

Bacterial Canker Control for Sweet Cherries

Gary Thornton and Jim Nugent

District Fruit IPM Agent and District Horticultural Agent
Michigan State University

1997

The use of copper on sweet cherries to aid in the control of Bacterial Canker is a controversial subject. Some growers swear that it helps and other growers don't bother applying it, as they see little value in it. My advice would be that if you're happy with the results so far, then continue the practice. Keep in mind though, that the severity of this disease is greatly influenced by the weather in any given year and wide swings in the severity of this disease should be expected.

When using copper to help control Bacterial Canker, full rate applications of copper should be applied during the dormant to early bud swell period. If applications are made during mid to late bud swell, experience has indicated the need to reduce copper rates by 50%. Once buds begin opening to expose the tender, green tissue inside, then copper may cause serious phytotoxicity. We suggest avoiding application of copper after bud burst to sweets due to possible phytotoxicity. However, if copper is applied between bud burst and bloom, follow labeled rates for blossom blight (generally 25-35% of the dormant rate). Again, we need to indicate that significant phytotoxicity may occur when copper is applied to green tissue on sweet cherries.

The Spray Calendar indicates a multiple application program using Tri-Basic Copper Sulfate for Bacterial Canker control on tart cherries. This is not registered in the same way on sweets due to increased phytotoxicity problems on sweets. Note also that the program indicated will cause leaf defoliation even on tart cherries if applied during warm conditions.

Some additional information on Bacterial Canker that you may find useful can be found below:

Bacterial Canker Suppression

By Gary Thornton and Jim Nugent

Michigan State University

2002

Bacterial canker is a serious disease of sweet cherry in the Eastern United States caused by the bacteria *Pseudomonas syringae* pv. *syringae* and *Pseudomonas syringae* pv. *morsprunorum*. Research has shown that copper offers some control of this disease, however, results are inconsistent. This likely occurs because the pathogen can infect trees over a fairly long period of time in spring, and again in fall. It can invade wood, leaves or fruit. Consequently, some growers swear that it helps and others don't bother applying it, as they see that it has little value.

The bacteria overwinter at the margins of cankers, systemically in the vascular system of the tree or in buds. The bacteria multiply rapidly when weather conditions are cool and wet and are spread mostly by rain. They then invade wounds or natural tissue openings such as nectaries of flowers or stomata. Since infections are so weather dependent, the severity of this disease varies greatly from year to year.

When using copper to help control bacterial canker, full rate applications of copper should be applied during the dormant to early bud swell periods only. Some growers claim success with applications made in the fall at 75% leaf drop. Most applications in Michigan are applied in the spring prior to the bud burst stage. Rates are typically cut in half if the applications are made beyond the mid to late swollen bud stage. Once bud burst occurs and the tender, green tissue inside begins to be exposed,

then copper may cause serious phytotoxicity, particularly if warmer temperatures prevail. However, if copper is applied between bud burst and bloom, follow labeled rates for blossom blight (generally 25-35% of the dormant rate). Again, it should be stressed that significant phytotoxicity may occur when copper is applied to green tissue on sweet cherries. Copper applications later in the growing season are not recommended, as the bacteria do not thrive in the warmer weather.

The MSU Fruit Spray Calendar indicates a multiple application program using Tri-Basic Copper Sulfate for Bacterial Canker control on tart cherries. This is not registered in the same way on sweets due to increased phytotoxicity problems on sweets. Note also that the program indicated will cause leaf defoliation even on tart cherries if applied during warm conditions.

Keep in mind that the weather does play an important role in the level of infections that take place and some of those infections can be avoided through the use of sound cultural practices. When training young sweet cherries, use clothes pins to spread the main scaffolds. Steep crotch angles are more susceptible to winter injury and often lead to damaged tissue that can provide the bacteria a means to enter the tree. Pruning is best done prior to the cool, wet periods of the spring, when the trees are still fully dormant and temperatures are still generally below freezing. If you have to prune later, avoid pruning sweet cherry trees when cool, wet weather is in the near forecast. A few days of warm, dry weather can allow those pruning cuts to dry off and reduce their susceptibility to canker, although it won't prevent all infections from occurring.

Sweet cherries on Gisela rootstocks have demonstrated an increased susceptibility to bacterial canker, so are good candidate orchards to receive copper treatment. Also, consider treating orchards with a past history of canker problems.

In the long term, reducing bacterial canker problems should be addressed by doing all of the horticultural practices that keep trees healthy. This pathogen is an opportunist that causes increased problems when trees are stressed. Factors that increase the predisposition of trees to canker infection include such things as low soil pH, exposure to wind, and low (cold) pockets, but any stress factor may lead to increased problems.

Bacterial Canker Management with Cooper

Gary Thornton, George W. Sundin, Jim Nugent

Michigan State University

2003

Due to the unprecedented severity of bacterial canker on sweet cherry throughout Michigan in 2002, the potential exists for increased canker again this year. Keep in mind though, that the severity of this disease is greatly influenced by the weather (especially by the occurrence of frost damage during bloom) in any given year and wide swings in the severity of this disease should be expected. Protection of younger trees is especially important as girdling cankers can lead to significant limb loss and tree death.

Bacterial canker is a serious disease of sweet cherry in the Eastern United States caused by the bacteria *Pseudomonas syringae* pv. *syringae* and *Pseudomonas syringae* pv. *morsprunorum*. The bacteria overwinter at the margins of cankers, systemically in the vascular system of the tree or in buds. The bloom period is the time when the bacteria are most active; rapid multiplication and spreading is facilitated by cool, wet weather and rain. Bacterial infection occurs following the invasion of wounds or natural tissue openings such as nectaries of flowers or stomata. *The level of infection is greatly influenced by the occurrence of frost damage or extended periods of cool, rainy weather.* Since infections are so weather dependent, the severity of this disease varies greatly from year to year.

Copper has been widely proposed as offering some level of control of this disease, however, the use of copper on sweet cherries to aid in the control of bacterial canker is a controversial subject. Some growers swear that it helps and others don't bother applying it, as they see little value in it.

When using copper to help control bacterial canker, full rate applications of copper should be applied during the dormant to early bud swell periods only. Researchers in some regions have shown success with applications made in the fall at 75% leaf drop. Most applications in Michigan are applied in the spring prior to the bud burst stage. Rates are typically cut in half if the applications are made beyond the mid to late swollen bud stage. Once bud burst occurs and they begin to expose the tender, green tissue inside, then copper may cause serious phytotoxicity particularly if warmer temperatures prevail. However, if copper is applied between bud burst and bloom, follow labeled rates for blossom blight (generally 25-35% of the dormant rate). Again, it should be stressed that significant phytotoxicity may occur when copper is applied to green tissue on sweet cherries. *Copper applications later in the growing season are not recommended, as the bacteria do not thrive in the warmer weather.* Sweet cherries on Gisela rootstocks have demonstrated an increased susceptibility to bacterial canker, so are good candidate orchards to receive copper treatment. One and two year old sweet cherry trees that have been partially debudded to aid in proper limb placement should be treated with copper immediately after debudding takes place – if debudded before bud opening. Also, consider treating orchards with a past history of canker problems.

The Spray Calendar indicates a multiple application program using Tri-Basic Copper Sulfate for Bacterial Canker control on tart cherries. This is not registered in the same way on sweets due to increased phytotoxicity problems on sweets. Note also that the program indicated will cause leaf defoliation even on tart cherries if applied during warm conditions.

Keep in mind that the weather does play an important role in the level of infections that take place and some of those infections can be avoided through the use of sound cultural practices. When training young sweet cherries use clothespins to spread the main scaffolds. Steep crotch angles are more susceptible to winter injury and often leads to damaged tissue that can provide the bacteria a means to enter the tree. Pruning is best done prior to the cool, wet periods of the spring, when the trees are still fully dormant and temperatures are still generally below freezing. If you have to prune later, avoid pruning sweet cherry trees when cool, wet weather is in the near forecast. A few days of warm, dry weather can allow those pruning cuts to dry off and reduce their susceptibility to canker, although it won't prevent all infections from occurring.

In the long term, reducing bacterial canker problems should be addressed by doing all of the horticultural practices that keep trees healthy. This pathogen is an opportunist that causes increased problems when trees are stressed. Factors that increase the predisposition of trees to canker infection include such things as low soil pH, exposure to wind, and low (cold) pockets, but any stress factor may lead to increased problems.