



Cooperative Extension Service

McCracken County
2025 New Holt Road
Paducah, KY 42001
(270) 554-9520
Fax: (270) 554-8283
extension.ca.uky.edu

Mary Hank

Agent for Horticulture



**OCTOBER
2023**

Inside this issue:

- Toolbox Garden Series October 3rd at 5pm "Propagate by Cuttings"
- Commercial Production of Elderberry
- Growing Your Farm and Food Business
- Red Crown Rot of Soybean
- Toolbox Garden Series November 7th Wreath Making Class is Full
- Pumpkin Apple Muffins Recipe - Plate it up!

Master Gardener Spotlight

Brenda Johnson



Class of 1998



**Cooperative
Extension Service**

Agriculture and Natural Resources
Family and Consumer Sciences
4-H Youth Development
Community and Economic Development

MARTIN-GATTON COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT

Educational programs of Kentucky Cooperative Extension serve all people regardless of economic or social status and will not discriminate on the basis of race, color, ethnic origin, national origin, creed, religion, political belief, sex, sexual orientation, gender identity, gender expression, pregnancy, marital status, genetic information, age, veteran status, physical or mental disability or reprisal or retaliation for prior civil rights activity. Reasonable accommodation of disability may be available with prior notice. Program information may be made available in languages other than English. University of Kentucky, Kentucky State University, U.S. Department of Agriculture, and Kentucky Counties, Cooperating. Lexington, KY 40506



Disabilities
accommodated
with prior notification.



PROPAGATION BY
CUTTINGS

MASTER GARDENER

TOOLBOX SERIES

OCTOBER 3RD , 2023

5PM CST



University of Kentucky
College of Agriculture,
Food and Environment
Cooperative Extension Service



Master Gardener President, Bud Qualk, will be educating the public on how to propagate by cuttings. This event is open to the public.

McCracken County
Cooperative Extension Service

2025 New Holt Road
Paducah, Ky 42001
(270)-554-9520

Mary Hank
Agent for Horticulture

Mkha270@uky.edu

Contact the McCracken County
Cooperative Extension Service at
(270)-554-9520 to learn more

If inclement weather closes McCracken
County Schools, programs are canceled

Cooperative Extension Service

Agriculture and Natural Resources
Family and Consumer Sciences
4-H Youth Development
Community and Economic Development

MARTIN-GATTON COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT

Educational programs of Kentucky Cooperative Extension serve all people regardless of economic or social status and will not discriminate on the basis of race, color, ethnic origin, national origin, creed, religion, political belief, sex, sexual orientation, gender identity, gender expression, pregnancy, marital status, genetic information, age, veteran status, physical or mental disability or reprisal or retaliation for prior civil rights activity. Reasonable accommodation of disability may be available with prior notice. Program information may be made available in languages other than English. University of Kentucky, Kentucky State University, U.S. Department of Agriculture, and Kentucky Counties, Cooperating. Lexington, KY 40506



Disabilities
accommodated
with prior notification.

Commercial Production of Elderberry

Matt Ernst¹ and Rachel Painter²

CENTER FOR
PROFITABLE AGRICULTURE
UTEXTENSION
INSTITUTE OF AGRICULTURE
A UNIVERSITY OF TENNESSEE - FARM BUREAU PARTNERSHIP




AGRICULTURE AND NATURAL RESOURCES

Introduction

The American elderberry (*Sambucus nigra* subsp. *canadensis*) is a large shrub or small tree native to Kentucky, Tennessee, and West Virginia. Wild stands are found growing from Florida to Quebec and west to the Rocky Mountains. It is closely related to the European elderberry (*Sambucus nigra*), which exhibits very similar morphological characteristics. Elderberries produce attractive white flowers in cymes followed by large clusters of small fruit. While elderberries are not normally eaten fresh due to their tartness and reported toxic effects, wild and cultivated elderberries can be processed, either alone or with other fruit. Significant elderberry research has been conducted by the Center for Agroforestry at the University of Missouri. Kentucky, Tennessee, and West Virginia producers considering an elderberry enterprise can review research-based publications about elderberry at the Center for Agroforestry website, <http://www.centerforagroforestry.org/>. Research is also being conducted at West Virginia University as part of a [Northeast Sustainable Agriculture Research & Education project](#).

Marketing and Market Outlook

Most commercially grown elderberries are sold to processors for wines, juices, jellies, jams, syrups, and baked goods. Both the fruit and flowers are used in winemaking. Additionally, there is increasing popularity and market demand for elderberries in the health supplement and tonic indus-



Photo by Patrick Byers, University of Missouri.

The best soils for elderberries are loams, sandy loams, or clay loams that are well-drained and moderately acidic.

try. With the lack of processing facilities for elderberries and similar fruits in the southeast, many small-scale elderberry producers market direct to consumers through on-farm stands, you-pick operations, and farmers markets. The majority of elderberry producers are small-scale and focus marketing efforts on educating and creating awareness of the elderberry and common uses to consumers. As consumer awareness and demand continues to increase, and with supply of locally produced elderberries being limited, elderberry producers are often able to capture a premium price and have product sold in advance of harvest. Producers interested in wholesale market channels should arrange for a market contract prior to crop establishment.

 CENTER FOR
CROP
DIVERSIFICATION
www.uky.edu/CCD

¹Matt Ernst is an independent contractor with the University of Kentucky Center for Crop Diversification.

May 2023

²Rachel Painter is an Extension Specialist with the Tennessee Center for Profitable Agriculture.

Reviewed by David Lockwood, Fruit and Nut Crops Extension Specialist, University of Tennessee, and Shawn Wright, Horticulture Specialist, University of Kentucky.

GROWING YOUR FARM AND FOOD BUSINESS WORKSHOPS

Join KCARD staff and partners for a workshop focused on how to grow your agribusiness with topics including business planning, funding, and more!

November 9th Caldwell County	November 14th Clay County	December 5th & 7th Virtual
--	-------------------------------------	--



**Kentucky Center for Agriculture and
Rural Development**





Red Crown Rot of Soybean

Carl A. Bradley

*Plant Pathology
Extension Specialist*

Kelsey Mehl

*Plant Pathology
Extension Associate*

INTRODUCTION

Red crown rot is a soybean disease that was first confirmed in Kentucky in 2021 and first confirmed in the neighboring state of Illinois in 2018. Historically, red crown rot had been considered a disease that occurred in states further south than Kentucky (i.e., Louisiana and Mississippi). From measurements conducted within a few Kentucky soybean fields in 2021, small areas affected by red crown rot had grain yields that were approximately 70% less than non-symptomatic areas of these fields. Although the current distribution of red crown rot in Kentucky appears to be limited, the disease has the potential to cause major yield losses.

SYMPTOMS & SIGNS

Symptoms of red crown rot can occur on leaves, lower stems, and roots of soybean plants.

On **leaves**, symptoms first appear as chlorotic (yellow) flecks that occur between veins (FIGURE 1). These chlorotic flecks may continue to develop into interveinal chlorosis (yellowing between the leaf veins, while veins remain green) and interveinal necrosis (dead areas between the leaf veins, while veins remain green) (FIGURE 2). Leaf symptoms are caused by a phytotoxin produced by the causal fungus, which moves through the plant and accumulates in leaves. These leaf symptoms generally are not observed until soybean plants reach the reproductive stages of development (beginning flowering and beyond).



FIGURE 1. YELLOW (CHLOROTIC) FLECKS OCCURRING ON SOYBEAN LEAFLETS BETWEEN THE MAIN VEINS, CAUSED BY RED CROWN ROT.



FIGURE 2. INTERVEINAL CHLOROSIS (YELLOWING BETWEEN THE VEINS) AND NECROSIS (DEAD TISSUE BETWEEN THE VEINS) ON SOYBEAN LEAFLETS, CAUSED BY RED CROWN ROT.

Lower stem and root symptoms may be observed prior to leaf symptoms. Infections result in a reddish discoloration of lower stems (areas just above the soil line) and roots (FIGURE 3). During the late soybean development stages (pod and seed development and later), white fungal growth (mycelia) may develop on roots and lower stems, and fungal fruiting structures (perithecia) also may develop (FIGURE 3). Perithecia are red to reddish-orange, spherical, and less than 1/16 inch in diameter (FIGURES 3 & 4).



FIGURE 3. RED DISCOLORATION OF LOWER SOYBEAN STEM AND ROOTS CAUSED BY RED CROWN ROT, AND WHITE MYCELIA (WHITE FUNGAL GROWTH) AND RED, SPHERICAL FRUITING BODIES (PERITHECIA) PRODUCED BY THE RED CROWN ROT FUNGUS.

FIGURE 4. REDDISH-ORANGE SPHERICAL FRUITING BODIES (PERITHECIA) ON A SOYBEAN ROOT, PRODUCED BY THE RED CROWN ROT FUNGUS.

FIGURE 5. A PATCH OF PREMATURELY DEAD SOYBEAN PLANTS SEVERELY AFFECTED BY RED CROWN ROT.

Areas of symptomatic plants in fields generally occur non-uniformly within patches. Soybean plants that are severely affected by red crown rot may die prematurely, while non-affected plants remain green (FIGURE 5).



CAUSE & DISEASE DEVELOPMENT

Red crown rot is caused by the fungus *Colonectria illicicola*. This fungus overwinters and survives in the soil as specialized structures known as microsclerotia. The fungus may begin to infect soybean roots shortly after planting. The greatest infection of roots occurs when soil temperatures are between 77°F and 86°F. The fungus has a broad host range, which includes alfalfa and peanut as other agriculturally important hosts.

DISEASES WITH SIMILAR SYMPTOMS

Red crown rot can be confused with other soybean diseases, which can make diagnosis difficult. The most accurate diagnosis requires a laboratory analysis, and symptomatic soybean samples from Kentucky fields can be submitted to the University of Kentucky Plant Disease Diagnostic Laboratory through your local Kentucky county Extension office.

Potential look-alike diseases that have symptoms of interveinal chlorosis/necrosis on soybean leaves include **sudden death syndrome (SDS)**, **southern stem canker**, and **brown stem rot**. Of these three diseases, only SDS and southern stem canker are currently known to occur in Kentucky, while brown stem rot occurs further north than Kentucky. Although these diseases have similar leaf symptoms to red crown rot, red crown rot generally can be distinguished by the reddish discoloration of lower stems and roots. Observance of the red, spherical perithecia on lower stems and roots is also distinctive to plants affected by red crown rot.

Lower stem and root symptoms caused by **Rhizoctonia root rot** also can potentially be confused with symptoms caused by red crown rot. *Rhizoctonia* root rot may cause reddish-brown lesions on roots and hypocotyls (FIGURE 6); however, these lesions tend to be sunken and girdling, whereas the red discoloration caused by red crown rot generally is not. In addition, *Rhizoctonia* root rot is more likely to first be observed when plants are in the seedling to early-vegetative stages, and red crown symptoms may appear later in the season. Also, perithecia will only be present on lower stems and roots of plants affected by red crown rot.



FIGURE 6. REDDISH-BROWN SUNKEN AND GIRDLING LESIONS ON SOYBEAN HYPOCOTYLS AND ROOTS DUE TO RHIZOCTONIA ROOT ROT.

DISEASE MANAGEMENT

- Rotating to a non-host crop for 2 or more years may help reduce inoculum levels of the red crown rot fungus in the soil.
- Treating soybean seeds with a fungicide seed treatment that includes red crown rot on the label may help protect against early infections by the red crown rot fungus.
- Planting soybeans when soil temperature is less than 77°F may help reduce infections by the red crown rot fungus.
- Management of soybean cyst nematode (SCN) may help reduce potential interactions between SCN and the red crown rot fungus, which have been shown to have an antagonistic effect on soybean plants when both are present.
- Currently, no commercial soybean varieties are marketed with resistance to red crown rot.
- Additionally, no foliar fungicides include red crown rot on their labels, and fungicides will not be effective in managing red crown rot if applied.

ADDITIONAL RESOURCES

- An Overview of Soybean Seedling Diseases (CPN-1008)
<https://cropprotectionnetwork.org/publications/an-overview-of-soybean-seedling-diseases>
- An Overview of Stem Canker (CPN-1006)
<https://cropprotectionnetwork.org/publications/an-overview-of-stem-canker>
- An Overview of Sudden Death Syndrome (CPN-1011)
<https://cropprotectionnetwork.org/publications/an-overview-of-sudden-death-syndrome>

September 2023

Acknowledgement

The authors are grateful to Nicole Gauthier, Plant Pathology Extension Specialist, University of Kentucky, for reviewing this publication.

Editor: Cheryl Kaiser, Plant Pathology Extension Support

Photos: University of Kentucky—Carl Bradley (1, 2, 3, 5,6) and Kelsey Mehl (4)

Toolbox Garden Series

November 7th at 5pm

Wreath Making class is full

Call (270) 554-9520 to add your name to the wait list



Pumpkin Apple Muffins

1 ¼ cups all-purpose flour	½ teaspoon ground ginger	1 ½ cups fresh pureed pumpkin
1 ¼ cups whole-wheat flour	½ teaspoon ground nutmeg	½ cup canola oil
1 ¼ teaspoons baking soda	1 ¼ cups honey	2 cups Granny Smith apples, finely chopped
½ teaspoon salt	2 large eggs	
1 ½ teaspoons ground cinnamon		

Preheat oven to 325 degrees F. In a large bowl, **combine** flours, baking soda, salt and spices. In a small bowl, **combine** honey, eggs, pumpkin and oil; **stir** into dry ingredients just until moistened. **Fold** in apples. **Fill** greased or paper lined muffin cups, two-thirds full. **Bake** for 25 to 30 minutes or until muffins test done. **Cool** for 10 minutes before removing from pan.

Note: Can substitute two cups granulated sugar for honey, decrease baking soda by ¼ teaspoon and increase oven temperature to 350 degrees F.

Yield: 18 muffins

Nutritional Analysis: 200 calories, 7 g fat, 0.5 g saturated fat, 35 mg cholesterol, 160 mg sodium, 35 g carbohydrate, 2 g fiber, 20 g sugar, 3 g protein



Buying Kentucky Proud is easy. Look for the label at your grocery store, farmers' market, or roadside stand.

The Martin-Gatton College of Agriculture, Food and Environment is an Equal Opportunity Organization with respect to education and employment and authorization to provide research, education information and other services only to individuals and institutions that function without regard to economic or social status and will not discriminate on the basis of race, color, ethnic origin, national origin, creed, religion, political belief, sex, sexual orientation, gender identity, gender expression, pregnancy, marital status, genetic information, age, veteran status, physical or mental disability or reprisal or retaliation for prior civil rights activity. Reasonable accommodation of disability may be available with prior notice. Program information may be made available in languages other than English. Inquiries regarding compliance with Title VI and Title VII of the Civil Rights Act of 1964, Title IX of the Educational Amendments, Section 504 of the Rehabilitation Act and other related matter should be directed to Equal Opportunity Office, Martin-Gatton College of Agriculture, Food and Environment, University of Kentucky, Room S-105, Agriculture Science Building, North Lexington, Kentucky 40546, the UK Office of Institutional Equity and Equal Opportunity, 13 Main Building, University of Kentucky, Lexington, KY 40506-0032 or US Department of Agriculture, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue, SW, Washington, D.C. 20250-9410.