

Spider Mites: Two-spotted Spider Mites:
Carmine Spider Mites
Other Mite Species:

Tetranychus urticae
Tetranychus cinnabarinus
Tetranychus spp.

Although several different species of spider mites can potentially occur on cotton, the two-spotted spider mite, *Tetranychus urticae*, is the most common. Adult spider mites are barely visible to the naked eye, approximately 1/32 of an inch in length or less. Sub-economic populations of spider mites are normally present in most fields, but the occurrence of economically damaging infestations is relatively uncommon. However, when heavy populations of mites do occur they can cause significant damage. Spider mites are often considered secondary pests because infestations can be flared by applications of broad-spectrum insecticides applied to control other pests, but hot, dry environmental conditions can also favor mite outbreaks.

Historically, spider mites were a more consistent problem during the late 50s and 60s than they were during the 70s through early 90s. However, although, spider mites continue to be a relatively uncommon problem, there has been a notable increase in occurrence in recent years. This may possibly be associated with increased adoption of transgenic herbicide resistant plants and reduced tillage systems. Such systems often allow higher weed populations to remain in the field after planting and during early seedling development. Although these weeds are ultimately controlled by post-emergence herbicide applications, they can provide a source for early season spider mite infestations.

Biology: Spider mites are not insects; along with spiders and ticks, they belong to the Class Arachnida, which is closely related to insects. The translucent, globular eggs, which are normally deposited on the undersides of leaves, hatch into a 6-legged larva, which molts into an 8, legged nymph. There is one additional nymph stage, before the mite becomes a mature, eight-legged adult. Female mites lay approximately 100 to 300 eggs each. Under optimum conditions, spider mites may complete a generation in 8 to 12 days, but generation time can be considerably longer during cooler weather or under less optimal conditions. Most mites are found on the undersides of leaves, where they tend to congregate next to larger leaf veins and at points where leaf veins intersect. When infestations are moderate to heavy, a fine webbing may also be present at these sites. When infestations are extremely heavy, mites may be present on the upper surfaces of leaves as well, and the webbing may be quite conspicuous.

Hot, dry conditions are generally favorable to spider mite development, and heavy infestations often occur during periods of drought, when plants can least tolerate the additional stress. Wet or humid conditions are less favorable to spider mite development. High relative humidity is known to interfere with the mite's molting process. However, spider mite populations are also subject to epizootics of fungal diseases, which are more prevalent under wet or humid conditions.

Spider mites overwinter as hibernating females, hiding in sheltered sites on plants and in plant debris. Mites have a large number of alternate hosts and begin increasing their populations on these hosts early in the spring. Although spider mites are wingless, their small size allows them

to be easily transported by wind, and mites can use the silk webbing that they produce to aid in wind-assisted transportation. Early spider mite infestations in cotton are often concentrated in portions of the field that are adjacent to field borders or non-cultivated areas that project into fields. In reduced tillage situations, spider mite infestations can also develop due to movement from in-field weed hosts, which can result in more widely scattered infestations. Spider mite infestations also tend to be more common along dusty roads and turn rows where plants become covered with dust.

Damage: Because of their small size, the damage caused by an individual mite is inconsequential, but the cumulative damage caused by heavy infestations can be quite severe. Spider mites have piercing-sucking mouthparts, which they use to puncture and feed on individual leaf cells. Heavy feeding results in the loss of plant nutrients, which would otherwise be used for plant growth and development, and physical damage to the leaf, which reduces photosynthetic ability. Early symptoms of mite infestation are a fine "stippling" of small bleached or yellow spots that are visible through the upper surface of the leaf. Initially, this stippling may be more concentrated along the major leaf veins, but under heavier infestations the entire leaf may be involved. Under prolonged, severe infestations the leaves become more yellow and then redden. Severe infestations can result in premature defoliation. Growth and development of heavily infested plants is severely reduced.

Yield Effects: Severe infestations of spider mites are capable of reducing lint yield by several hundred pounds. Over the past five years estimated statewide yield reductions attributed to spider mites have ranged from 0.06 to 0.11%.

Control: When spider mites are a problem during dry periods, irrigation, or timely rainfall, can help increase plant vigor and tolerance and may affect mite populations. However, when populations exceed the economic threshold, treatment with a specific miticide is recommended. Treatment is recommended when mites are present on 50% or more of the plants checked (based on examination of 5th leaf below terminal). Pesticides recommended for control of spider mites are shown in Table 7. Depending on the material being used, successful control of heavy spider mite infestations may require two successive applications at approximately five-day intervals. This is because many treatments are not active against the egg stage and because the residual control provided by most miticides is relatively short.

Table 7: Insecticides Recommended for Control of Spider Mites

Insecticide	Trade Name	Lbs ai/acre
Bifenthrin *	Capture	0.06 to 0.1
Dicofol	Kelthane	1.00 to 1.50
Fenpropathrin *	Danitol	0.2 to 0.3
Propargite	Comite	1.23 to 1.64

* These products require two consecutive applications at 5-day intervals.

Source: Cotton Insect Control Guide, 2003, Publication 343, Mississippi State University Extension Service



Spider Mites: Two-spotted spider mite is one of the more common of several species of mites that attack cotton. Mites are not insects, but are closely related.