

Seasonal incidence of thrips (*Thrips tabaci*, Lind.) on onion in Khandesh region of Maharashtra

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ABSTRACT

Seasonal incidence of thrips on onion was evaluated in field trials at the instructional farm of Agricultural Entomology Section, College of Agriculture, Dhule during *Kharif* season of 2015-16. The data on average number of thrips per plant under field conditions along with weather parameters *viz.*, temperature (maximum and minimum), relative humidity (morning and evening) and rainfall are correlated. The infestation of thrips was first observed at 2nd week after transplanting in 38th SMW, with population of 1.6 thrips/plant. The population of thrips above 5 thrips /plant was noticed from 4th week of September *i.e.* 40th SMW onwards. The peak incidence of 19.1 thrips/plant was recorded in 46th SMW *i.e.* second week of November. The correlation of thrips with morning humidity (-0.7324)***, evening humidity (-0.7123)***and rainfall(-0.5820)*are negatively significant effect at 5 per cent and 1 per cent level with thrips.

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Onion (*Allium cepa* L.) is grown all over the world and is a favourite vegetable in India. It is relished mostly as salad and Indian cuisine is steadily increasing. Onion is now the second most important horticultural crop after tomato in India. India is the second largest onion producing country in the world. In India onion is grown in an area of 10.15 lakh ha with production of 247.63 lakh mt and productivity of 24.39 t/ha (Neergude *et al.*, 2014). It is also rich in flavonoides and alkenyl cysteine sulphoxides which play a part in preventing heart diseases and other ailment in human beings (Gareth *et al.*, 2002).

Major limiting factors for onion yield production are pests such as thrips (*Thrips tabaci* Lind.) and diseases

such as purple blotch (*Alternaria porri*), downy mildew (*Perenospora destructor*), leaf spot and onion smudge (*Colletotricum circinans*) (Robinowitch and Currah, 2002).

Among the various pests, thrips is a regular and potential pest of onion causes considerable huge losses in quality and yield (Dharmasena, 1998). Therefore, management of onion thrips is the vital to the production and profitability of this crop. If onion thrips are not controlled, damage can routinely reduce bulbs yield by 30 to 50 per cent (Nault and Shelton, 2010) and onion yield reductions can reach upto the levels from 34 to 50 per cent (Fournier *et al.*, 1995). Thrips attack on onion

observed at all stages of crop growth, but their count increases from bulb initiation and remain high upto the bulb development till to the maturity. Thrips are the major problem on this crop and the most common during warm weather. Thrips are very small, slender insect pest seen with a hand lens. Onion thrips are about 1.3 mm long. Thrips have two pairs of wings that are fringed with long hairs. Adults are pale yellow to light brown in colour. The immature stages have the same body shape as adults but lighter in colour and are wingless. They feed with a rasp and suck behaviour that removes leaf chlorophyll causing white to silver patches and streaks. Thrips in onion are difficult to control because of succulent nature of leaves, which prevent spray solution reaching the pest due to hiding habit of thrips in central axis near the bulb (Shitole *et al.*, 2002).

Seasonal incidence studies conducted at the instructional farm of Agril. Entomology Section, College of Agriculture, Dhule in onion during late *Kharif* season of 2015-16. The onion seedling of variety Phule Samartha was transplanted on 8th September 2015. The plot size was kept as 4 m x 3 m. To study the influence of weather

parameters on seasonal incidence of pest, the observations were recorded on five randomly selected tagged plants of each plot in the untreated field during each meteorological week (SMW). Correlation of weather parameters with the population dynamics of onion thrips was worked out.

The meteorological data on temperature (maximum and minimum), relative humidity (morning and evening) and rainfall were obtained from the meteorological observatory located at the College of Agriculture Campus, Dhule.

The data on average number of thrips per plant under field conditions along with weather parameters *viz.*, temperature (maximum and minimum), relative humidity (morning and evening) and rainfall are presented in Table 1. The infestation of thrips was first observed at 2nd week after transplanting in 38th SMW, with population of 1.6 thrips/plant. The population of thrips above 5 thrips /plant was noticed from 4th week of September *i.e.* 40th SMW onwards. The peak incidence of 19.1 thrips/plant was recorded in 46th SMW *i.e.* second week of November when the maximum and minimum

Table 1: Seasonal incidence of the onion thrips in relation to weather parameters

| Month | Meteorological Week (MW) | Av. No. of thrips/ plant | Temperature (°C) | | Relative humidity (%) | | Rainfall (mm) |
|------------|--------------------------|--------------------------|------------------|---------|-----------------------|---------|---------------|
| | | | Maximum | Minimum | Morning | Evening | |
| Sept. 2015 | 37 | | 34.6 | 23.6 | 78.6 | 43.3 | 010.8 |
| | 38 | 1.6 | 33.9 | 23.6 | 82.7 | 51.9 | 039.8 |
| | 39 | 2.8 | 31.7 | 22.5 | 82.6 | 62.6 | 137.6 |
| | 40 | 7.4 | 33.5 | 21.0 | 80.0 | 39.4 | 000.0 |
| Oct. 2015 | 41 | 10.1 | 35.2 | 22.2 | 80.3 | 37.9 | 005.4 |
| | 42 | 15.1 | 36.0 | 21.8 | 79.1 | 32.4 | 002.0 |
| | 43 | 17.4 | 36.0 | 20.3 | 69.4 | 27.7 | 000.0 |
| | 44 | 16.8 | 35.3 | 21.4 | 71.6 | 32.7 | 000.0 |
| Nov. 2015 | 45 | 18.9 | 32.6 | 17.8 | 73.9 | 33.7 | 000.0 |
| | 46 | 19.1 | 34.3 | 18.6 | 69.4 | 27.9 | 000.0 |
| | 47 | 17.8 | 33.5 | 16.3 | 71.6 | 26.3 | 000.0 |
| | 48 | 11.4 | 32.0 | 18.7 | 76.6 | 35.7 | 001.8 |
| Dec. 2015 | 49 | 9.0 | 33.5 | 18.7 | 68.9 | 31.3 | 000.0 |
| | 50 | 6.4 | 32.6 | 13.9 | 76.7 | 25.6 | 000.0 |

Table 2: Correlation between onion thrips infestation with weather parameters

| Sr. No | Details | Meteorological parameters | | | | |
|---------------------------------|-------------------------|---------------------------|-----------|------------------|------------------|----------|
| | | Max. temp. | Min. temp | Morning humidity | Evening humidity | Rainfall |
| Correlation co-efficient values | | | | | | |
| 1 | Av. no. of thrips/plant | 0.4270 | -0.3143 | -0.7324** | -0.7123** | -0.5820* |

* and ** indicate significance of values at P=0.05 and 0.01 level is 0.532 and 0.661, respectively

temperatures were 34.3 and 18.6 degree celsius, respectively and 69.4 and 27.9 per cent relative morning and evening humidity, respectively. The population of thrips started declining towards the maturity of the crop.

Correlation of weather parameters with thrips on onion :

The data pertaining to the seasonal incidence of onion thrips and their correlation with weather parameters are furnished in Table 2. The correlation of thrips with morning humidity (0.7324)**, evening humidity (-0.7123)** and rainfall (-0.5820)* are negatively significant. This indicates that increase in rainfall and humidity (evening and morning) decreases the thrips population in onion and *vice versa*.

Gill *et al.* (2006) also observed similar results and reported that the mean population of onion thrips, *T. tabaci*, ranged from 0.1 - 0.4 thrips/leaf and also reported maximum population during December and February.

The results are in confirmly with Neergude *et al.* (2014) who reported that the prevalence of high population of thrips in the *Kharif* season especially during August to October. Generally, the population of thrips occurrence on onion crop was peak during bulb development and physiological maturity stage.

REFERENCES

- Dharmasena, C.M.D. (1998).** Present status of managing leaf curl complex in the north central province of Sri-lanka. *Trop. Agric. Res. & Extn.*, **1**(2): 154-158.
- Fournier, F., Boivin, G. and Stewart, R.K. (1995).** Effect of *Thrips tabaci* on yellow onion yields and economics thresholds for its management. *J. Econ. Entomol.*, **88**: 1401-1407.
- Gareth, G., Laurence, T. and Brian, S. (2002).** Onions-A global benefit to health. *Phytotherapy Res.*, **16**: 603-615.
- Gill, C.K., Bhullar, Manmeet, Dhooria, M.S. and Brar, P.S. (2006).** Incidence of *Thripstabaci* (Lind.) and *Aceriatulipae* (Keifer) on garlic in Punjab. *J. Insect Sci.*, **19**(1): 88-90.
- Nault, B.A. and Shelton, A.M. (2010).** Impact of insecticide efficacy on developing action thresholds for pest management: A case study of onion thrips on onion. *J. Econ. Entomol.*, **103**: 1315-1326.
- Neergude, Mallinath, Biradar, A.P., Veerendra, A.C. and Sathisha (2014).** Seasonal abundance of onion thrips, *T. tabaci* Lind. and their natural enemies under dry land conditions. *IJAPBC*, **3** (1) : 33-36.
- Robinowitch, H.D. and Currah, L. (2002).** *Allium crop science: Recent advances*. CAB International Wallington, UK. pp.-551.
- Shitole, D.M., Shankar, G. and Mithyantha, M.S. (2002).** Evaluation of certain new insecticides against onion thrips (*Thrips tabaci* Lind.). *Pestology*, **26**(2): 49-51.

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