

Integrated Pest Management (IPM) approaches for thrips management*

- + Deep summer ploughing
- + Advance cropping season and avoid staggered planting
- + Growing resistant or early/short duration varieties if available
- + Clean cultivation – maintaining weed free bunds and borders of the crop fields
- + Seed treatment with label claim systemic insecticides
- + Application of well decomposed FYM or compost @ 2t/ha, enriched with *Metarhizium anisopliae* or *Pseudomonas fluorescens* @ 2 kg/t along with recommended doses of FYM (25 to 30 t/ha)
- + Soil application of 500 kg of Neem cake and 1 t of vermi-compost per hectare
- + Balanced fertilization with enhanced potash application along with nitrogen and phosphorous fertilizers
- + Mulching with silver coloured polythene sheets of 25–30 micron thickness
- + Border cropping with 2-3 rows of Sorghum/ Maize/ Bajra/ fodder grasses etc. sown thickly
- + Intercropping chilli with maize/ sorghum and cowpea @ 10:3:1 as a barrier and reservoir for natural enemy multiplication
- + Frequent inter cultivation (earthing up/raking of soil) operations
- + Mechanical destruction of severely infested plants by uprooting and burying
- + Erecting blue sticky traps @ 60–75 traps/ha at crop canopy height for both monitoring and mass trapping purpose
- + Adopting sprinkler irrigation system instead of flood irrigation.
- + Conservation of natural enemies by avoiding spraying of chemical insecticides to the extent possible. Instead, can spray Neem Seed Kernel Extract 5% or Neem oil 0.5% (5 ml/L), Pongamia oil 0.5% (5 ml/L), *Vitex negundo* extract @ 50-80 ml/L, etc. or *Beauveria bassiana* @ 4.00 g or ml/L (spore load - 1×10^8 cfu/g or ml), *Pseudomonas fluorescence* – NBAIRPFDWD @ 20g/L uniformly covering whole plant

Label claim insecticides against thrips in chilli*

Acephate 95% SG @ 1.50 g/L, Acetamiprid 20% SP @ 0.10 g/L, Cyantraniliprole 10.26% OD @ 1-1.20 ml/L, Emamectin benzoate 5% SG @ 0.40 g/L, Emamectin benzoate 1.90% EC @ 0.75 ml/L, Ethion 50% EC @ 2-3.0 ml/L, Fenpropathrin 30% EC @ 0.25-0.30 ml/L, Fipronil 5% SC @ 1.50 ml/L, Fipronil 80% WG @ 0.10 g/L, Imidacloprid 70% WS @ 3-5.00 g/Kg of seeds, Imidacloprid 30.50% m/m SC @ 0.25-0.30 ml/L, Imidacloprid 17.80% SL @ 0.25-0.50 ml/L, Lambda-cyhalothrin 4.90 % CS @ 1.00 ml/L, Lambda-cyhalothrin 5% EC @ 0.50 ml/L, Methomyl 40% SP @ 1.50 ml/L, Oxydemeton-methyl 25% EC @ 2.00 ml/L, Spinetoram 11.70% SC @ 1.00 ml/L, Spinosad 45% SC @ 0.30 ml/L, Spirotetramat 15.31% w/w OD @ 0.80 ml/L, Thiocloprid 21.70% SC @ 0.50 ml/L, Thiamethoxam 30% FS @ 7.00 g/Kg of seeds as seed dresser, Tolfenpyrad 15% EC @ 2.00 ml/L, Diafenthiuron 47% + Bifenthrin 09.40% w/w SC @ 1.25 ml/L, Emamectin Benzoate 1.50% + Fipronil 3.50% SC @ 1-1.50 ml/L, Emamectin benzoate 5% w/w + Lufenuron 40% w/w WG @ 0.10 g/L, Flubendiamide 19.92% + Thiocloprid 19.92% w/w SC @ 0.50 ml/L, Fipronil 7% + Hexythiazox 2% w/w SC @ 2.00 ml/L, Hexythiazox 3.5% + Diafenthiuron 42% WDG @ 1.30 g/L, Indoxacarb 14.50% + Acetamiprid 7.70% w/w SC @ 1.00 ml/L, Profenofos 40% + Fenpyroximate

* Inputs from ICAR—NCIPM

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The Director
National Bureau of Agricultural Insect Resources,
Post Box No. 2491, H.A. Farm Post, Bellary Road,
Bangalore 560 024
Tel: 080-23511982/998/983
Fax: 080-23411961
Website: www.nbair.res.in
Email: director.nbair@icar.gov.in

Invasive chilli thrips: General guidelines for management



Rachana, R. R.¹, Raghavendra, K. V.², Sunil Joshi³
Subhash Chander⁴, Dubey, S. C.⁵ and Ravi Prakash⁶

1 & 3: ICAR - NBAIR; 2 & 4: ICAR - NCIPM; 5. ADG (PP&BS) - ICAR; 6. PPA DPPQ & S



NCIPM

ICAR—National Bureau of Agricultural Insect Resources, Post Box
No. 2491, H.A. Farm Post, Bellary Road, Bengaluru 560 024
ICAR—National Research Centre for Integrated Pest
Management, LBS building, Pusa campus, New Delhi 110 012

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Introduction

Chilli (*Capsicum annuum*) is used as spice, condiment, vegetable in our Indian cuisine and also has value addition in the field of pharmaceuticals, cosmetics and beverages. India is the major producer, exporter and consumer of chillies in the world. The predominant states producing chillies are Andhra Pradesh, Telangana, Karnataka, Tamil Nadu, Maharashtra and to a small extent West Bengal, Uttar Pradesh, Madhya Pradesh and North Eastern states. Major pests hindering the chilli production include mites (*Polyphagotarsonemus latus*, *Tetranychus* sp.), thrips (*Scirtothrips dorsalis*, *Thrips* spp.), fruit borer (*Helicoverpa armigera*), aphids (*Myzus persicae*, *Aphis gossypii*), tobacco caterpillar (*Spodoptera litura*) accounting up to 50–90 % yield loss under favorable conditions. In recent days, chilli farmers of Andhra Pradesh, Telangana, Karnataka, Tamil Nadu and Maharashtra have noticed the outbreak of an invasive insect pest known as South East Asian thrips (*Thrips parvispinus*) resulted in serious crop loss irrespective of the cultivars grown across the chilli belt.

South East Asian thrips, *Thrips parvispinus*

Thrips parvispinus is a cosmopolitan species of quarantine importance and has been reported from Thailand to Australia. The last two decades witnessed a drastic extension in the geographic distribution of *T. parvispinus* and it is now known to occur in France, Greece, Hawaii, Mauritius, Reunion, Spain, Tanzania and the Netherlands, besides India. It is a polyphagous pest, infesting beans, eggplant, papaya, pepper, potato, shallot and strawberry and causes appreciable damage to different crops. In addition, it inflicts injury to ornamentals viz. *Anthurium*, *Chrysanthemum*, *Dahlia*, *Dipladenia*, *Gardenia* and *Ficus*.



Adult congregation on flower

Diagnosis

Females of *Thrips parvispinus* are brownish; legs yellow; forewing brown with pale base. Ocellar setae pair III small and positioned on anterior margins of ocellar triangle. Antennae 7 segmented. Metanotum with median reticulations; median setae long and placed behind anterior margin; without campaniform sensilla. Forewing first and second veins with complete setae rows. Abdominal tergite VIII without posteromarginal comb, a few microtrichia laterally present; pleurotergites without discal setae. Abdominal sternite II with two marginal setae pairs, III–VII with three pairs, VII with median setae pair arising in front of posterior margin; II and VII without discal setae, III–VI with about 6–12 discal setae arranged in an irregular row. Males are uniformly yellow.



Mounted female

Host plants

Since *Thrips parvispinus* is a polyphagous pest, it has a wide host range across different plant families.

Life Cycle

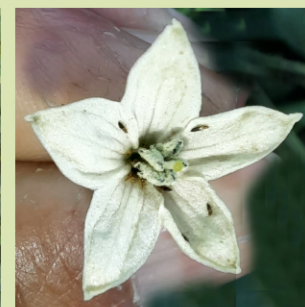
The full cycle takes about 15 days to over a month. Adults live for more than one month producing several generations in a year depending on climatic conditions. The species reproduce both sexually and parthenogenetically. The adult fecundity ranges between 50–69 eggs per female. Eggs are inserted into plant tissue and hatch between 5–8 days depending upon environmental conditions. Upon hatching, the larvae start feeding on plant sap.

Damage symptoms

Both larvae and adults congregate on lower surface of the leaves and lacerate the sap due to which leaves turn reddish brown on the lower surface and yellowish on the upper surface, eventually leading to upward curling of the leaves. As a result, leaves become smaller, thickened and brittle and the plants show severe stunted or abnormal growth. They also feed on terminal parts and growing shoots, buds, flowers and young fruits. On severe incidence, around 15–20 thrips congregate on flowers and feed voraciously and thus result in brownish streaks on petals. The flowers start drying and withering resulting in substantial reduction in fruit set and finally leading to drastic yield loss.



Bronzing symptoms on leaves



Laceration on flower



Bud and fruit damage



Severely damaged plant