A4169

CRANBERRY False Blossom

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False blossom results in **yield loss** by causing flowers to abort in the year that symptoms appear and by **reducing or eliminating bloom** in subsequent years.

Infected vines do not recover; once infected, they remain diseased and **do not bear fruit**.

Cranberry false blossom was a limiting factor in cranberry production in Massachusetts, New Jersey, and Wisconsin in the early 1900s until about 1940. It was rarely seen in the second half of the twentieth century, but it reemerged in the early 2000s in New Jersey and in the 2010s in Massachusetts and Wisconsin. False blossom has been observed on the cultivated large American cranberry (*Vaccinium macrocarpon*) and the small cranberry (*V. oxycoccus*). False blossom results in yield loss by causing flowers to abort in the year that symptoms appear and by reducing or eliminating bloom in subsequent years. Infected vines do not recover; once infected, they remain diseased and do not bear fruit.

False blossom is caused by a **phytoplasma**, which is a single-celled microorganism similar to a bacterium but lacks a cell wall. Phytoplasmas infect a wide range of plants and live in the phloem, the sugar-conducting tissue of plants. There are at least two genetically distinct phytoplasmas associated with false blossom. It is not known if other plants, such as weeds, harbor the phytoplasmas that infect cranberry.

Symptoms

Cranberry false blossom exhibits various symptoms, but they are not all necessarily observed on infected plants. Flower parts are dark pink or streaked with red and are borne on erect rather than arched pedicels (flower stalks) (figures 1A and 1B). The stamens (male flower parts) and pistils (female flower parts) are abnormal in form and color, or stamens may be absent (figure 1A). In some cases, pistils are retained after petals drop (figure 1C). Berries either abort or are small, green, and misshapen (figure 1D).

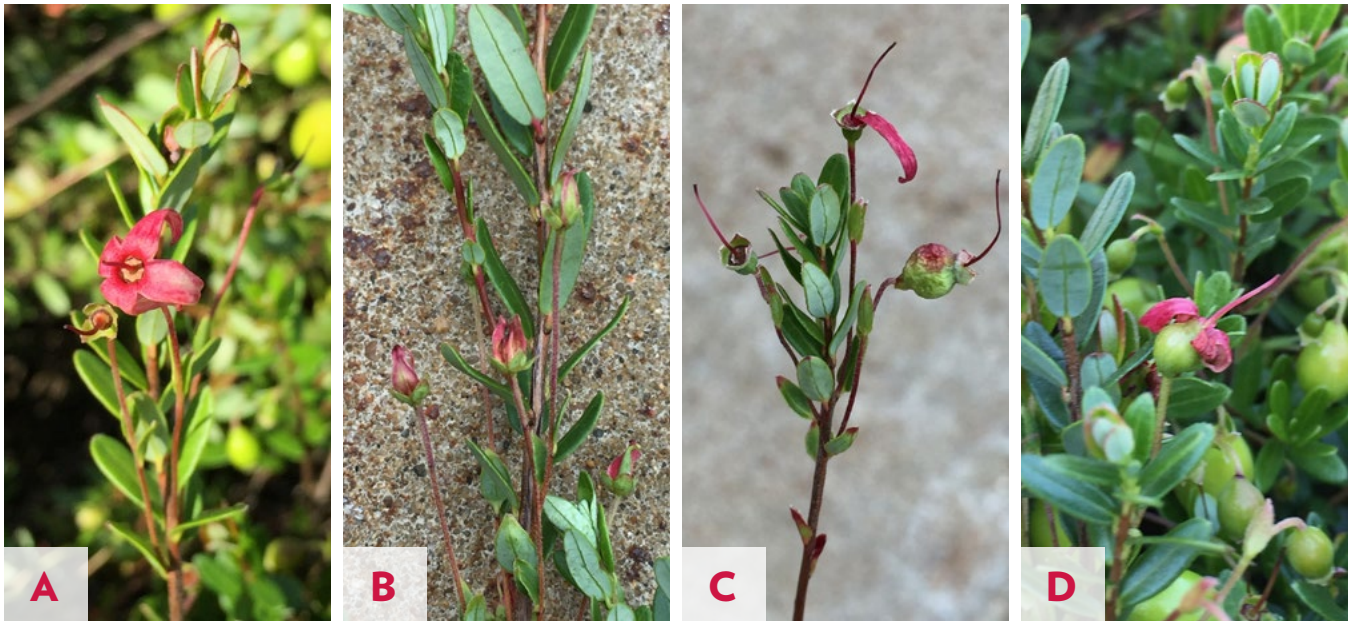

FIGURE 1. Cranberry false blossom symptoms on flowers and fruit.

FIGURE 2. Cranberry false blossom symptoms on leaves and shoots.

Leaves are small and are folded close to stems, and uprights are closely spaced, creating a "witch's broom" (figure 2A). Infected vines extend above the canopy, have few or no berries, and turn red prematurely in the fall (figure 2B). Terminal buds on infected plants are enlarged and prone to winter injury.

Sources and spread of false blossom

Because the false blossom phytoplasma persists in plants from year to year, it can be introduced into new locations on vines or plugs used for propagation. Once established in a planting, the **blunt-nosed leafhopper** (*Limotettix vaccinii*, formerly *Scleroracus vaccinii* or *Euscelis striatulus*; figure 3) picks up the false blossom pathogen when it feeds on the phloem of infected cranberry plants, and then spreads the pathogen when it feeds on other plants. *L. vaccinii* is believed to be the only species of leafhopper that spreads false blossom. Symptoms develop within one month after infection or may take years to develop. Scattered diseased plants can go unnoticed or misdiagnosed for several years, making it difficult to pinpoint the origin of the pathogen and time of infection. The parasitic plant dodder can transmit the false blossom phytoplasma from plant to plant, but the role of dodder in spreading disease in the field is probably negligible. Phytoplasmas require living tissue to survive and multiply and will not persist in dead plants, soil, or water. Therefore, the pathogen is not carried in irrigation or harvest water.

Management

Introduction of false blossom can be prevented by planting pathogen-free nursery stock and vines. Where false blossom occurs, its spread can be minimized by controlling the blunt-nosed leafhopper. Thresholds have not been determined for blunt-nosed leafhopper, and insecticides should be used with care to avoid harming pollinators. If an area of a bed is heavily infected, vines should be removed and replanted with pathogen-free vines. The blunt-nosed leafhopper prefers some varieties (e.g., Howes, Centennial) to others (e.g., Early Black, McFarlin, Stevens), but the attractiveness of newer varieties and their relative susceptibility to false blossom has not been determined.

Diagnosis

The University of Wisconsin–Madison **Plant Disease Diagnostics Clinic** (pddc.wisc.edu) tests for the false blossom pathogen by sequencing DNA extracted from plants. The DNA sequence is then compared to sequences in a database that includes DNA from all types of pathogens, including phytoplasmas. The ability to detect DNA of the false blossom phytoplasma in various tissues at different times of the year has not been tested. Therefore, it is best to submit entire plants, including roots, when attempting to diagnose false blossom.

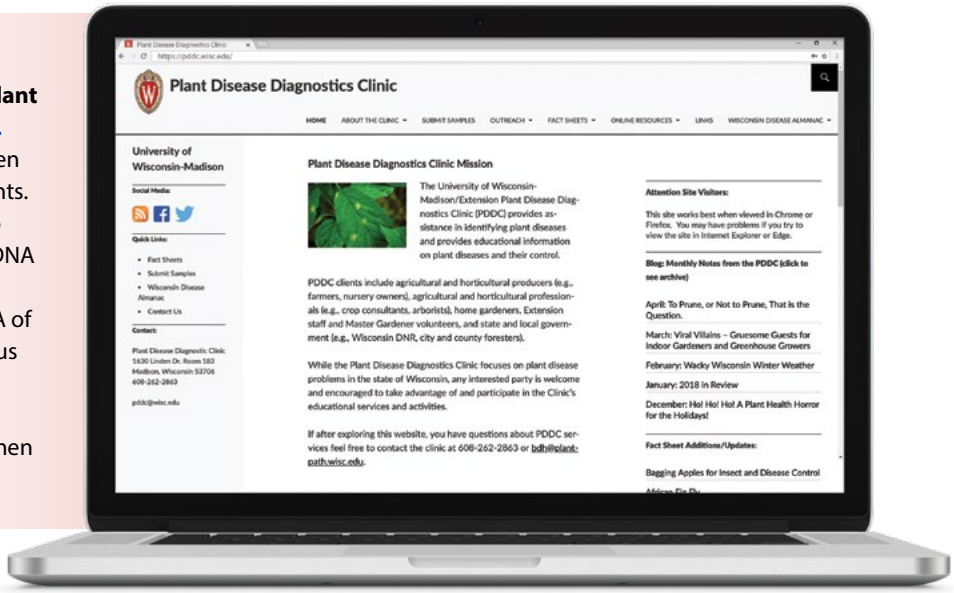

FIGURE 3. Blunt-nosed leafhopper nymph (A) and adult (B).

More information

View detailed publications about cranberries at the UW–Madison Division of Extension Learning Store (**learningstore.uwex.edu**):

- *Blueberry Shock Virus in Cranberry* (A4147)
- *Cottonball Disease of Cranberry* (A3194)
- *Cranberry Fruit Rot Diseases in Wisconsin* (A3745)
- *Cranberry Stem Gall* (A3795)
- *Fungal Leaf Spot Diseases of Cranberry in Wisconsin* (A3711)
- *Tobacco Streak Virus in Cranberry* (A4110)
- *Protecting Pollinators and Improving Pollination on Wisconsin Cranberry Marshes* (A4155)

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Photos: Figures 1 and 2 courtesy of Lindsay Wells-Hansen, Ocean Spray Cranberries, Inc. Figure 3 courtesy of Elvira de Lange, Department of Entomology, Rutgers University, Rutgers Cooperative Extension Fact Sheet FS1248 (**https://njaes.rutgers.edu/fs1248/**).

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