

is in the field. High temperature and scanty rainfall situations aggravate the severity of the pest.

Pest Management Options:

Whitefly management should be achieved when their populations are at low levels through cultural practices. Maintenance of good field sanitation by destroying and removing the crop residues, and weeds is an effective practice against whiteflies. Growing vegetables in short periods and allowing maximum time between host crops of whitefly reduces its pest status on cotton. Combination of cultural practices and need based insecticidal applications keep a check of whitefly populations. Repeated applications of insecticides during early and mid seasons lead to resurgence of whiteflies, and hence a highly judicious chemical application is a must. Neem oil (1%), fish oil resin soap (2.5%) and neem seed kernel extract (NSKE) 5% give effective control of whiteflies. Triazophos 40 EC @ 600 g a.i./ha, Ethion 50 EC @ 1000 g a.i./ha and Acetamiprid 20 SP @ 30-40 g/ha are effective against whiteflies. More than 25% of leaf coverage by the whitefly pupae on the under surface of leaves of middle plant canopy and flight of white adults visible on a single stroke of the plants should be used to decide the insecticidal applications. The severity of whiteflies is seen after the crop growth crosses 10 nodes on the main stem. Therefore, the amount of spray fluid while spraying the insecticides should be greater than 250 l/ha using power sprayers. Proper coverage of underside of leaves during the insecticidal sprays effectively reduces the whitefly population.

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Know Your Cotton Insect Pest WHITEFLIES

Common Name	: Whiteflies
Local Name	: Pandhari Mashi
Scientific Name	: <i>Bemisia tabaci</i> Genn.
Family	: Aleyrodidae
Order	: Hemiptera
Pest Category	: Sap feeder



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Description of Insect Stages:

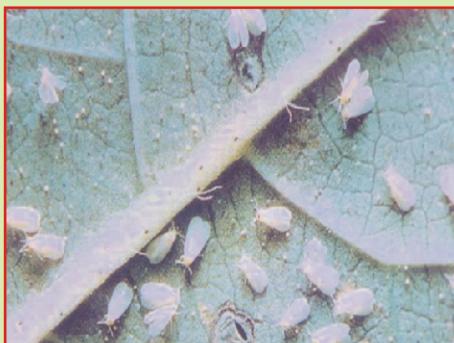
Egg: Eggs are yellowish white laid singly on the under surface of leaves. They are stalked and sub elliptical in shape.

Nymph: Nymphs are yellowish and brownish, sub elliptical and scale like. They are found in large numbers on underside of leaves. Pupae also resemble nymphs in shape and have brownish opercula.



Whitefly nymphs & pupae

Adult: Adults are tiny and white in color. They have a yellow body dusted lightly with a white waxy powder. Females are 1.1- 1.2 mm long;



Whitefly adults

males are slightly smaller. Antennae of females are longer than males. Hind legs are larger than anterior pair of legs. Genitalia of female consists of outer and inner vulvulae that are rounded. Parameres of males are extended, narrow and pointed. Large

numbers of adults are found in middle region of the plant.

Nature of Damage:

Whiteflies cause damage to cotton plants in two ways firstly by sucking the sap and secondly by



Sooty mould growth on leaf

excreting honey dew on which sooty mould grows. Damage from direct feeding reduces the photosynthetic activities of the plant and hence the yield. Indirect damage results from lint contamination with honeydew and associated fungi and through transmission of leaf curl virus disease. Late season severity affects the seed development and the lint quality.

Symptoms:

Leaves curl upwards and the plant vigour reduces. Leaves become shiny with honeydew or darkened by sooty mould growing on honeydew. Lint



Leaf curl virus disease



Lint contamination with honeydew

contamination with honeydew and associated fungi occur during heavy infestations after boll opening.

Life History:

The female whitefly lays the eggs singly on the under surface of leaves and mostly on the top and middle crop canopy. Each female is capable of laying about 120 eggs. The incubation period varies from 3-5 days during spring and summer, 5-17 during autumn and >30 days during winter. The nymphs after hatching fix themselves to the underside of the leaves and they moult thrice before pupation. The nymphal period varies from 9-14 days during summer, and 17-19 days during winter. The pupal period is 2-8 days. The total life-cycle range from 14 to 107 days depending upon the weather conditions. There are about 12 overlapping generations in a year and the pest also reproduces parthenogenetically at times. Whiteflies have extremely wide host range.

Seasonal Dynamics:

The period of activity of whiteflies lasts from the emergence of seedling to the full grown crop. During the end of cotton season the adults migrate to other crops such as crucifers, cucurbits and malvaceous plants. They migrate to new season cotton crop as soon as it