International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Impact Factor (2012): 3.358

Categorization of Rose Varieties Against Thrips, *Frankliniella occidentalis* Pergande

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Abstract: ***A field experiment was conducted during 2012-13 at Botanical Garden and Nursery, Motibaug, College of Agriculture, JAU, Junagadh to categorization of the ten rose varieties against the rose thrips, Frankliniella occidentalis Pergande. The study revealed that varieties Basrai and Paradise were categorized as highly resistant against thrips. The variety Lemon sarbat was found resistant to the thrips. The varieties Eiffel tower, Summer holiday and Devine were categorized as susceptible to the thrips. While, Ice red and Miniature were found highly susceptible to the thrips. The correlation coefficient study between leaf colour and thrips population revealed that there was a positive and significant relationship (r = 0.602) between leaf colour and thrips population. With the increase in intensity of green colour in leaf, the thrips population also increased.***

Keywords: Categorization, Rose, Thrips and *Frankliniella occidentalis*

1. Introduction

Rose belongs to the family Rosaceae. The genus *Rosa* consists of about 120 species out of which only eight species are cultivated. Rose is one of the nature's beautiful creations and is universally called as 'Queen of flower'. Among the flowers, rose occupies an area of about 4106 hectare with a production of 32,135 MT/ha with the productivity of 7.83 MT/ha in Gujarat (Anon., 2012). Rose is used for worship in making garlands and bouquets (Bose and Yadav, 1989). In field condition, rose is highly susceptible to sucking pests. Among them, the rose thrips or western flower thrips, *Frankliniella occidentalis* (Pergande) [Thripidae: Thysanoptera] is a serious problem on rose grown under protected cultivation. Damaged flowers get discoloured and distorted in shape and reduced in size (Jhansi Rani and Jagan Mohan, 1997). Gahukar (2003) reported that this pest can cause 28-95 percent damage with a population density of 11-33 thrips/flower. At present time, chemical control is expensive and at times more applications may be required for the control of thrips. Therefore, the present study was carried out to identify the resistant and susceptible varieties of rose for further cultivation programme.

2. Materials and Methods

Present investigation on categorization of different varieties of rose against the thrips, *Frankliniella occidentalis* under field condition was carried out at Botanical Garden & Nursery, Motibaug, College of Agriculture, JAU, Junagadh in 2012-13. Ten varieties of rose were selected in the field for the study on susceptibility against the thrips. The experiment was laid out in randomized complete block design (RBD) with each of the variety as treatment and it was replicated thrice for recording observations, two plants were selected randomly from each replication.

Table 1: Different varieties of rose

1	Ice Red	6	Summer holiday
2	Miniature	7	Dilkhush
3	Devine	8	Eiffel tower
4	Paradise	9	Red farida
5	Lemon sarbat	10	Basrai

The populations of thrips were recorded at weekly intervals from each plant. The mean of thrips population were taken from weekly observation during the season. The different rose varieties were categorized into highly resistant (HR), resistant (R), susceptible (S) and highly susceptible (HS) to *F. occidentalis*. For the purpose, mean value of individual varieties ($\bar{x}_i$) was compared with mean value of all varieties ($\bar{x}$) and standard deviation (sd) following the modified scale adopted by Patel *et al*. (2002). The retransformed data was used for computation of $\overline{X}$, $\overline{X}_i$ and sd for the each parameter. The scale used for categorizing of different varieties was as under.

Table 2: Categorization of varieties

Category of resistance	Scale for resistance
Highly resistant (HR)	$\overline{X}_i < \overline{X}$ - sd
Resistant (R)	$\overline{X}_i > \overline{X}$ - sd < $\overline{X}$
Susceptible (S)	$\overline{X}_i > \overline{X} < (\overline{X}$ + sd)
Highly susceptible (HS)	$\overline{X}_i > (\overline{X}$ + sd) < $\overline{X}$ + 2 sd)

For the study of influence of leaf colour of rose on thrips, visual observation was made on leaf colour of different varieties and categorized as light green, green and dark green. Further, they were graded as one for light green, two for green and three for dark green to facilitate statistical analysis. Correlation coefficient was calculated between leaf colour of rose and the population of thrips.

3. Results and Discussion

The results of categorization of rose varieties for their susceptibility to thrips, *F. occidentalis* (Table 3 & 4) indicated that varieties Basrai and Paradise were found highly resistant as the thrips population was less than 1.39 thrips per leaflet and 3.57 thrips per flower. While, Lemon sarbat was categorized under resistant due to the thrips population were recorded less than 1.97 thrips per leaflet and 6.59 thrips per flower but more than the highly resistant values.

However, Summer holiday, Eiffel tower and Devine had less than 2.55 thrips per leaflet but more than 1.97 thrips per leaflet. Where in case of flower, these varieties had less than 9.61 thrips per flower but more than 6.59 thrips per flower and they were found as susceptible varieties. While, Icered and Miniature with more than 2.55 thrips per leaflet and 9.61 thrips per flower were found highly susceptible varieties.

Table 3: Categorization of rose varieties for their susceptibility to thrips, *F. occidentalis* based on population on leaflet

Category of resistant	Scale $\overline{X}$ = 1.97 sd = 0.58	Varieties ($\overline{X_i}$)
Highly resistant (HR)	$\overline{X_i}$ < 1.39	Basrai (1.21) Paradise (1.28)
Resistant (R)	$\overline{X_i}$ > 1.39 < 1.97	Red farida (1.46) Lemon sarbat (1.62) Dilkhush (1.79)
Susceptible (S)	$\overline{X_i}$ > 1.97 < 2.55	Summer holiday (2.13) Eiffel tower (2.24) Devine (2.46)
Highly susceptible (HS)	$\overline{X_i}$ > 2.55 < 3.13	Ice red (2.63) Miniature (2.91)

Table 4: Categorization of rose varieties for their susceptibility to thrips, *F. occidentalis* based on population on flower

Category of resistant	Scale $\overline{X}$ = 6.59 sd = 3.02	Varieties ($\overline{X_i}$)
Highly resistant (HR)	$\overline{X_i}$ < 3.57	Basrai (2.61) Paradise (3.04) Red farida (3.56)
Resistant (R)	$\overline{X_i}$ > 3.57 < 6.59	Lemon sarbat (4.04)
Susceptible (S)	$\overline{X_i}$ > 6.59 < 9.61	Dilkhush (7.01) Eiffel tower (7.62) Summer holiday (8.58) Devine (9.15)
Highly susceptible (HS)	$\overline{X_i}$ > 9.61 < 12.63	Ice red (9.72) Miniature (10.66)

The results on influence of leaf colour of rose on thrips (Table 5) indicated that Ice red and Miniature possessed dark green leaf; Devine, Paradise, Summer holiday, Eiffel tower, Red farida and Basrai possessed green leaf; and Lemon sarbat and Dilkhush possessed light green leaf.

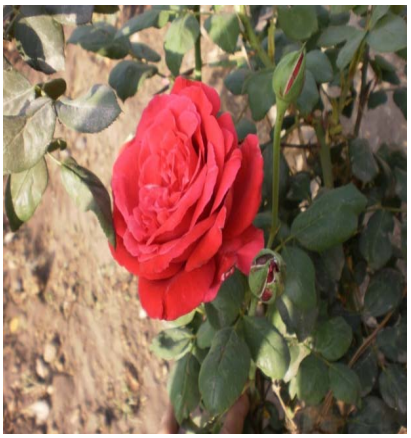
The correlation coefficient study between leaf colour and thrips population revealed that there was a positive and significant relationship (r = 0.602) between leaf colour and thrips population. With the increase in intensity of green colour in leaf, the thrips population also increased. The highest thrips population was recorded in Ice red and Miniature varieties of rose (three colour grade), while it was the lowest in Lemon sarbat and Dilkhush varieties of rose (one colour grade).

Table 5: Relationship of thrips population with leaf colour of rose varieties

Variety	Leaf colour	Leaf colour grade	Number of thrips/leaflet
Ice red	Dark green	3	2.63
Miniature	Dark green	3	2.91
Devine	Green	2	2.46
Paradise	Green	2	1.28
Lemon sarbat	Light green	1	1.62
Summer holiday	Green	2	2.13
Dilkhush	Light green	1	1.79
Eiffel tower	Green	2	2.24
Red farida	Green	2	1.46
Basrai	Green	2	1.21
Correlation co-efficient (r) = 0.602* n = 8			

1. Ice Red

2. Miniature

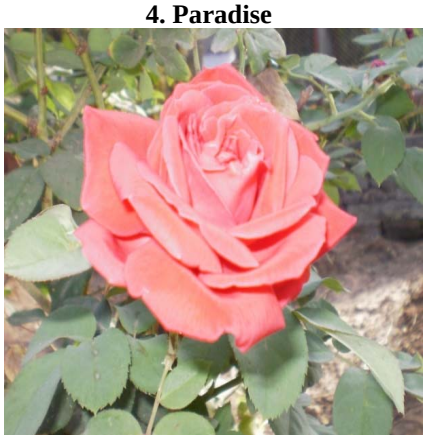


3. Devine


4. Paradise


5. Lemon Sarbat


6. Summer Holiday


7. Dilkhush


8. Eiffel Tower


9. Red Farida


10. Basrai

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Author Profile

Hiren Kanara received the B.Sc. degree in Agriculture and M.Sc. (Agri.) degree in Entomology from Junagadh Agricultural University in 2011 and 2013, respectively. He is continuing Ph.D. (Agri.) in Entomology from Junagadh Agricultural University, Junagadh, Gujarat. He achieved first class grade in P.G. studies. He completed research work on western flower thrips on rose.

Mahesh Acharya received the B.Sc., M.Sc. and Ph.D. degrees in Agriculture specialized in Entomology with first class grade point. He is working as an Assistant Professor in Entomology at Junagadh Agricultural University, Junagadh, Gujarat, India.