.09 (35.32)	28.78 (32.63)	22.92 (28.84)	28.56 (32.35)
V_7	Cucumber Green Gold-7	11.68 (20.41)	12.74 (21.28)	14.50 (22.67)	14.54 (22.78)	11.81 (20.42)	10.44 (19.24)	12.62 (21.13)
V_8	Jannat	22.93 (28.82)	21.94 (28.19)	28.62 (32.56)	31.49 (34.02)	27.17 (31.57)	23.14 (28.94)	26.86 (31.36)
V_9	Gen-2215	20.38 (27.09)	25.77 (30.79)	31.12 (34.12)	31.46 (33.59)	29.22 (32.88)	25.26 (30.41)	25.27 (30.32)
V_{10}	Cucumber Gautam-910	24.11 (29.53)	25.94 (30.83)	31.80 (34.61)	32.61 (35.11)	28.95 (32.86)	24.55 (29.97)	28.46 (32.17)
	S.Em±	1.62	1.63	1.76	1.83	1.81	1.59	1.70
	CD at 5%	4.80	4.84	5.21	5.45	5.39	4.72	5.07
	CV %	10.81	10.42	10.30	10.54	11.14	10.71	10.65

* Mean of three replications, Figures in the parentheses are angular transformed values, **Peak infestation of fruit fly

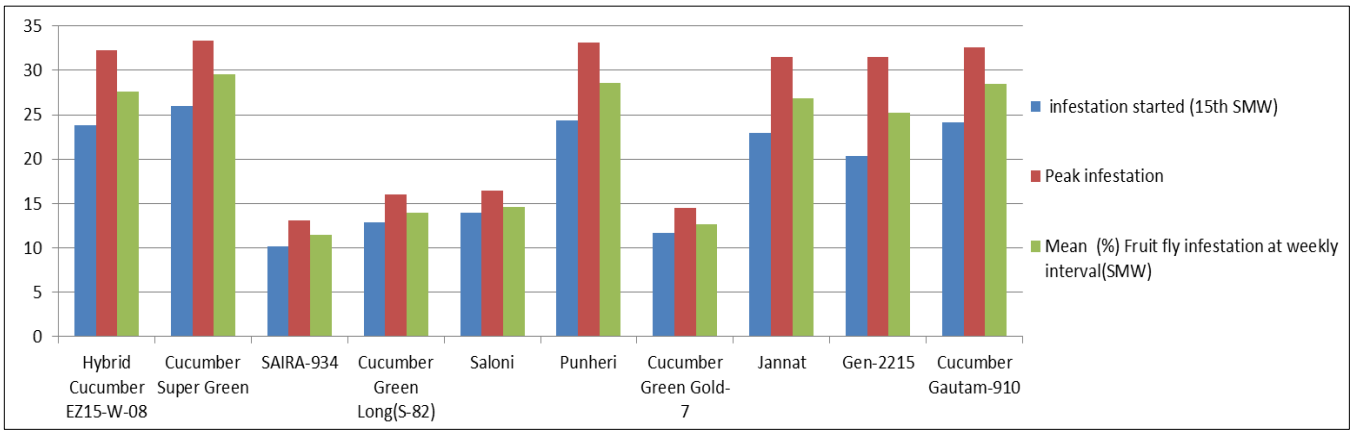

Fig 1: Screening of various hybrids against Cucumber Fruit fly during Summer Season, 2020-21 & 2021-22. (Pooled)

Conclusion

Ten cultivar of cucumber were screened against cucumber fruit fly (*Bactrocera cucurbitae*) under natural field conditions. The result revealed that none of genotype was found free from fruit fly infestation. Only one genotype *i.e*SAIRA-934 (10.50%) was highly resistant and Saloni (14.60%)> Cucumber Green Long(S-82) (13.98%)> Cucumber Green Gold-7 (12.62%) were resistance while, Cucumber Super Green (29.52%)> Punheri (28.56%)> Cucumber Gautam-910 (28.46%)> Hybrid Cucumber EZ15-W-08 (27.65%)> Jannat (26.86%)> Gen-2215 (25.27%)were moderately resistant varieties.

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References

1. Anant Priti, Vivek Kumar Sandilya, Painkra KL. Screening of different genotypes of spine gourd (*Momordica dioica* Roxb.) against fruit fly in northern hilly region of Chhattisgarh. International J of Chemical Stu. 2020;8(3):1174-1179.
2. Devaraju G, Narabenchi GB, Shruthi CR, Nadaf AM. Screening of ridge gourd genotypes aganist melon fruit fly, *Bactrocera cucurbitae* (Coquillett) under field conditions. J of Ento. and Zoology Stu. 2018;6(4):814-817.
3. Dhillon MK, Singh R, Naresh JS, Sharma HC. The melon fruit fly, *Bactrocera cucurbitae*: A review of its biology and management. J of Insect Sci. 2005;5(40):1-15.
4. Nath P. Varietal resistance of gourds to the fruit flies. Indian J Hort. 1966;23(2):69-79.
5. Rai N, Yadav DS. Advances in Vegetables Production; c2005. p. 344-356.
6. Shinde PB, Naik KV, Jalgaonkar VN, Shinde BD, Golvankar GM. Screening of Some Promising cucumber cultivars against Fruit Flies (Diptera: Tephritidae). Trends in Biosci. 2018;11(37):396-397.