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IPM Fact Sheet Series**UMass Extension Fruit Team**

Fact Sheet #AI=004

**Apple – Leafhoppers: Potato leafhopper (*Empoasca fabae*), white apple leafhopper (*Typhlocyba pomaria*), rose leafhopper (*Edwardsiana rosae*)****Overview**

White apple leafhoppers (WALH) and rose leafhoppers (RLH) feed on the underside of leaves producing small, whitish spots on the upper leaf surface. This "stippling" may cover the entire leaves and appear silvery. Leafhopper feeding can reduce tree vigor, but of more concern is the accumulation of LH excrement on apple surface. The LH leave dark, "tar spots" and is difficult to remove.

Potato leafhoppers (PLH) do not overwinter in here, but migrate north with summer storms, usually reaching New England in mid June. PLH feed primarily on immature leaves and actively growing shoots in outer part of canopy. Leaves injured by PLH feeding turn yellow on edges, cup upward, and later turn brown or scorched. On mature trees, PLH damage may not be significant, but feeding on young trees stunts shoot growth.

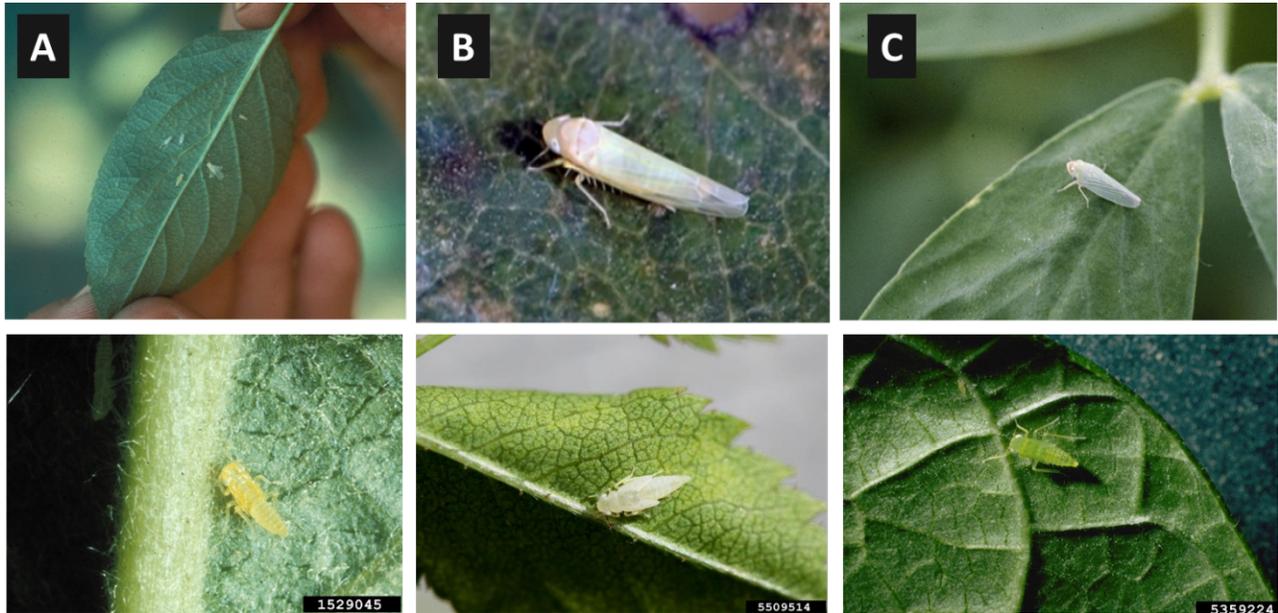
**ID/Life Cycle:**

White apple leafhopper (WALH) and rose leafhopper (RLH) adults are light yellow with the head slightly darker. WALH nymphs walk forward and backward. Nymphs and adults of the potato leafhopper (PLH) are yellowish green to pale green. Young nymphs move very quickly on the underside of leaves. PLH nymphs can walk sideways or backwards, and rapidly move to the underside of the leaf if disturbed.

WALH overwinter as eggs beneath tree bark. Hatching begins just before bloom. Nymphs migrate to leaf underside and feed, advancing into adults by mid-late June. These adults deposit eggs on leaves in July. Nymphs hatch in early August, producing adults in August and September.

RLH overwinter on rose species. First-generation RLH adults migrate into orchards from nearby multiflora rose in early-mid June. Second-generation adults, present in July and August, deposit eggs mostly in orchards. In September, 3rd generation adults can cause extensive excrement spotting of fruit and be a nuisance to pickers before emigrating to rose bushes to deposit overwintering eggs.

PLH overwinter as adults in southern states and move northward mainly through the action of storm fronts. They arrive in New England during June.



**Figure 1)** Leafhopper adults (top row) and nymphs (bottom row): (A) white apple leafhopper (WALH), (B) rose leafhopper (RLH), (C) potato leafhopper (PLH). WALH nymphs are differentiated from PLH nymphs by the way they walk when disturbed - WALH walk forward and backward, while PLH walk sideways in a crab-like fashion. **Photo credit:** University of Georgia Plant Pathology , University of Georgia; Steve L. Brown, University of Georgia; Whitney Cranshaw, Colorado State University; Frank Peairs, Colorado State University; Bugwood.org.

**Damage:** WALH and RLH feed on the underside of leaves producing small, whitish spots on the upper leaf surface. This "stippling" may cover the entire leaves and appear silvery. Feeding can reduce tree vigor, but of more concern is the accumulation of excrement on apple surface.



**Left: White flecking stippling characteristic of WALH and RLH feeding. Right: Feeding damage caused by PLH - leaves curl at the margins, and eventually turn brittle and brown (hopperburn). Photo credit:** Left: Whitney Cranshaw, Colorado State University, Bugwood.org. Right: Ontario Apple IPM.

PLH adults and nymphs feed near the edges of leaves. PLH injects a toxic saliva while feeding, which damages the leaf tissue and causes a characteristic yellowing or chlorosis called hopperburn, followed by cupping of young terminal leaves. If several leaves on a shoot are affected, shoot growth may be greatly stunted. Feeding by the potato leafhopper in the vascular tissue is such that it may spread fire blight

## Management Strategies

### Monitoring:

- To monitor WALH and RLH, check 10 interior fruit cluster leaves per tree on 10 trees per block. Tentative treatment threshold is 3 WALH or RLH nymphs per leaf in June. However, growers who have had troublesome leafhopper populations at harvest may want to use a lower threshold of 25 nymphs per 100 leaves in June.
- For PLH, monitor the population by examining leaf undersides in outer canopy, especially on younger trees. Tentative threshold of one PLH per leaf.

### Cultural/Biological

- There are only a few parasitoids or predators that attack leafhoppers, but none provide biological control.

### Chemical

- Refer to the [New England Tree Fruit Management Guide](#) for specific materials and rates recommended for managing Leaf Hoppers.
- DO NOT APPLY INSECTICIDES DURING BLOOM.
- Rotate insecticides from different IRAC groups to reduce the chance of resistance development in the pest.

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**Author(s):** Jaime Piñero, Elizabeth Garofalo, Sonia Schloemann, UMass Extension

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