Western States - Management of Spider Mites in Silage Corn

- Spider mites can significantly reduce the yield and quality of silage corn.
- Outbreaks of spider mites are common in hot, dry conditions, particularly on drought-stressed corn.
- Prevention includes proper irrigation to avoid drought stress, and maintaining populations of beneficial insects.
- Miticides, applied when economic thresholds are reached, can help to control infestations and protect silage quality and yield potential.

Spider Mites Commonly Found on Corn
Spider mites thrive on corn grown in high temperatures and low humidity conditions. They are typically not a problem in the eastern Corn Belt states, but can be troublesome in many western states. Spider mites can significantly reduce the yield and quality of silage corn, requiring management strategies to prevent high populations from developing.

There are many species of spider mites that can attack different plants, and two different species of spider mites are commonly found on corn:

Two-spotted spider mite (TSM) - Tetranychus urticae

The TSM is the most common species on corn in the Central Valley of California.1 Adult TSM are yellow with two irregularly-shaped dark spots on the abdomen (Figure 1). This species is often found in corn near a neighboring alfalfa field, and infestations usually occur sporadically throughout a corn field. TSM overwinter in sheltered areas such as field margins.

Banks grass mite (BGM) - Oligonychus pratensis

BGM is the second most important species in western corn states, and are the most common in many areas. Adult BGM males are dark green with a pointed abdomen, while adult BGM females are larger with a more rounded abdomen (Figure 2). Infestations often begin near the edges of the corn field adjacent to other grasses, such as wheat, where BGM overwinter. As these grasses start to dry down, BGM will relocate to the neighboring corn field.

Spider Mite Life Cycle
Both species overwinter as females. When the weather warms, females lay pearly-white, spherical eggs. The egg hatches into a 6-legged translucent larval stage, followed by two 8-legged nymphal stages (protonymph and deutonymph), and ending as an 8-legged adult. The adults are very small, with females larger than males. A female adult can lay as many as 100 eggs. A generation can take as little as a week to occur under rapid growth conditions. Spider mite populations can increase 70-fold in one generation, and build very quickly under ideal conditions.2

Feeding Damage
All active stages of spider mites damage corn by removing juices from infested leaves, causing premature drying that results in loss of leaf tissue, stalk breakage, and kernel shrinking.3 Spider mites feed on the undersides of leaves, resulting in leaf discoloration characterized by yellow or whitish spotting (stippling) across the surface of the corn leaf (Figure 3). Damaged leaves become stippled on the upper surface and grayish due to webbing on the under-surface.
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Scouting
Scout field edges where mite outbreaks are most likely to begin. Continue in 5 to 10 locations throughout the field, examining lower, middle, and upper leaves for stippling. Spider mites produce a fine network of silken webs on the undersides of the leaves that can be easily seen under low magnification. Using a magnifying glass, check the undersides of leaves for adult mites and webbing.

Spider mite infestations usually begin on the lower corn leaves and move upward as mite numbers increase. Mites affecting corn thrive under sunny, hot, dry, and dusty conditions. Evaluating infestations can be most efficient by looking at older, lower leaves and inspecting for stippling on the upper surface and webbing, mites, and feeding scars on the lower surface. Mite infestations that reach the ear leaf can be the most damaging to corn.

Identifying the species of spider mite that is predominant in a field can be important. Miticide resistance is widespread in both TSM and BGM populations, particularly in regions with long histories of miticide use. Resistance to specific miticides differs between the two species, so it is important to determine which species is present in the field prior to spraying. In some fields, both species may be present at the same time, in which case, a treatment targeted towards BGM could result in a greater infestation of TSM due to reduced competition. BGM is generally more susceptible to miticides than TSM, except where resistance has developed. A grower’s best option is to consult with an Extension entomologist and/or local agronomist before choosing a product to determine if resistance has developed to any of the commonly used miticides.

Prevention
Spider mite outbreaks can be common in hot, dry conditions, particularly on drought-stressed corn. Proper irrigation to help avoid drought stress is a key cultural practice to control or prevent outbreaks. Keeping fields, field margins, and irrigation ditches clean of weed hosts helps to reduce spider mite problems. Reducing dust can also help to reduce the spider mite problem. Natural enemies, including predatory mites, lady beetles, minute pirate bugs, lacewing larvae, thrips, and fungal diseases, normally keep spider mite populations in check. However, spider mite populations can flare when pesticides, applied for control of other corn pests and diseases, kill the natural enemies, particularly when hot, dry conditions coincide with the treatment. The use of broad spectrum insecticides should be avoided if possible to maintain beneficial insect and predatory mite populations. Planting corn products with insect protection traits can help to minimize the need for insecticide applications. If an insecticide application is necessary, consider including a miticide in the application if spider mite colonies are already present.

TREATMENT GUIDELINES
Treatment thresholds for control of spider mites in corn can be different across states. In California, scouting is recommended when corn is small, and if spider mites are found, application of a miticide is recommended when a ground spray rig can still go through the field. Application after corn has reached 4 feet in height can result in poor control due to reduced spray coverage. Sometimes spraying only a couple of swaths around the field can prevent spider mites from spreading into the remainder of the field. Other states may recommend to consider treatment when the lower 1/3 of the corn plants show damage, spider mites can be found on the middle third of leaves, and the corn is not yet at hard dough stage (R4). Once the crop has reached the kernel dent stage (R5), there will likely be no economic benefit from treatment.

Treatment of spider mites on corn is usually justified under the following conditions:

- Extensive colonies of live mites are present on the leaves throughout the field, not just along the edges or in dry locations.
- There is visible leaf damage near the ears.
- There is a good probability of continued water stress to the plants.

A preventative pre-tassel miticide treatment may be beneficial if:

- The field has a history of spider mite problems.
- Temperatures are expected to top 95°F.
- Plants are drought-stressed.
- The field has received previous insecticide applications that may have reduced natural enemy populations.
- Mites are being detected on a majority of the plants early in the growing season.

A field survey should be conducted before and after a miticide is applied to evaluate the efficacy of a treatment. Closely examine 25 infested leaves and mark them so that the same leaves are reexamined after treatment. If a treatment is effective, no live adult mites should be found. However, eggs present during a treatment may not be killed (most miticides do not kill the eggs) and may begin to hatch, resulting in a new generation of immature mites. In some cases, retreatment may be necessary before immature mites become adults and begin laying eggs.

SOURCES:

Individual results may vary, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible. ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. Asgrow®, DEKALB® and Design® are registered trademarks of Monsanto Technology LLC. Deltapine® and Leaf Design® are registered trademarks of Monsanto Company. ©2014 Monsanto Company. 05072014TED

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