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EFFECT OF FERTILIZER LEVELS ON INCIDENCE OF THRIPS ON GARLIC

Garlic, *Allium sativum* L. is an important cultivated crop of the country. It is used as a spice or a condiment, in pharmaceutical preparations and flavouring and seasoning vegetables and meat dishes. India ranks second after China in area (171.45 lakh ha^{-1}) and third in production (923.25 thousand metric tonnes) of garlic with an average productivity of 5.38 t ha^{-1} (Anonymous, 2009). The major garlic producing states of the country are Madhya Pradesh, Orissa, Rajasthan, Karnataka and Gujarat; besides, India is one of the garlic exporting country of the world. The sowing times and fertilizer levels influence the incidence of thrips on garlic and manipulation in fertilizer doses would be helpful for the management of thrips population in garlic (Chhatrola *et al*., 2006). Use of fertilizers not only affects the nutritive value of plants, but also influences the insect pest abundance (Dowell and Steinberg, 1990 and Bentz *et al*., 1995).

The present investigations were conducted at Horticulture Farm, S.K.N. College of Agriculture, Jobner (Rajasthan) on garlic crop during *rabi,* 2011-12. The recommended doses of NPK for garlic in this zone (semi-arid eastern plain zone III-A) are 120: 40: 60 kg ha^{-1}. Nitrogen was applied through urea; one third as basal dose and remaining half was applied in two splits at 30 and 60 days after sowing. Phosphorus and potassium were applied through single super phosphate and muriate of potash, respectively at the time of last ploughing. Well rotten farm yard manure was incorporated in the soil at the time of field preparation (20 t ha^{-1}). The experiment was laid out in a randomized block design (RBD) with nine treatments i.e. fertilizers levels (N_{75} K_{75}, N_{75} K_{100}, N_{75} K_{125}, N_{100} K_{75}, N_{100} K_{100}, N_{100} K_{125}, N_{125} K_{75}, N_{125} K_{100} and N_{125} K_{125}), each replicated thrice. The recommended dose of phosphorus (60 kg ha-1) through single super phosphate, whole of the potash through muriate of potash and one third of nitrogen through urea were applied basally and remaining nitrogen was applied in two splits at 30 and 60 days after sowing. Local variety of garlic was planted on 29th October 2011 in plots of size 1.5m x 1.5 m (2.25 m^2), keeping row to row and plant to plant distance of 15 and 10 cm, respectively. The crop was allowed for natural infestation of thrips. Observations on thrips were recorded at weekly intervals. The data obtained on thrips population were transformed into $\sqrt{x} \pm 0.5$ values and subjected to analysis of variance. The clove yield of garlic in each plot was also computed, converted into quintal per hectare and analyzed.

The data presented in Table (1) reveal that there was a significant difference in the population of thrips in the different levels of fertilizer during the crop season. On the basis of seasonal mean population of thrips, the minimum population of thrips (7.07 thrips /plant) was observed in the treatment of $N_{75}K_{125}$ i.e. lower dose of nitrogen and higher dose of potash followed by $N_{75}K_{100}$ (8.27 thrips /plant) and $N_{100}K_{125}$ (9.27 thrips /plant). The maximum population of thrips was observed in the treatment of $N_{125}K_{75}$ (17.90 thrips /plant) i.e. higher dose

Table 1. Effect of fertilizer levels on the incidence of thrips, *T. tabaci* during *rabi,* 2011-12

S. No.	Fertilizer Levels	Seasonal Mean	Clove yield (q ha^{-1})
1	N_{75} K_{75}	10.75 (3.35)	223
2	N_{75} K_{100}	8.27 (2.96)	225
3	N_{75} K_{125}	7.07 (2.75)	227
4	N_{100} K_{75}	15.00 (3.94)	217
5	N_{100} K_{100}	11.92 (3.52)	231
6	N_{100} K_{125}	9.27 (3.13)	235
7	N_{125} K_{75}	17.90 (4.29)	210
8	N_{125} K_{100}	15.84 (4.09)	215
9	N_{125} K_{125}	13.06 (3.68)	233
	S. Em. $\pm$	0.07	1.89
	CD (p=0.05)	0.22	5.65

Note: Figures in the parentheses are X+0.5 values

of nitrogen and lower dose of potash followed by $N_{125}K_{100}$ (15.84 thrips /plant) and $N_{100}K_{75}$ (15.00 thrips /plant). The maximum clove yield of 235 q ha-1 was recorded in the treatment of $N_{100}K_{125}$ i.e. recommended dose of nitrogen and higher dose of potash, followed by $N_{125}K_{125}$ (233 q ha-1), $N_{100}K_{100}$ (231 q ha-1) as these were statistically at par with each other. The minimum clove yield was obtained in the treatment of $N_{125}K_{75}$ (210 q ha-1) i.e. higher dose of nitrogen and lower dose of potash. In general, the incidence of pests was significantly lower in field that received high rate of potash and significantly greater in field that received high rate of nitrogen. The use of high level of nitrogen increased thrips infestation in garlic and potassium at enhanced doses decreased the population of thrips (Mahadev *et al*., 1995). Oliveira *et al* (1995) observed highest thrips population in the treatment with the highest level of nitrogen (150 kg ha-1) in garlic. Chhatrola *et al* (2006) observed lowest mean thrips population in the treatment with the lower dose of nitrogen and the highest mean thrips population in the treatment with the highest dose of nitrogen. Malik *et al* (2003) noticed maximum thrips population in onion crop with the higher dose of nitrogen application; further, they also reported that crop yield had direct relation with increased fertilizer dose up to 200 kg N ha^{-1}. Srivastava *et al* (2005) observed significantly higher population of thrips in higher dose of fertilizers (125 and 150 kg N ha-1); however, the bulb yield was maximum in highest dose of nitrogen.

REFERENCES

Anonymous, 1999. *Annual report on garlic,* Associate Agricultural Development Foundation*, Nasik. pp.15.*

Anonymous, 2009. *Statistics at a Glance*, National Research Centre for Onion and Garlic, Nashik, pp. 1-3.

Anonymous, 2010a. *Rajasthan Agricultural Statistics at a Glance*. Commissioner of Agriculture, Rajasthan, Jaipur, pp. 107.

Anonymous, 2010b. *Annual Report*. All India Network Research Project on Onion and Garlic, ARS, Durgapura, Jaipur (Rajasthan), pp. 284-285.

Bentz, J.A.; Reeves, J.; Barbosa, P. and Francis, B. 1995. Nitrogen fertilizer effect on selection, acceptance and suitability of Euphorbia pulcherrima (Euphorbiaceae) as a host plant to Bemisia tabaci (Homoptera: Aleyrodidae). *Indian Journal of Entomology,* **30**: 110-115.

Chhatrola, D.P.; Vyas, H.J. and Baraiya, K.P. 2006. Effect of irrigation, date of sowing and nitrogen on the incidence of garlic thrips, *Thrips tabaci* Lindemen. *Indian Journal of Entomology*, **68**: 121-124.

Dowell, R. V. and Steinberg, B. 1990. Influence of host plant characteristics and nitrogen fertilizers on development and survival of immature citrus black fly, *Aleurocanthus woglumi* Ashby. *Journal of Applied Entomology*, **109**: 113-119.

Khayat, E.I.; Shalaby, E.F.; Lotfy, F.M. and Ibrahim, A.R. 1997. Thrips infestation to onion plants in relation to onion variety, planting date and nitrogen fertilization. *Annals of Agricultural Science - Moshtohor*, **35**: 1761-1777.

Mahadev, P., Das, M., Gosh, M.R. and Mukherjee, N. 1995. Effect of fertilizer treatments on growth, productivity, insect pests and disease incidence of thrips. *Madras Agricultural Journal*, 82: 525-527.

Malik, M.F.; Nawaz, M. and Hafeez, Z. 2003. Different regimes of nitrogen and invansion on thrips on onion in Balochistan, Pakistan. *Asian Journal of Plant Science*, 2: 916-919.

Oliveira, A.P.; Castellane, P.D.; Bortoli, S.A.; De and Banzatto, D. A. 1995. Effect of genotype, nitrogen, mulching and deltamethrin on the incidence of thrips in garlic. *Horticultura Brasieira*, 13: 202-205.

Srivastava, K.J.; Tiwari, B.K.; Sharma, R.C. and Chauhan, K.P.S. 2005. Evaluation of different advanced lines against stemphylium blight, purple blotch and thrips insect pest of garlic. *Newsletter National Horticultural Research and Development Foundation*, **25**: 10-12.

RAMGOPAL DUDWAL
B. L. JAT
ALKA KATARIA

[1]Rajasthan Agricultural Research Institute, Durgapura, Jaipur, Rajasthan, India
[2]Department of Agricultural Zoology & Entomology, S.K.N. College of Agriculture, Jobner-303 329, Rajasthan, India.
[3]University of Rajasthan, Jaipur, Rajasthan, India
*Corresponding author - rgdudwal1986@gmail.com