

## Angular Leaf Spot of Strawberry

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**What is angular leaf spot?** Angular leaf spot is a severe bacterial disease that can adversely affect strawberries wherever they are grown, potentially causing yield losses of up to 75%. The disease appears to have originated in the U.S and was first described in Minnesota in 1960.



Straight-edged spots on strawberry leaves with oozy masses in the center are typical of angular leaf spot. (Photo courtesy of Patricia McManus)

**What does angular leaf spot look like?** Symptoms of angular leaf spot develop on strawberry leaves and sepals (the green leaf-like parts of the strawberry fruit). Initial symptoms are small, angular (i.e., straight-edged), water-soaked, translucent spots on lower leaf surfaces. White, cream or yellow-colored ooze may appear on the spots when humidity is high. This ooze can eventually dry and become crusty. As the disease progresses, spots enlarge and merge, becoming visible on the upper surfaces of the leaves. Severely affected leaves dry and turn reddish-brown. Parts of the leaves can tear away. Angular leaf spot can also cause sepals to darken, leading to so-called "black caps" that reduce the

quality and salability of fruit.

**Where does angular leaf spot come from?** Angular leaf spot is caused by the bacterium *Xanthomonas fragariae* which is typically introduced into a garden on infected plants. Once present in a garden, the bacterium can be spread by splashing water from rain or watering with a sprinkler. Once established in a garden, *X. fragariae* overwinters on strawberry leaf debris. Weather conditions that favor angular leaf spot are not well understood, although high humidity appears to play a role.

**How do I save a plant with angular leaf spot?** Once a plant is infected, it cannot be cured. If angular leaf spot is detected early, use of copper-containing compounds labeled for use on strawberries may help limit disease development although the effectiveness of such sprays can be quite variable. If you decide to use such a product, be sure to read and follow all label instructions for the product that you select to ensure that you use it in the safest and most effective manner possible. Avoid using copper sprays once flowers have formed.

## **How do I avoid problems with angular leaf spot in the future?**

Unfortunately, strawberry cultivars resistant to angular leaf spot are not available and some cultivars (e.g., 'All Star', 'Annapolis', 'Cavendish', 'Honeoye' and 'Kent') have been observed to develop particularly severe symptoms. When first establishing a strawberry patch, be sure to purchase disease-free plants. When watering, use a drip or soaker hose to reduce splash that can move the *X. fragariae* from plant to plant. Also, **DO NOT** handle strawberry plants or harvest berries when they are wet, as this can promote spread of the pathogen. Prevent additional spread on gardening tools and other gardening items by dipping or treating them for at least 30 seconds with 10% bleach or preferably (because of its less corrosive properties) 70% alcohol. Rubbing alcohol and many spray disinfectants typically contain approximately 70% alcohol and are easy to use. If angular leaf spot occurs in your strawberry patch, remove infected leaves and any infested debris. Dispose of this material by burning (if allowed by local ordinance) or burying it.

**For more information on angular leaf spot of strawberry:** See UW-Extension bulletin A3682 ("Strawberry Disorder: Angular Leaf Spot") available at <http://learningstore.uwex.edu> or contact your county Extension agent.

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