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EFFECT OF NITROGEN ON THE INCIDENCE OF *TETRANYCHUS CINNABARINUS* (BOISDUVAL) INFESTING OKRA, *ABELMOSCHUS ESCULENTUS* (L.) MOENCH

Okra, *Abelmoschus esculentus* (L.) Moench is also known as lady's finger (Vernacular name: *Bhindi*), a popular vegetable crop known for its high nutritional and medicinal values. Insect pests are considered to be the major constraint in reduction of yield. Among the pests complex, the mite, *Tetranychus cinnabarinus* cause appreciable damage to okra crop particularly during dry months of the year even under drought conditions. However, Gupta (2005) reported 23–27 per cent damage in okra due to the infestation of *T. cinnabarinus*. It sucks the cell sap from the leaves and produce white spots which later get covered by thick webs as a result the photosynthetic activity is retarted, affected leaves loose green colour, dry and drop pre maturely, finally resulting in poor fruit setting. An appropriate dose of nitrogen would form an integral component of pest management system, particularly, in reference to mite infested agro–ecosystem. Okra being a high value vegetable crop, chemical control is generally practiced for higher grains, which results in population imbalance of both the pest as well as natural enemies. However, these cannot be disposed off due to their efficacy and economics. Thus, there is an urgent need to adopt measures to restore ecological balance without affecting yield potential.

To see the response of different doses of nitrogen against *T. cinnabarinus* on okra a field trial was laid out at Horticulture Farm, S.K.N. College of Agriculture, Jobner. The okra variety Arka Anamika was sown in the third week of July 2010. The experiment was laid out in Randomized Block Design replicated four times. The dose of nitrogen was given through urea in two splits (50% as basal and remaining 50% at 30 DAS). The recommended dose of phosphorus and potassium was given in all the plots basally through single super phosphate (SSP) and murate of potash (MOP) @ 30 kg ha^{-1}, respectively. Observations on the incidence of mite, *Tetranychus cinnabarinus* (Boisduval) were recorded after one month of germination of the crop and later observations were recorded at weekly interval on five randomly selected plants. For counting of mite population, nine leaves were observed from each plant, *i.e.,* three leaves each from top, middle and bottom portions of the plant with the help of hand lens (Anonymous, 2000). The data thus generated were transformed and analyzed statistically using the values in $\sqrt{x + 0.5}$.

The mite population was recorded at weekly interval starting from pest appearance till its disappearance (Table 1). The mite infestation first appeared on 20th September,

Table 1. Response of nitrogen against mite, *Tetranychus cinnabarinus* (Boisduval) on okra in *kharif*, 2010

S. No.	Nitrogen doses kg ha^{-1}	Mean mite population / 9 leaves							
		20/09/2010	27/09/2010	04/10/2010	11/10/2010	18/10/2010	25/10/2010	01/11/2010	Mean
1.	0	2.25	7.75	105.00	220.50	373.00	256.00	135.75	157.17
		(1.65)	(2.85)	(10.27)	(14.79)	(19.27)	(15.99)	(11.59)	(12.55)
2.	20	1.00	24.75	157.50	241.75	413.75	246.00	173.25	179.71
		(1.12)	(4.96)	(12.54)	(15.52)	(20.34)	(15.68)	(13.12)	(13.42)
3.	40	3.25	36.25	159.50	265.75	456.75	260.50	138.25	188.60
		(1.89)	(5.53)	(12.63)	(16.29)	(21.36)	(16.12)	(11.66)	(13.75)
4.	60	5.50	38.73	170.50	299.75	478.50	348.00	196.75	219.67
		(2.43)	(6.26)	(13.04)	(17.32)	(21.85)	(18.65)	(14.01)	(14.83)
5.	80	5.75	48.25	188.75	320.75	543.00	364.50	212.25	240.46
		(2.49)	(6.97)	(13.72)	(17.90)	(23.27)	(19.04)	(14.53)	(15.52)
6.	100	11.25	52.00	226.50	398.75	673.25	513.75	260.50	305.14
		(3.42)	(7.20)	(15.06)	(19.93)	(25.93)	(22.61)	(16.12)	(17.48)
	S.E.m ±	0.16	0.40	0.73	0.64	0.67	0.69	0.78	0.55
	CD at 5%	0.48	1.21	2.21	1.95	2.03	2.10	2.34	1.75

Values in parentheses are $\sqrt{x + 0.5}$

2010 and the population ranged from 1.00 to 11.25 mites / 9 leaves in different nitrogen doses. The minimum population was recorded in 20 kg nitrogen ha^{-1} (1.00 mite / 9 leaves), which differed significantly from other nitrogen doses. It was followed by 0 and 40 kg nitrogen ha^{-1}, *viz.*, 2.25 and 3.25 mites / 9 leaves, respectively, however, stood at par with each other. The maximum population of mites appeared in 100 kg nitrogen application (11.25 mites / 9 leaves) and was found significantly different from other nitrogen doses. The other doses of nitrogen were found to be in the middle order with regards to mite population. In ascending order population of mite was found to be in nitrogen dose 20, 0, 40, 60, 80 and 100 kg nitrogen ha^{-1}. The increasing trends in the population of mites were highest on 18th October and found to be in the range of 373.00 to 673.25 mites / 9 leaves, the minimum being in 0 kg nitrogen ha^{-1} (373.00 mites / 9 leaves) followed by 20 kg nitrogen ha^{-1} (413.75 mites / 9 leaves). Doses of 40 and 60 kg nitrogen ha^{-1} had non–significant difference but found at par with 20 kg nitrogen ha^{-1}. The treatment 80 kg nitrogen ha^{-1} had a count of 543.00 mites / 9 leaves and remained at par with 40 and 60 kg nitrogen ha^{-1}. The treatment 100 kg nitrogen ha^{-1} had maximum mite population (673.25 mites / 9 leaves) with significant difference over rest of the other treatments. Based on overall mean population of mite in the season in different treatments of nitrogen doses, the trend was in the order of 0, 20, 40, 60, 80 and 100 kg nitrogen ha^{-1}.

Excessive uses of inorganic/ organic nitrogenous fertilizers generally create congenial conditions for rapid multiplication of many insect pests including mites. The significant increase in the incidence of different species of mite has been recorded with increased application of nitrogenous fertilizers (Puttaswamy and Channa Basavanna, 1981 and Manjunatha, 1982). The observations revealed that the population of okra mite increased with the increase in nitrogen doses. These results are in agreement with the findings of Manjunatha, (1982) who found that increasing the doses of nitrogen increased build up of red spider mite. *T. neocaledonicus* infesting brinjal.

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