

## Evaluation of groundnut entries against Jassid and Thrips

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**Abstract:** The experiment was carried out at the field of the Oilseed Research Centre, Regional Agricultural Research station, Bangladesh Agricultural Research Institute (BARI), Ramatpur, Barisal during rabi seasons of 2007-2008 and 2008-2009 to evaluate the performance of some groundnut varieties/entries against jassids and thrips. Sixty groundnut entries of OT, PYT and RYT were evaluated against jassid and thrips infestation during 2008 and 2009. Of these, five entries of observation Trial (OT Set-1), four entries of (OT Set-2), five entries of PYT and five entries of RYT were found comparatively less jassid (5-9%, 8-11%, 5-9% and 7-11% leaf infestation) and thrips (3-4%, 4-5%, 2-4% and 4-6% leaf infestation) than the other entries and check variety BARI Chinabadam-8 and Dhaka-1 (15-22%, 22-20%, 12-19% and 18-12% leaf for jassid and 7-9%, 9-8%, 6-8% and 10-7% leaf for thrips).

**Key words:** Evaluation, Groundnut, Jassid, Thrips.

### Introduction

Groundnut (*Arachis hypogaea* L.) is the third most important legume oilseed crop in Bangladesh (Anon.2008.) which is grown 27073 ha with a production of 34240 metric tons in 2002-2003 (BBS, 2005). It is used as edible oil, seed content 48-50% oil and 22-29% protein, to make cake, biscuit and others confectionary purpose. Recently the area of groundnut is being decreased due to the competition with rabi crops like wheat, potato, boro rice and mustard (Biswas et al., 1997). Moreover, most of the char areas of Bangladesh become inundated in the kharif season which causes decline of groundnut area. In kharif season, only some high lands are used for groundnut cultivation. Jassid (*Empoasca terminalis*) and thrips (*Scirtothrips dorsalis*) are the important insect pests of groundnut. They suck the sap from the tender leaflets causing the yellowing or browning the leaflets, showing leaf curling followed by necrosis and finally stunting the growth and gradually die. It also acts as a vector of leaf curled, tomato spotted and other viruses (Singh, 1990). Although chemical insecticides are effective control measures against these pests but the bad-effect of pesticides uses are well known. The breeding of insect resistant varieties is an important non chemical management technique which is ecologically sound and socially acceptable for the farmers (Prasad, 1995). Therefore, the experiment has been undertaken to evaluate the performance of some groundnut varieties/ entries against jassids and thrips.

### Materials and Methods

The experiment was conducted in the field of the Oilseed Research Centre, Regional Agricultural Research station, Bangladesh Agricultural Research Institute (BARI), Ramatpur, Barisal during three rabi season of 2007-2008 and 2008-2009. The experiment was laid out in a randomized complete block design (RCBD) with three replications. The unit plot size was 3 m X 4 m. The spacing maintained for groundnut was 30 cm row to row and 10 cm seed to seed distances. Fertilizers were applied at 25-160-85-300-5-10 kg/ha of urea, triple super phosphate, muriate of potash, gypsum, zinc sulphate and borax respectively, as recommended for Bangladesh (Anon, 2004). One half amount of urea and full dose of all other fertilizers were incorporated into the soil at the time of final land preparation. The remaining urea was top

dressed in two equal installments at 35 and 65 days after sowing. During land preparation, cowdung was applied at 10 ton/ha. Intercultural operations, such as irrigation was given twice, weeding, mulching and earthing up were done as and when necessary. Seeds of groundnut were sown on 2nd week of December 2007 and 2008. Sixty groundnut entries of OT, PYT, RYT and ICRISAT lines were evaluated against jassid and thrips infestation. For evaluation of thrips damage, the total number of leaflets in five randomly sampled plants from the central two rows of a plot have been recorded and counted the number of leaflets showing thrips injury symptoms. Percent damage foliage for jassids was recorded by visual observations from the standing crop in natural field condition. Injury rating for both jassids and thrips on 1-9 scale supplied by ICRISAT is as follows:

| % Damage foliage | Injury rating |
|------------------|---------------|
| 0                | 1             |
| 1-5              | 2             |
| 6-10             | 3             |
| 11-20            | 4             |
| 21-30            | 5             |
| 31-40            | 6             |
| 41-50            | 7             |
| 51-75            | 8             |
| 76-100           | 9             |

The leaf infestation was recorded on February 20, March 7 and 22, April 5, 20 and May 5 and 20 in 2008 and 2009 at 15 days intervals at the vegetative, flowering and pod formation stages of the crop.

### Results and Discussion

The highest infestation (45% leaf for jassids and 22% leaf for thrips) was recorded on the third week of March at the pod formation stage of the crop (90-100 DAS) and then declined gradually (Table 1). Almost similar observation was reported by Kaul and Das (1986) and Biswas *et al.* (2000) in Bangladesh. Out of nineteen groundnut entries of OT (set-1), five entries namely, ICGV-97119, F6-16-1, F6-23-1, F6-34-3 and F6-36-4 were found comparatively less jassids (5-9% leaf infestation) and thrips (3-4% leaf infestation) than the other entries and check variety BARI Chinabadam-8 and Dhaka-1 (15% and 22% leaf

infestation for jassid and 7% and 9% leaf infestation for thrips) (Table 1) and four entries of OT (Set-2) namely, ICGV-5261-G-40, J-2002-11, J-2002-4 and J-2002-24 were found comparatively less jassids (8-11% leaf infestation) and thrips (4-5% leaf infestation) than the other entries and check variety BARI Chinabadam-8 and Dhaka-1 (22% and 20% leaf infestation for jassid and 9% and 8% leaf infestation for thrips) (Table 2). In PYT plots, five entries namely, SL-1, Chico, ICGV-00380, ICGV-93416, and ICGV-86124 were found comparatively less jassid (5-9% leaf infestation) and thrips (2-4% leaf

infestation) than the other entries and check variety BARI Chinabadam-8 and Dhaka-1 (12% and 19% leaf infestation for jassid and 6% and 8% leaf infestation for thrips) (Table-3). In RYT plots, four entries namely, ICGV-9316-G-6, ICGV-3479-G-82, ICGV-3479-G-37 and ICGV-95063 were found comparatively less jassids (7-11% leaf infestation) and thrips (4-6% leaf infestation) than the other entries and check variety BARI Chinabadam-8 and Dhaka-1 (18-12% leaf infestation for jassid and 10-7% leaf infestation for thrips) (Table-4).

**Table 1.** Evaluation of groundnut entries against jassid and thrips in OT (set-1) (two years pooled)

| Treatment           | Leaf infested by jassid (%) | Injury rating | Leaf infested by thrips (%) | Injury rating |
|---------------------|-----------------------------|---------------|-----------------------------|---------------|
| ICGV-00290          | 20                          | 4             | 5                           | 2             |
| ICGV-01260          | 24                          | 5             | 9                           | 3             |
| Vietnum             | 13                          | 4             | 5                           | 2             |
| ICGV-97119          | 9                           | 3             | 4                           | 2             |
| ICGV-00351          | 13                          | 4             | 4                           | 2             |
| ICGV-99102          | 15                          | 4             | 5                           | 2             |
| F <sub>6</sub> 23-2 | 25                          | 5             | 8                           | 3             |
| F <sub>6</sub> 23-3 | 15                          | 4             | 5                           | 2             |
| F <sub>6</sub> 23-1 | 9                           | 3             | 3                           | 2             |
| F <sub>6</sub> 3-2  | 15                          | 4             | 5                           | 2             |
| F <sub>6</sub> 15-2 | 16                          | 4             | 5                           | 2             |
| F <sub>6</sub> 36-4 | 6                           | 3             | 3                           | 2             |
| F <sub>6</sub> 16-2 | 10                          | 3             | 5                           | 2             |
| F <sub>6</sub> 36-1 | 12                          | 3             | 4                           | 2             |
| F <sub>6</sub> 7-2  | 10                          | 3             | 4                           | 2             |
| F <sub>6</sub> 34-3 | 5                           | 2             | 3                           | 2             |
| F <sub>6</sub> 32-4 | 10                          | 3             | 5                           | 2             |
| F <sub>6</sub> 16-1 | 6                           | 3             | 4                           | 2             |
| BARI Chinabadam-8   | 15                          | 4             | 7                           | 3             |
| Dhaka-1             | 22                          | 5             | 9                           | 3             |

**Table 2.** Evaluation of groundnut entries against jassid and thrips in OT (set-2) (two years pooled)

| Treatment         | Leaf infested by jassid (%) | Injury rating | Leaf infested by thrips (%) | Injury rating |
|-------------------|-----------------------------|---------------|-----------------------------|---------------|
| ICGV-93463        | 17                          | 4             | 6                           | 3             |
| ICGV-01224G-75    | 16                          | 4             | 7                           | 3             |
| ICGV-J-2001-5     | 28                          | 5             | 10                          | 3             |
| ICGV-87860-G-3    | 15                          | 4             | 8                           | 3             |
| ICGV-J-2001-12    | 15                          | 4             | 6                           | 3             |
| ICGV-94351-G-57   | 24                          | 5             | 11                          | 3             |
| ICGV-5261-G-40    | 10                          | 4             | 5                           | 2             |
| ICGV-93472-G-26   | 30                          | 5             | 13                          | 3             |
| ICGV-44341-G-45   | 19                          | 4             | 6                           | 3             |
| J-2001-9          | 14                          | 4             | 4                           | 2             |
| BARI Chinabadam-8 | 22                          | 5             | 9                           | 3             |
| J-2002-1          | 12                          | 3             | 9                           | 3             |
| J-2002-11         | 8                           | 3             | 5                           | 2             |
| J-2002-24         | 10                          | 3             | 4                           | 2             |
| J-2002-10         | 12                          | 3             | 6                           | 3             |
| J-2002-9          | 26                          | 5             | 8                           | 3             |
| J-2002-16         | 31                          | 6             | 10                          | 3             |
| J-2002-4          | 11                          | 4             | 4                           | 2             |
| PL-284-4-91       | 15                          | 4             | 5                           | 2             |
| J2002-22          | 27                          | 5             | 7                           | 3             |
| Dhaka-1           | 20                          | 4             | 8                           | 3             |

**Table 3.** Evaluation of groundnut entries against jassid and thrips in PYT plots (two years pooled)

| Treatment         | Leaf infested by jassid (%) | Injury rating | Leaf infested by thrips (%) | Injury rating |
|-------------------|-----------------------------|---------------|-----------------------------|---------------|
| PK-97250(VR)      | 12                          | 4             | 5                           | 2             |
| SL-1              | 8                           | 3             | 3                           | 2             |
| ICGV-01249        | 13                          | 4             | 5                           | 2             |
| ICGV-90227        | 10                          | 3             | 5                           | 2             |
| ICGV-99195        | 10                          | 3             | 5                           | 2             |
| ICGV-00380        | 6                           | 3             | 3                           | 2             |
| Chico             | 8                           | 3             | 2                           | 2             |
| ICGV-94105        | 23                          | 5             | 6                           | 3             |
| ICGV-93416        | 9                           | 3             | 4                           | 2             |
| ICGV-911228       | 12                          | 4             | 5                           | 2             |
| ICGV-86124        | 5                           | 2             | 3                           | 2             |
| ICGV-00298        | 17                          | 4             | 5                           | 2             |
| ICGV-98371        | 18                          | 4             | 5                           | 2             |
| BARI Chinabadam-8 | 12                          | 3             | 6                           | 3             |
| Dhaka-1           | 19                          | 4             | 8                           | 3             |

**Table 4.** Evaluation of groundnut entries against jassid and thrips in RYT plots (two years pooled)

| Treatment         | Leaf infested by jassid (%) | Injury rating | Leaf infested by thrips (%) | Injury rating |
|-------------------|-----------------------------|---------------|-----------------------------|---------------|
| ICGV-9316-G-6     | 8                           | 3             | 6                           | 3             |
| ICGV-91114G-32    | 13                          | 4             | 8                           | 3             |
| ICGV-3479G-82     | 11                          | 4             | 6                           | 3             |
| ICGV-3479G-37     | 9                           | 3             | 5                           | 2             |
| ICGV-95058        | 16                          | 4             | 7                           | 3             |
| ICGV-95063        | 7                           | 3             | 4                           | 2             |
| ICGV-95066        | 18                          | 4             | 10                          | 3             |
| ICGV-95070        | 21                          | 5             | 12                          | 4             |
| BARI Chinabadam-8 | 18                          | 4             | 10                          | 3             |
| Dhaka-1           | 12                          | 4             | 7                           | 3             |

These selected groundnut entries/varieties can be used as breeding program for developing suitable jassid and thrips tolerant groundnut varieties.

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