

Strawberry Green Petal Disease

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The University of Vermont Extension has been scouting strawberry fields across Vermont (VT). A localized report in Alburgh observed plants showing symptoms of Strawberry Green Petal Disease (SbGP). Although incidence is generally low, cases have been rising over the last decade just north of VT in Quebec, Canada (Plante et al., 2024).

The SbGP is an insect-vectored disease. The pathogen is primarily transmitted by leafhoppers (Figure 1A), both *Aphrodes bicinctus* and *Macrosteles quadrilineatus* have been confirmed as vectors (Santos et al. 2025). The causal agent is associated with a group of phloem-restricted plant pathogenic bacterium belonging to the phytoplasma group, *Candidatus*. This group is also known to cause clover phyllody (Figure 2). While leafhoppers are the primary transmission route, the pathogen can also be propagated through runners and clonal propagation from infected mother plants, posing an additional risk for spread within and between fields.



Figure 1: A, *Macrosteles quadrilineatus* is one of the leaf hopper species known to transmit SbGP (Santos et al., 2025). B, strawberry plant showing symptoms of SbGP.



Figure 2: Clover phyllody symptoms (Santos et al. 2025).



Figure 3: Strawberry fruit showing degrees of symptoms of phyllody (Brochu et al., 2021).

Symptoms of Strawberry Green Petal Disease (SbGP)

Plants infected with SbGP typically show the following symptoms:

- Stunting of overall plant growth
- Development of numerous tiny shoot branches with small leaves, known as Witch's Broom. Leaves may turn red as well.
- Flowers turn from white to green sometimes with red margins
- Abnormal fruit-like structures develop from flowers
- Presence of phyllody – a condition in which floral organs are replaced by leaf-like structures, giving fruit an unusual leafy appearance

These symptoms are most visible during the flowering and fruiting stages and are key indicators for field diagnosis of SbGP.

Disease Cycle of Strawberry Green Petal Disease (SbGP)

Symptoms of SbGP typically appear during the fruiting period in spring and summer, primarily in first- and second-year strawberry fields. Phytoplasma diseases can often be fatal and produce inedible fruit (The Royal Horticultural Society, 2025). As illustrated in Figure 5, the disease cycle involves both plant and insect hosts:

- **Acquisition Period:** Leafhopper adults and nymphs acquire the phytoplasma by feeding on infected strawberry plants. During this stage, the pathogen enters the insect's gut.
- **Latency Period:** After acquisition, the phytoplasma undergoes a latency period within the insect. It colonizes the intestinal tract and subsequently migrates to the salivary glands.
- **Inoculation Period:** Once in the salivary glands, the insect becomes capable of transmitting the pathogen. Transmission occurs during phloem feeding, when the leafhopper injects saliva containing the phytoplasma into healthy host plants.

- **Symptom Development:** Following inoculation, it may take up to 36 days for symptoms to become visible in the infected plant.

The disease cycle in Figure 5 highlights the importance of vector management and early detection in disease prevention.

Management of Strawberry Green Petal Disease (SbGP)

Currently, there are no specific control methods available for SbGP. However, integrated management practices can help reduce disease incidence and spread:

- **Scouting and vector control:** Regular field monitoring and control of leafhopper populations are the primary strategy for disease management.
- **Rogueing infected plants:** Prompt removal of symptomatic plants reduces the local inoculum and potential for further spread.
- **Crop rotation:** Although strawberries are typically grown for only 2–3 years, minimizing the carryover of infected material through rotation out of strawberries may help reduce inoculum levels.
- **Propagation material:** Use only certified disease-free clones and runners to prevent initial introduction of the phytoplasma into new fields.
- **Chemical and biological control:** While chemical controls for leafhoppers may reduce vector populations, no economic threshold has been established for strawberries. No studies have evaluated the efficacy of biological control agents against leafhoppers in strawberry production to date.
- **Cultural practices:** Weed management is important, as weeds may serve as alternate hosts and phytoplasma reservoirs, supporting both vector and pathogen survival.

Note: Phytoplasmas overwinter within the insect vector or the perennial host plant. They cannot survive outside of the vector or host plant. More research is still needed regarding this phytoplasma system and management practices.



Figure 4: Strawberry plant showing characteristic symptoms of SbGP.

Strawberry Green Petal Disease Cycle

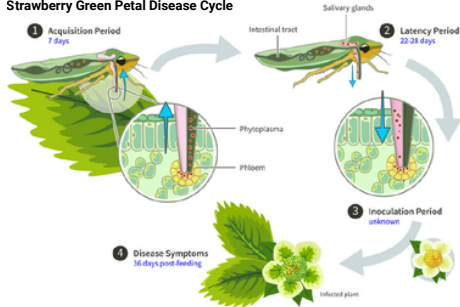


Figure 5: Strawberry Green Petal Disease Cycle (Santos et al., 2025).

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