

## Anthracnose on Snap Beans

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Anthracnose is a major disease of the common snap bean (*Phaseolus vulgaris*) and can occur on other legumes. It is caused by the fungus *Colletotrichum lindemuthianum*. When environmental conditions are favorable, crop losses can be as high as 100 percent on susceptible cultivars of snap beans.

### Symptoms

On small seedlings, dark brown to black lesions appear on the embryonic leaves (cotyledons). Seedling stems (hypocotyls) may have rust-colored flecks or 1/4-inch-long elliptical, sunken lesions that weaken the stems, causing stunting, or girdle the stems, causing seedling death.

Leaf lesions typically appear first on lower leaf surfaces near the veins and, as the disease progresses, appear on upper leaf surfaces. The lesions are elongate, angular, and brick red to purple. They turn brown to black with age. Lesions may also form on petioles.

Circular to irregular, sunken lesions on bean pods are the most noticeable symptom of anthracnose (Figure 1). Pod lesions are up to 1/2-inch in diameter and are tan to rust-colored with a brown or purple border. Inside the pod, the seed coat may have brown to black lesions. During severe outbreaks of this disease, pods may dry and fail to fill.



Figure 1. Anthracnose lesions on snap bean and enlarged view of tan to pink spore masses. (Photo by E. Bush)

When environmental conditions favor development of this disease, lesions become filled with tan or pink spore masses of the fungus. Later, when the beans dry, the spore masses are powdery and brown to black.

### Disease Cycle

The anthracnose fungus can be seed-borne, but the fungal inoculum can also survive in infested crop debris. Air currents, water, contaminated garden tools or insects can spread the fungus, as can people or animals moving through the garden.

The fungal spores can germinate and begin the infection process in as little as 6 hours when environmental conditions are favorable. Sporulation and infection can occur at temperatures from 55° to 79°F, but cool temperatures (approximately 63°F) are most conducive to severe outbreaks. Moist conditions favor sporulation and infection. Periods of wet weather, combined with wind that carries spores to new infection sites, can result in serious outbreaks of this disease.

Other commonly grown legumes susceptible to this disease include scarlet runner bean (*Phaseolus coccineus*), cowpea (*Vigna unguiculata*), broad or fava bean (*Vicia faba*), and lima bean (*Phaseolus lunatus*).

### Control

#### Cultural

Remove or bury any plant debris to avoid harboring fungal inoculum that can cause future infections. Plant disease-free seed and do not save seed from legumes diagnosed with anthracnose. Rotate areas of the garden where anthracnose has been identified to crops other than legumes, such as corn or solanaceous crops, for two years. Avoid working in the garden when foliage is wet to prevent transport of fungal inoculum to

new areas. Also, do not apply overhead irrigation which will wet and liberate fungal spore masses on foliage. Dry conditions inhibit infection and sporulation by the anthracnose fungus, so ensure adequate plant spacing which promotes foliar drying. Weed control will help promote proper air circulation and decrease moisture in the foliar canopy. Do not plant seeds before the recommended planting dates, because cool conditions favor development of this disease.

## Resistance

Anthracnose-resistant bean cultivars are available. However, there are a number of races of the anthracnose pathogen and no single cultivar possesses reliable resistance to all races of the pathogen. Therefore, in cases where anthracnose has been identified, gardeners will have to test resistant cultivars to see which one(s) may prove resistant to the race(s) present in their gardens. 'Opera' and 'Florence' are two snap-bean cultivars with resistance to anthracnose.

## Chemical

No fungicides are currently labeled for use by homeowners to control anthracnose on snap beans. Chlorothalonil is labeled for control of anthracnose on lima beans in cases where the dry beans will be harvested and the pods discarded. Refer to the current *Pest Management Guide, Home Grounds and Animals*, Virginia Cooperative Extension publication 456-018, at <http://pubs.ext.vt.edu/456-018/> for details on brand names for chlorothalonil fungicides and fungicide application recommendations.

## Seed Treatment

A hot-water seed treatment has been reported to kill the fungus in infested seed without reducing seed germination. Seeds soak at 64° to 72°F for 15 hours and then soak at 117°F for 25 minutes.

## References

Howard, R.J., Garland, J.A., and Seaman, W.L., (eds.). 1994. *Diseases and Pests of Vegetable Crops in Canada*. Entomological Society of Canada. Ottawa, Ontario K2A1Y8, Canada.

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Sherf, A.F., and Macnab, A.A. (eds.). 1986. *Vegetable Diseases and their Control*, 2nd ed. John Wiley & Sons, Inc. New York, New York.

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Refer to the current Virginia Pest Management Guide for Home Grounds and Animals (VCE Publication 456-018), <http://pubs.ext.vt.edu/456-018/>, for details on the proper use of pesticides.

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