



Two-Spotted Spider Mites in Soybeans

Key Points

- Two-spotted spider mites are a pest of soybeans that show up during extended periods of drought.
- Spider mites damage soybeans by piercing plant leaves and feeding on the plant juices.
- There are no established economic thresholds for two-spotted spider mites.
- Effective chemical control of spider mites is challenging due to the limited efficacy of treatments, short residual period, and detrimental effect on natural predators.

Spider Mites – A Problem in Drought Years

Two-spotted spider mite (*Tetranychus urticae*) is a pest of soybeans that proliferates during extended periods of drought. Drought conditions accelerate spider mite movement and reproduction and inhibit fungal pathogens that normally help keep spider mite populations in check. Economically damaging outbreaks of spider mites are relatively rare, but populations can grow rapidly when conditions are favorable.



Two-spotted spider mite adult.

Two-Spotted Spider Mite Lifecycle

Two-spotted spider mites have four stages of development: egg, larva, nymph and adult. Spider mites overwinter as adults in field edges and roadsides bordering fields, feeding on weeds until spring. After early spring mating, female spider mites lay eggs on weeds that usually hatch to the larval stage in 3 to 5 days. Unlike most damaging insects in soybeans, spider mites do little feeding during the larval stage of development.

Nymphs are young eight-legged mites that resemble full-size adults but do not yet have reproduction capability. Adults are very small at only 1/60 (female) to 1/80 (male) inch in size when fully developed, with females laying an average of 50 to 100 eggs during their lifetime.

The entire life cycle of this pest can be completed within 5 to 14 days, depending on environmental conditions. Fastest reproduction occurs when temperatures are over 85 °F (29 °C) and weather conditions are dry. During heavy outbreak years, all stages of mites may be present in the field at one time. Two-spotted spider mites have the potential for up to 10 generations per year during the growing season.



Soybean leaves showing spider mite feeding symptoms.

Spider Mite Damage to Soybeans

Two-spotted spider mites damage crops by piercing plant leaves and feeding on the plant juices with their mouth parts. Mites suck on the bottom sides of soybean leaves and remove moisture and nutrient contents from plant cells, resulting in a yellow or whitish spotting on the top side of the leaf surface. In heavy infestations, a common visual symptom of spider mite feeding is leaf burning and stippling.

Hot spots will typically be noticed first on field margins, as infested plants take on a wilted appearance. Drought-prone fields or field areas that contain lighter soils or sands are often affected first by spider mites. As populations increase, spider mites will move out across the entire field if left unchecked. Fields heavily infested by mites can cause premature leaf drop and significant reductions in yield.

Populations of spider mites increase significantly during extended hot, dry conditions. This is due to a reduction in predators and naturally occurring pathogenic fungi that keep populations at non-economic levels in normal years.



Spider mite eggs on underside of soybean leaf. Spider mite infestations are more common under hot, dry, drought stressed conditions.

Spider Mite Scouting and Economic Thresholds

Look on the undersides of affected soybean plants and leaves for mites, eggs and webbing in the lower canopy. Mites are almost impossible to see with the naked eye, so doing a simple “paper test” is a quick and easy way to confirm their presence. Shaking the plant onto a white piece of paper should allow you to see the tiny orange- to yellow-colored mites slowly moving on the paper.

There is currently limited information regarding potential economic threshold for two-spotted spider mite infestations in soybeans, which makes treatment decisions challenging. Some extension sources suggest treating for spider mites if 20 to 50 percent of the leaves are discolored before pod set. After pod set has begun, the suggested treatment threshold is 10 to 15 percent of the leaves discolored.



Soybean leaves showing spider mite feeding symptoms.

Consideration for treatment of two-spotted spider mite should take several factors into account:

- Are there other insect pests present that cause economic injury (such as soybean aphids, bean leaf beetles, and grasshoppers?)
- What are the weather trends? If heavy rains and moderating temperatures occur, mite populations may be reduced or contained in the short term.
- Are there thrips, pirate bugs, mite destroyer beetles, and/or naturally occurring fungi in the field? Under proper conditions these beneficials can significantly reduce or limit populations of two-spotted spider mites.
- Is the outbreak confined to field edges or borders? If mite outbreaks are caught on outside field edges before they have a chance to move across the entire field, spot treatments or treating field margins might head off the need for whole field treatments. If scouting reveals that mites have spread across the field, then whole field protection will be necessary.

If hot and dry weather persists, spider mites will continue to build, and it will be important to control them. Field scouting is necessary for detection of early outbreaks and for effective early treatments and control.

Treatment and Control

Chemical control of spider mites is challenging. While some pyrethroid products may suppress activity of spider mite, nearly all the synthetic pyrethroid products have a detrimental effect on spider mite predators. The lack of full control by pyrethroids allows mite numbers to increase unchecked or “flare up” when conditions are favorable.

Spider mites, like other soybean insects, are found on the undersides of soybean leaves. For optimal control of spider mite populations, use high pressure and a high volume of carrier to achieve thorough coverage and penetration of the crop canopy. Using higher pressures, (40 to 60 psi) and increased carrier volume (15 to 25 gpa) will improve overall performance.

Unfortunately, residual control of most treatments is short-lived, and applications will only control adults and nymphs. Treated fields need to be re-scouted five to ten days following application. It is possible that a second application might be necessary to pick up any newly hatched spider mites, so be sure to scout treated fields about a week after application.

Conditions can change quickly depending on environmental conditions. Heavy rainfall, or changes in temperature, humidity or crop conditions may warrant a re-evaluation of mite populations before treatments are made.

The foregoing is provided for informational use only. Please contact your Pioneer sales professional for information and suggestions specific to your operation. Product performance is variable and depends on many factors such as moisture and heat stress, soil type, management practices and environmental stress as well as disease and pest pressures. Individual results may vary. FF210917

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