

Organic production of tart cherries: Use of copper-fungicides to manage cherry leaf spot disease

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- **What is cherry leaf spot disease?**

Cherry leaf spot disease (CLS) is a foliar disease of tart cherries caused by the fungus *Blumeriella jaapii*. An infected tart cherry leaf will have small brown/purple necrotic lesions, often accompanied by a varying degree of chlorosis (leaf yellowing). On the underside of the leaf, white/cream colored masses of fungal spores are often also present. Left unmanaged, CLS will prematurely defoliate the tree canopy.

- **What are the differences between copper-fungicides & synthetic fungicides?**

1. Synthetic fungicides target biochemical processes specific to the biology of *Blumeriella jaapii*. This narrow spectrum of target specificity increases the chances of fungal resistance to synthetic fungicide chemistries.
2. In contrast, copper-fungicides inhibit protein metabolism in all fungi, not just *Blumeriella jaapii*. Thus, the chance for fungal resistance to these chemistries is expected to be low or non-existent.
3. Synthetic fungicides are often semi-systemic, and are absorbed by the leaf tissue. This is an added front of protection.

- **Are there disadvantages to using copper-fungicides to manage CLS?**

There is some evidence that *excessive* amounts of copper are responsible for disrupting the plant's ability to utilize sunlight for photosynthesis. This *could* compromise the leaf's ability to produce sugars needed for quality, marketable cherry fruit. Often, the use of copper-fungicides on tart cherry trees is accompanied by a severe bronze-colored-discoloration on the underside of the leaf.

- **Does visible leaf discoloration, associated with copper-fungicide use, lead to decreases in plant health?**

Part of our research is geared towards determining if visible copper toxicity is merely cosmetic, or if it is significantly reducing the health of the leaf.

- In 2006, we measured photosynthesis in tart cherry trees ('Montmorency') exposed to: CLS (no fungicides); synthetic fungicides only; synthetic+copper fungicides.
- For "sun-adapted" leaves: Photosynthesis *decreased at the same rate* for both the CLS and the copper-treated leaves over the growing season.
- For "shade-adapted" leaves: No significant decrease in photosynthesis was found in copper-treated leaves over the growing season, compared to CLS-positive leaves.
- Conclusions: Sun-exposed leaves in a copper-fungicide program *may* be more sensitive to copper damage than shade-exposed leaves.