



infestation on the crop should be qualitative, based on leaf damage as to low, medium and high instead of counting. Presence of thrips with no symptoms, shiny white oily patches on leaves above mid canopy *vis-a-vis* activity of thrips on the terminal leaves and upward cupping, light to severe browning and stiffness of leaves above mid canopy constitute low, medium and high injury categories, respectively. Sampling to determine the extent of thrips infestation should be carried out in the early morning.

### Pest Management Options:

Management of thrips should be attempted with a view to maintain optimum plant stand during very early crop growth stage. Insecticides of neonicotinoid group such as Imidacloprid and Thiamethoxam applied as seed treatment are efficient in suppressing the population of other sucking pests on cotton seedlings. However, pre-sowing seed treatment with systemic insecticides leads to higher attack by thrips during pre flowering stage, when the weather conditions are conducive for the pest. Therefore, keeping a close watch of crop growth and weather conditions, post emergence sucking pest management should be done on need basis. Even if the population of the thrips is high, insecticidal sprays are of no use when there is likelihood of rains in a day or two that causes natural reduction of thrips. Maintaining weed free conditions in cotton fields from the beginning of crop growth reduces the spread of development of thrips. Insecticidal options should be made when thrips infestation results in high grade injury during clear sky periods with no anticipated

rains. Spray of 5% neem seed kernel extract prepared on farm or crude neem oil spray @ 1% suppresses thrips population during pre squaring crop stage. In both cases detergent / soap powder @ 1 gm/litre of spray fluid is to be added for getting uniform spray suspension. Chemical insecticides such as Imidacloprid 200 SL @ 0.5 ml/lit and Thiamethoxam 25 WG @ 1-1.5 gm/lit of water can be used only when there is high degree of symptoms, indicative of high thrips population. The conventional systemic insecticides should be alternated if more than one spray of systemic insecticides is to be sprayed. Sprays should be undertaken when the population of adults is more. Systemic insecticides are effective for 2-3 weeks. Thrips infestation during reproductive crop growth can be managed using the non-systemic conventional insecticides like Endosulfan @ two ml/ lit of water when applied coinciding with active stages of thrips. The table of the spray volumes for field use at different crop growth stages is given below.

Stage of the crop growth (node number above cotyledonary nodes)*	Required volume of spray fluid (l/ha)	Type of sprayer
< Four nodes	100-125	Hand operated knapsack sprayer
≥ four nodes to ≤ eight nodes	150-200	Hand operated knapsack sprayer
> 8 nodes to ≤ sixteen nodes	200-250	Power sprayer
> 16 nodes	250-300	Power sprayer

\* : Cotyledonary nodes are the first pair of nodes exactly opposite to each other on the main stem

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## Know Your Cotton Insect Pest THRIPS

**Common Name** : Thrips  
**Local Name** : Phulkeede  
**Scientific Name** : *Thrips tabaci* Linde.  
**Family** : Thripidae  
**Order** : Thysanoptera  
**Pest Category** : Sap feeder



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### Description of Insect Stages:

**Egg:** Eggs are minute, kidney shaped laid in slits in leaf tissues.

**Nymph:** Nymphs are creamy to pale yellow in color, resemble adults but wingless.



Thrips nymph

**Adult:** Adults are straw colored, yellowish brown and elongated measuring 1mm in length. Adults are slender and lice like. Antennae have seven segments with the first segment paler the second which is usually dark. A brown band marks anterior edge of the abdominal tergites. There is a single pair of pores on tergite nine.



Wrinkled & distorted seedlings

### Nature of Damage:

Nymphs and adults lacerate the tissue and suck the sap from the upper and lower

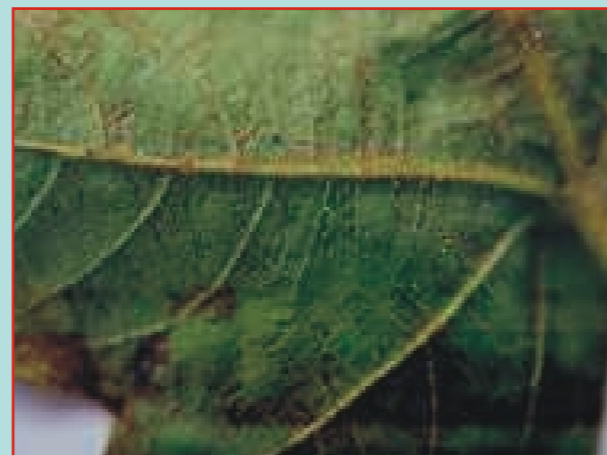
surfaces of leaves. They inject saliva and suck the lysed contents of plant cells resulting in silvery or brown necrotic spots.



Distorted leaf with white shiny patches

### Symptoms:

Seedlings infested with thrips grow slow and the leaves become wrinkled, curl upwards and distorted with white shiny patches. Rusty appearances in patches develop on undersurface of leaves. Thrips infested crop in a field presents rusty appearance from a distance. Higher infestation during vegetative crop growth results in late bud formation. During the fruiting phase there is premature dropping of squares, and the crop maturity is delayed



Rusty appearance on under surface of leaf

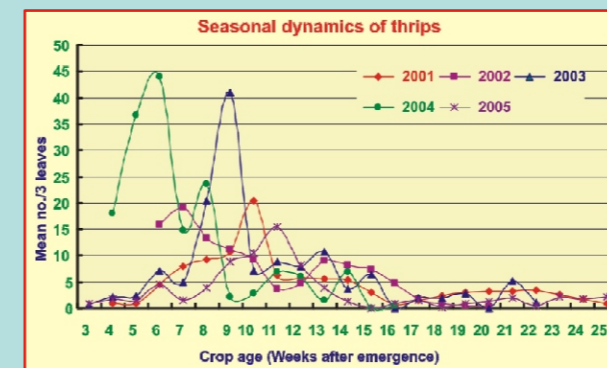
combined with yield reductions. The feeding by thrips on the developing bolls late in the season cause spots or wounds on the pericarp but that do not affect the ripening of the boll or the quality of the seed.



Colony of thrips

### Life History:

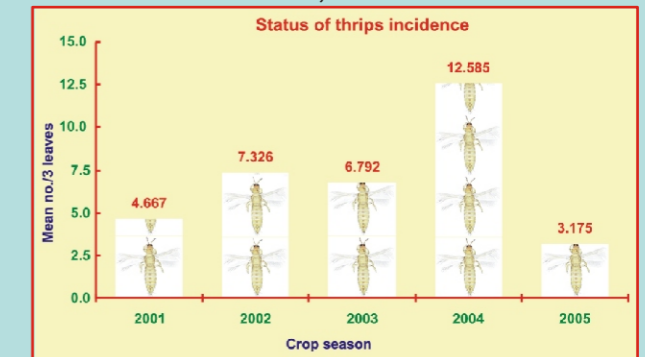
Thrips thrive on the weeds during the off-season and migrate to cotton as soon as the seedlings emerge above ground. Males are rare and the reproduction is parthenogenetic. Eggs hatch in 5 days time, nymphal and pupal period lasts for 5 and 4-6 days, respectively. The preimaginal stage is spent in soil without feeding. The adults survive for 2-4 weeks. Life cycle of *T. tabaci* from egg to adult lasts for 13-19 days and they have about 15 overlapping



generations per year including their development on wild plants. Thrips inhabit on leaves of cotton up to mid season and colonise on bolls during the late season.

### Seasonal Dynamics:

*T. tabaci* occurs alongside of jassids on cotton with no competition and their association is mutually exclusive. However, thrips have negative association with the aphids that are aggregate colonizers. Population density varies highly in relation to crop growth and weather. In the last five cotton seasons, the mean seasonal



incidence has been on the rise but for 2005. Direct relation exists between weediness of the field and the population of *T. tabaci*. In cotton fields of Central India *T. tabaci* has population peaks during July-August months modulated by the rainfall distribution and the dry spells with higher temperatures. Depending upon the seasonal conditions, the number of generations range between four and seven. Temperatures of 35°C are much more favourable for the development of *T. tabaci*. Relative humidity of 54 % or less is optimal for the population development. Frequent rains and prolonged cool weather reduces the population of thrips drastically. Determination of the level of thrips