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RESEARCH ARTICLE

MONITORING AND TRAPPING OF CHILLITHRIPS, *SCIRTOTHRIPSDORSALIS* (HOOD) POPULATION BY USING BLUE COLORED TRAPS IN ANDHRA PRADESH

^{1,*}Pathipati, V.L., ²Vijaya Lakshmi, T., ³Rajani, ⁴Ramana C.V. and ⁵Naram Naidu, L.

¹Associate Professor (Entomology) and Principal, HPC, Dr YSR Horticultural University, Nuzvid, Krishna district, Andhra Pradesh-521201

²Senior Scientist (Pathology), Horticultural Research Station, Lam Farm, Guntur, Andhra Pradesh-521204

^{3,4}Scientist (Horticulture), Horticultural Research Station, Lam Farm, Guntur, Andhra Pradesh-521204

⁵Principal Scientist (Horticulture) and Head, Horticultural Research Station, Lam Farm, Guntur, Andhra Pradesh-521204

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ABSTRACT

Field experiments were conducted from 2010 -11 to 2011-12 to evaluate the different colored traps to monitor and trap the chilli thrips, *Scirtothrips dorsalis* (Hood) population at Horticultural Research Station, Dr YSR HU, Lam, Guntur, Andhra Pradesh. In 2010-11, among the five traps blue traps were early and effectively monitored the thrips population from September IInd FN to February Ist FN than others. Population trap⁻¹ ranged from 2.9 to 922.72. Early detection of population was recorded with blue traps, i.e September IIndFN (79.22), highest no. trap⁻¹ was recorded in the November-Ist FN (922.72), lowest (2.9) and population was terminated in the February Ist FN. similar trend was observed during 2011-12. About the trapping, based on weekly data in 2010-11, among the traps, blue traps were effectively trapped thrips population, highest population (588.7) was recorded in the last week of October and lowest population (5.99) in February second week. Next best traps in trapping thrips population were, Yellow (hanging and delta shape). Yellow (Hanging) trap was trapped from September third week to February second week (0.77). Blue traps were effectively monitored and trapped the greater thrips population throughout the crop period than other colored traps.

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INTRODUCTION

Chilli (*Capsicum annum* L.), is the fourth most important vegetable crop in the world and first in Asia. World wide it is cultivated in an area of 15 lakh ha with 70 lakh tons productivity and it is very remunerative spice crop of the Indian subcontinent and occupies an area of about 0.81 million ha, which accounts for 40 per cent of the world production. India is the largest producer, exporter and consumer of chilli (Indian Horticultural Database, 2012-13). In India, it is cultivated in 7.9 lakh ha with an annual production of 12.99 lakh tons. In India, important Chilli growing states are Andhra Pradesh, Karnataka, Tamilnadu, Orissa, Maharashtra, Rajasthan and West Bengal (Saideswararao et al., 2013). In Andhra Pradesh, Chilli is an important cash crop, which has got both domestic and export market as vegetable and a condiment. Andhra Pradesh alone accounts for 45-50 percent production of chillies and meet 1/3 rd demand of the country need.

*Corresponding author: Pathipati, V.L.,

Associate Professor (Entomology) and Principal, HPC, Dr YSR Horticultural University, Nuzvid, Krishna district, Andhra Pradesh-521201.

It is grown in an area of 2.37 lakh ha with a production of 7.48 lakh tonnes and productivity of 316 kg/ha. From Andhra Pradesh, chillies is being exported to USA, UK, Japan, France, Srilanka etc to a tune of Rs 3000 crores annually (National Horticultural Board, 2012). Chilli crop, from sowing/planting stage to till the final picking of pods is subjected to the damage by about 293 species of insects and a mite species (Venkateswarrao, 2010). Among the insect pests of Chilli thrips, *Scirtothripsdorsalis* (Hood) is a serious pest in India, it causes 90% yield loss in chilli, 30% in sweet pepper (Rao et al., 2003) and act as vector for tomato spotted wilt virus by feeding on young leaves, buds and fruits. Both nymphs and adults 'rasp' away developing plant tissue with their mouth parts, then suck juices from the wound. In response, young leaves curl upward and appear distorted, buds and fruits become brittle, turn bronze in color and drop. Infested plants become stunted, leaves with petioles detached from the stem, causing defoliation. This pest of early instars can acquire and adults transmits the Tomato Spotted wilt virus (TSWV) (Amin, 1981). It is very difficult to control as it had broad host range, rapid life cycle, and reproduction through parthenogenesis, small size and mobility (Mound and Palmer. 1981).

As chilli is a cash crop, farmers were extensively using wide range of insecticides to control the chilli thrips in Andhra Pradesh resulted in development of resistance against Acephate and Imidacloprid it leads to increased number of sprays (Krishna Kumar, 2009). To know the initial occurrence and subsequent buildup of thrips population in both open and poly house conditions, to prevent the spread of viral diseases and timely management of the thrips population is the need of the day, keeping this in view the present study was done in chilli ecosystem of Andhra Pradesh.

MATERIAL AND METHODS

Two field experiments were conducted in 2010-11 and 2011-12 to evaluate the different colored traps to monitor and trap the chilli thrips, *Scirtothrips dorsalis* (Hood) population at Horticultural Research Station, Dr YSR Horticultural University, Lam, Guntur, Andhra Pradesh. Popular chillivariety *i.e* LCA 334 seedlings raised in the nursery were transplanted at age of 40 days in the main field by adopting a spacing of 75 X 30 cm and a plot size of 500 sq.m area. All the recommended agronomical practices were implemented to raise sound crop except plant protection measures against thrips. Three different colored sticky traps and one non-sticky trap *viz.*, Yellow-hanging, Yellow-Delta shape, blue- hanging, white-hanging and water traps and six traps per each type were installed one meter above the canopy at 15 days after transplanting. For the monitoring, thrips population was recorded at fortnight (FN) interval from September to March as no.trap⁻¹ in both the year. Where as trapping of thrips population, data was recorded at weekly interval in the same period as no.trap⁻¹ in both the year.

After population data was recorded old traps were replaced with new traps at fortnight interval. The mean averages of traps were calculated and were presented in the Tables.

RESULTS AND DISCUSSION

Monitring: During 2010-11, among the five traps blue traps were early and effectively monitored the thrips population from September IInd FN to February Ist FN than others. Population trap⁻¹ ranged from 2.9 to 922.72. Early detection of population was recorded with blue traps, *i.e* September IInd FN (79.22), highest no. trap⁻¹ was recorded in the November-Ist FN (922.72), lowest (2.9) and population was terminated in the February Ist FN. About other traps, population trap⁻¹ was ranged from 2.11 to 70.11 by Yellow (Hanging) traps, highest no. trap⁻¹ was recorded in the November-Ist FN (70.11), lowest (2.11) and population was terminated in the February Ist FN. Yellow (Delta Shape) traps were monitored the thrips population in the October-IInd FN (1.29), highest (9.19) was in November-Ist FN and least (3.01) in the December-Ist FN. Population monitored by White sticky traps started in October Ist FN (1.18) and ended in December-IInd FN (0.11). Highest population was trapped in November-Ist FN (7.08). Water trap did not monitored the thrips population throughout the study period (Table-1). Unlike previous year, similar trend was observed during 2011-12, among the five traps, blue traps were effectively monitored the thrips population from September Ist FN to March-IInd FN than others. Population trap⁻¹ ranged from 3.71 to 496.84. Incidence of thrips was initiated and lowest population was recorded in the September Ist FN (3.71), highest no. trap⁻¹ was recorded in the November-Ist FN December Ind FN.

Table:1 Monitoring of chilli thrips, *Scirtothrips dorsalis* (Hood) population by using different traps during 2010-11

S.No	Month & Fortnight	Types of Trap				
		Yellow (Delta)	Yellow (Hanging)	Blue (Hanging)	White (Hanging)	Water
1	September-I st FN	0.00*	0.00	0.00	0.00	0.00
2	September-II nd FN	0.00	5.07	79.22	0.00	0.00
3	October-I st FN	0.00	18.12	193.74	1.18	0.00
4	October-II nd FN	1.29	23.97	561.42	4.19	0.00
5	November-I st FN	9.19	70.11	922.72	7.08	0.00
6	November-II nd FN	6.74	54.24	729.41	3.22	0.00
7	December-I st FN	3.01	41.95	604.2	1.74	0.00
8	December-II nd FN	0.00	30.14	119.1	0.11	0.00
9	January-I st FN	0.00	15.21	73.6	0.00	0.00
10	January-II nd FN	0.00	8.92	21.9	0.00	0.00
11	February-I st FN	0.00	2.11	2.9	0.00	0.00
12	February-II nd FN	0.00	0.00	0.00	0.00	0.00
13	March-I st FN	0.00	0.00	0.00	0.00	0.00
14	March-II nd FN	0.00	0.00	0.00	0.00	0.00

*Mean no. of thripstrap⁻¹

Table 2. Monitoring and Trapping of thrips, *Scirtothrips dorsalis* (Hood) population by using different traps during 2011-12

S.No	Month & Fortnight	Types of Trap				
		Yellow (Delta)	Yellow (Hanging)	Blue (Hanging)	White (Hanging)	Water
1	September-I st FN	0.00	0.00	3.71	0.00	0.00
2	September-II nd FN	0.00	1.74	8.84	0.00	0.00
3	October-I st FN	0.00	5.64	13.96	0.00	0.00
4	October-II nd FN	4.12	9.79	39.22	0.00	0.00
5	November-I st FN	6.14	15.96	73.16	2.21	0.00
6	November-II nd FN	7.82	23.11	101.54	9.23	0.00
7	December-I st FN	11.04	29.26	292.84	11.84	0.00
8	December-II nd FN	12.11	33.92	496.84	13.29	0.00
9	January-I st FN	7.02	18.14	374.51	10.14	0.00
10	January-II nd FN	2.21	11.05	224.6	9.02	0.00
11	February-I st FN	1.90	5.11	109.4	2.11	0.00
12	February-II nd FN	0.00	0.00	91.28	0.00	0.00
13	March-I st FN	0.00	0.00	56.11	0.00	0.00
14	March-II nd FN	0.00	0.00	12.14	0.00	0.00

*Mean no. of thrips trap⁻¹

Table: 3 Trapping of chillithrips, *Scirtothripsdorsalis* (Hood) population by using different traps during 2010-11

S.No	Month & Fortnight	Types of Trap				
		Yellow(Delta)	Yellow(Hanging)	Blue (Hanging)	White(Hanging)	Water
1	Sept-1-7,2011	0.00	0.00	0.00	0.00	0.00
2	Sept8-15	0.00	0.00	19.22	0.00	0.00
3	Sept 16-23	0.00	2.29	56.99	2.24	0.00
4	Sept24-30	0.00	3.22	98.74	5.23	0.00
5	Oct 1-7	0.00	5.28	119.06	7.43	0.00
6	Oct 8-14	0.00	6.54	187.4	8.33	0.00
7	Oct15-21	5.29	13.67	235.6	9.22	0.00
8	Oct22-28.	7.33	15.98	299.8	10.34	0.00
9	Oct 29-Nov4	12.55	57.22	588.7	11.99	0.00
10	Nov05-11	54.88	70.59	505.3	13.39	0.00
11	Nov12-18	68.72	83.35	388.6	12.1	0.00
12	Nov19-25	42.44	26.52	231.7	10.11	0.00
13	Nov26-Dec02	31.21	20.95	188.6	5.34	0.00
14	Dec03-09	12.2	18.21	173.2	4.12	0.00
15	Dec11-16	2.11	15.22	155.6	3.21	0.00
16	Dec17-23	0.00	12.91	141.3	2.15	0.00
17	Dec24-31	0.00	8.22	105.2	1.25	0.00
18	Jan 1-7,2011	0.00	7.55	93.22	0.00	0.00
19	Jan 8-14	0.00	6.98	82.6	0.00	0.00
20	Jan 15-21	0.00	5.14	63.2	0.00	0.00
21	Jan 22-28	0.00	3.33	44.9	0.00	0.00
22	Jan 29-4 Feb	0.00	2.05	23.8	0.00	0.00
23	Feb 5-11	0.00	1.15	11.6	0.00	0.00
24	Feb 12-18	0.00	0.77	5.99	0.00	0.00
25	Feb 19-25	0.00	0.00	0.00	0.00	0.00
26	Feb26-4 th March	0.00	0.00	0.00	0.00	0.00
27	Mar5-11	0.00	0.00	0.00	0.00	0.00
28	Mar12-18	0.00	0.00	0.00	0.00	0.00
29	Mar19-25	0.00	0.00	0.00	0.00	0.00
30	Mar25-31	0.00	0.00	0.00	0.00	0.00

*Mean no. of thrips trap⁻¹**Table 4. Trapping of chillithrips, *Scirtothripsdorsalis* (Hood) population by using different traps during 2011-12**

S.No	Month & Fortnight	Types of Trap				
		Yellow(Delta)	Yellow(Hanging)	Blue(Hanging)	White(Hanging)	Water
1	Sept-1-7,2010	0.00	0.00	1.98	0.00	0.00
2	Sept8-15	0.00	0.87	3.38	0.00	0.00
3	Sept 16-23	0.00	1.34	4.95	0.00	0.00
4	Sept24-30	0.00	2.97	6.71	0.00	0.00
5	Oct-1-7	0.00	4.55	9.87	0.00	0.00
6	Oct-8-14	0.00	6.88	11.98	0.00	0.00
7	Oct15-21	1.98	7.54	18.54	0.00	0.00
8	Oct22-28.	2.33	8.89	25.56	0.00	0.00
9	Oct 29-Nov4	3.45	11.23	34.88	0.00	0.00
10	Nov05-11	4.98	13.45	46.86	1.54	0.00
11	Nov12-18	5.66	14.98	64.09	3.33	0.00
12	Nov19-25	6.98	19.29	78.67	5.44	0.00
13	Nov26-Dec02	7.56	22.39	99.86	7.98	0.00
14	Dec03-09	8.87	26.34	165.4	12.78	0.00
15	Dec11-16	9.34	29.97	229.76	17.88	0.00
16	Dec17-23	10.98	36.54	342.6	19.74	0.00
17	Dec24-31	12.38	39.71	491.5	23.54	0.00
18	Jan 1-7,2011	9.21	22.61	401.2	15.22	0.00
19	Jan 8-14	7.34	20.52	342.8	10.26	0.00
20	Jan 15-21	5.41	17.34	225.6	8.11	0.00
21	Jan 22-28	3.22	13.89	195.2	5.33	0.00
22	Jan 29-4 Feb	1.98	10.22	146.2	3.12	0.00
23	Feb 5-11	0.54	7.23	131.6	1.22	0.00
24	Feb 12-18	0.12	3.12	102.9	0.67	0.00
25	Feb 19-25	0.00	0.00	86.4	0.00	0.00
26	Feb26-4 th March	0.00	0.00	73.6	0.00	0.00
27	Mar5-11	0.00	0.00	54.8	0.00	0.00
28	Mar12-18	0.00	0.00	44.3	0.00	0.00
29	Mar19-25	0.00	0.00	32.6	0.00	0.00
30	Mar25-31	0.00	0.00	25.7	0.00	0.00

*Mean no. of thrips trap⁻¹

(496.84) and population was terminated in the March-IInd FN (12.14). About other traps, population trap-1 was ranged from 1.74 to 33.92 by Yellow(Hanging) traps, highest no. trap-1 was recorded in the December -IInd FN (33.92) and lowest in November-IInd FN (1.74), population was terminated in the February Ist FN.

Yellow(Delta Shape) traps were trapped the thrips population in the October-IInd FN (4.12), highest (12.11) was in December-IInd FN and least (1.90) in the February-Ist FN. Population trapped by White sticky traps started in November Ist FN (2.21) and ended in February-Ist FN (2.11). Highest population was recorded in December-IInd FN (13.29).

Water trap did not monitored the thrips population throughout the study period (Table 2)

Trapping: Different traps were compared in trapping the thrips population, based on weekly data in 2010-11, among the traps, blue traps were effectively trapped thrips population, highest population (588.7) was recorded in the last week of October and lowest population (5.99) in February second week. Next best traps in trapping thrips population were, Yellow (hanging and delta shape). Yellow (Hanging) trap was trapped from September third week to February second week (0.77), highest population was trapped at November second week (83.35) where as Yellow (Delta) trap , population trapped from October third week (5.29) to December second week (2.11) and highest population (68.72) was at November second week. White trap, from September third week (2.24) to December last week (1.25) population was trapped. Among the five traps, water trap did not trapped thrips population throughout the study period (Table-3). Similar trend was observed in the 2011-12, among the traps tested, blue trap was effectively attracted and trapped highest population (491.5) followed by Yellow (Hanging-39.71), Yellow (Delta-12.38), white (23.54) where as water trap did not trapped thrips population throughout the study period (Table-4). From the two years data, among the different traps, blue traps were effectively monitored and trapped the greater thrips population throughout the crop period it was followed by Yellow traps (hanging and delta). Monitoring and trapping of population was poor in the white colored traps and nil in the water traps. Similar results were reported by Yudin *et al.*, 1987, Finn, 2003, Anca Dafina, 2012, Naime Z. Elekcioğlu, 2013, Chavan 2014, Hameed and Hussein, 2014.

Conclusions

Color of the trap plays important role in monitoring and trapping the population. Blue traps were successful in attracting the population as results in early detection of population and trapping greater population in the season. Other color (yellow, white) traps were also attracted thrips population. This study helps the researchers and farmers to detect and grater population trap at early stage of the crop results in to prevent further spread of viral diseases and reduces the population levels, generations. Ultimately protect the crop and reduces the no.of insecticides sprays leads to ecofriendly methods to manage the thrips in open and poly house conditions.

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