College of Agriculture, Food and Environment
Cooperative Extension Service

Plant Pathology Fact Sheet **PPFS-OR-W-27**

Canker Sampling of Trees & Woody Ornamentals

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Introduction

Cankers on woody plants can result in dieback, decline, structural failure, or plant death. Cankers form when plant pathogens enter woody tissues. Plants stressed by poor planting practices, improper maintenance, extreme weather, insect damage, mechanical damage, or other wounds are at increased risk for infection by canker causing pathogens.

Cankers appear as dead or dying regions on bark, twigs, branches, or trunks. They may be characterized by cracked, sunken, swollen, or discolored plant tissue (Figure 1), while some cankers may be inconspicuous and appear as flattened areas (Figure 1A). When cankers form, the cambium tissue is damaged or killed, resulting in obstruction of uptake of nutrients and water. Cankers may be small during the first year of infection, but if not removed, can expand.

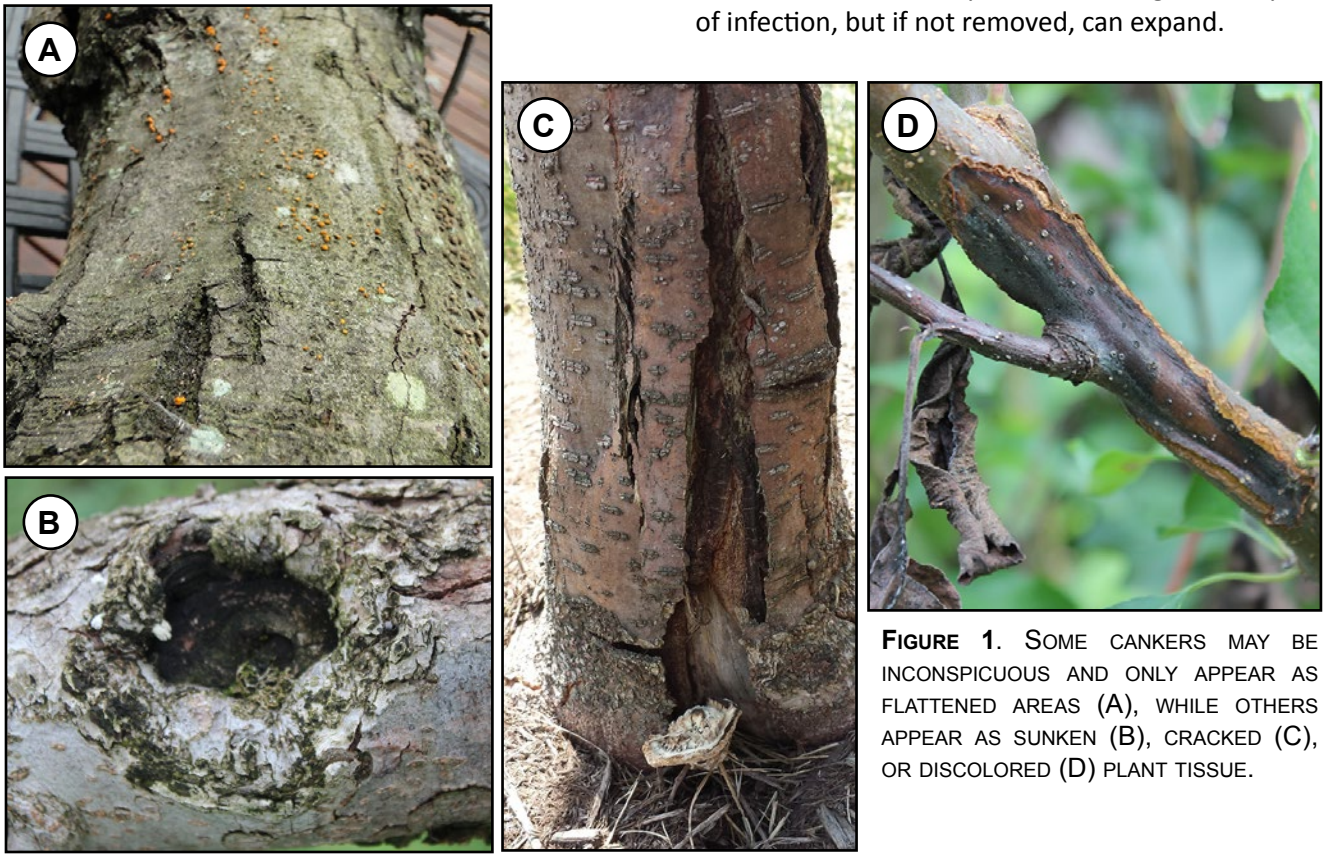

Figure 1. Some cankers may be inconspicuous and only appear as flattened areas (A), while others appear as sunken (B), cracked (C), or discolored (D) plant tissue.

Canker Sampling

Often, it is difficult to obtain woody plant samples for diagnosis due to plant size or canker location. However, obtaining the right type of sample is critical for proper diagnosis. Samples should be submitted to a local county Extension office. County Extension agents may be able to make the diagnosis or will facilitate sample submission to a University of Kentucky Plant Disease Diagnostic Laboratory.

The following details some methods for obtaining appropriate samples. These samples should be labeled carefully and wrapped in paper or stored in a paper bag. Never use sealed plastic bags for storage or shipping. Plant tissue should be refrigerated or kept cool until submission to the diagnostic lab. For best results, samples should be submitted within 1 week of collection.

Sampling Twig Cankers

Twig cankers and blights can easily be removed with sharp pruners. It is important to make the cut several inches below (toward the main trunk) symptomatic wood. Samples should include healthy, diseased, and dead tissue (Figure 2). Avoid samples that consist solely of dead tissue. It is important to clean all tools before and after making cuts, especially if a bacterial pathogen is suspected. Twigs may be cut into two or three pieces for easier handling or shipping.

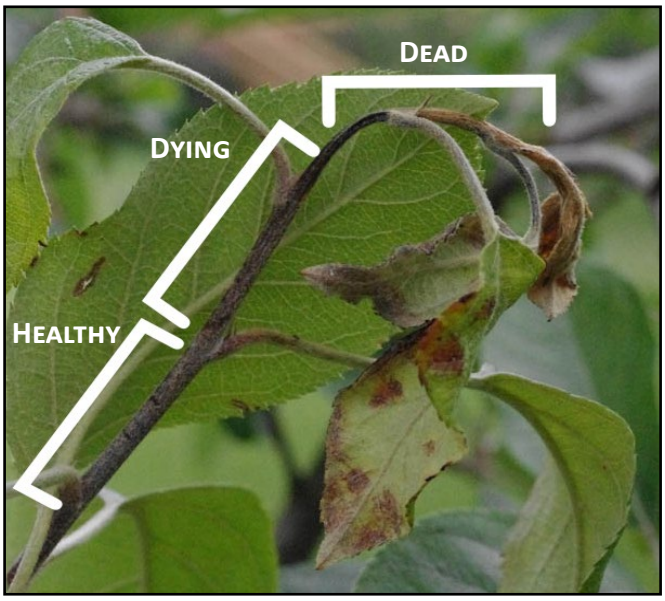

Figure 2. Twig canker samples should include affected and healthy plant tissue. Samples can be removed using a pair of pruners.

Sampling Branch Cankers

Figure 3. The margin of the canker is characterized by a transition from dark symptomatic wood to healthy green wood and is required for plant disease diagnosis.

For all types of cankers, samples should include the margin of the canker, where dark symptomatic wood transitions to healthy green wood (Figure 3).

Sampling Branch Cankers (cont'd)

Branch cankers can often be extracted by first removing the branch with hand pruners or pole pruner. Larger diameter branches may have to be removed using a hand saw, pole saw, or chain saw. Exercise care to make sure that cuts are clean and do not create additional damage to the plant. Make the cut 8 to 12 inches below symptomatic tissue (toward the main trunk) or at the nearest branch union. All tools should be cleaned before and after making cuts. Samples should include gradient zone between affected and healthy plant tissue. Samples can be cut into smaller sections and numbered for easier packaging. (Figure 4). Note that not all cankers are obvious; some cankers may be indistinct. Look for sunken or darkened areas. It may be helpful to remove bark from one side of the canker to locate the margins prior to sampling, but bark should remain on the sample whenever possible.

Figure 4. The process for obtaining a branch canker sample with a hand saw:
(A) Identify the area to cut.
(B) Use a hand saw to make the cut.
(C) The sample can be cut into smaller pieces for submission.

Sampling Trunk Cankers

Sampling from trunk cankers or cankers on large branches involves removing a portion of the canker as opposed to removing the trunk or branch. It is important to obtain a sample from the cambium tissue and should include the canker margin (transition zone from symptomatic to healthy wood) Refer to Figure 2.

Multiple tools and methods can be used to obtain an appropriate sample, including pocket knife, pruner blade, chisel, and hole saw. The following are examples of how to collect a canker sample from the trunk or a large branch. Note that not all cankers are obvious; some cankers may be indistinct. Look for sunken or darkened areas.

Pocket Knife/Hand Saw/Open Pruners Procedure

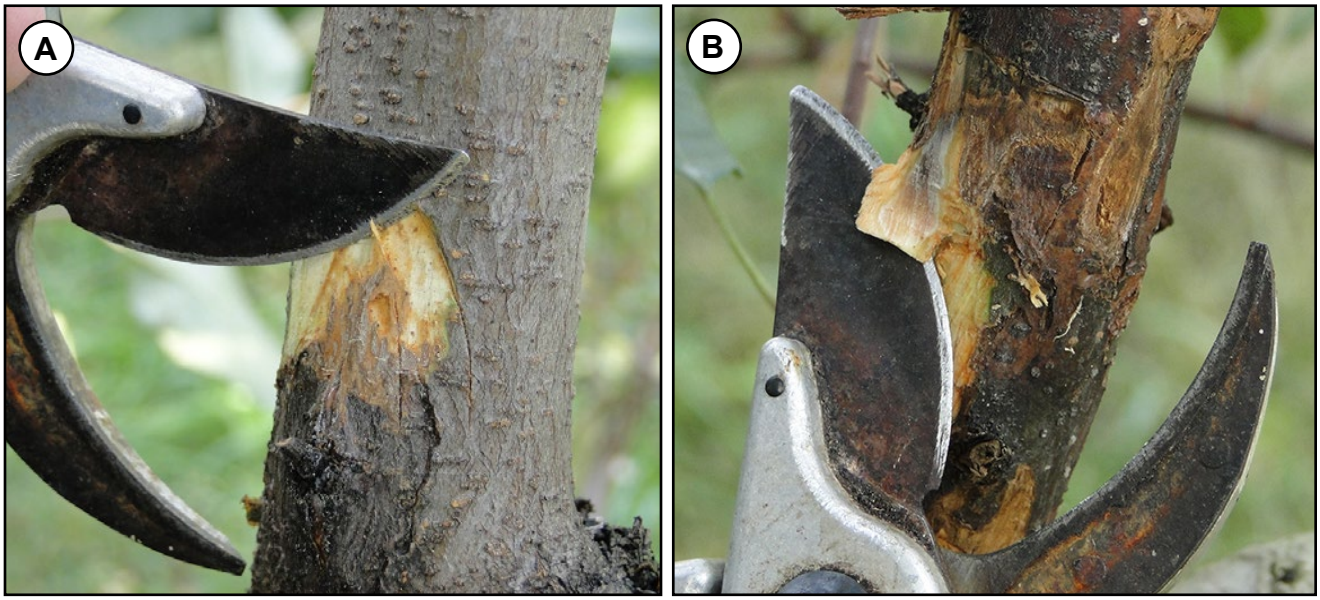

Figure 5. Open pruner method for sampling from softwood plant material:
(A) Peal bark from cankered area and identify the area for sampling.
(B) Cut 1- to 2-inch cambium pieces with a knife, hand saw, or with the sharp side of open pruners.

Chisel Procedure

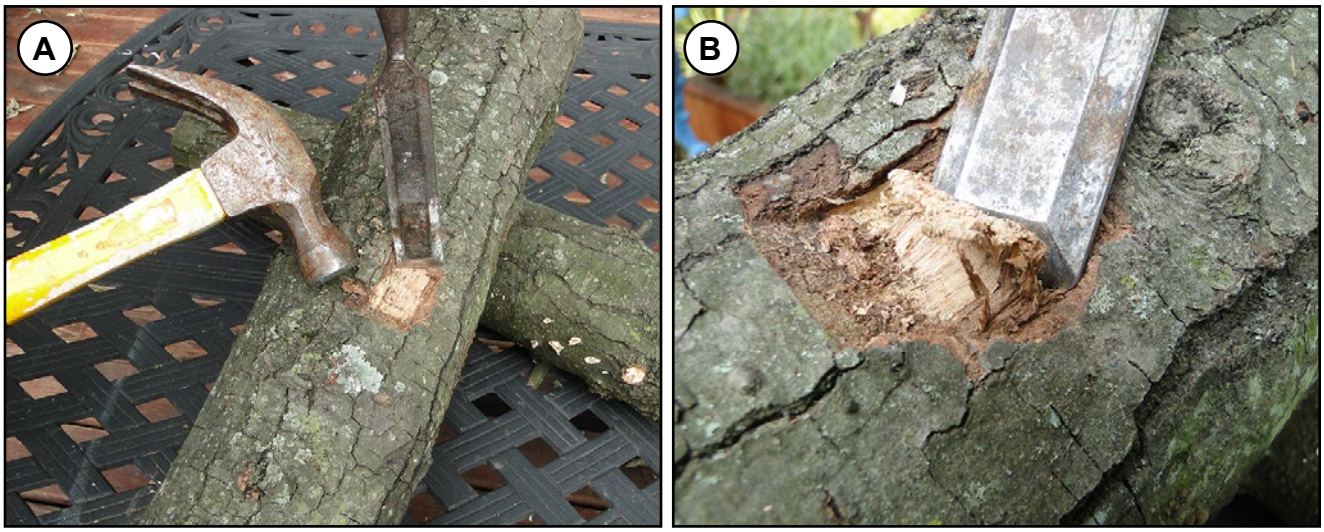

Figure 6. Chisel method for sampling from hardwood plant material:
(A) Use a chisel and hammer to make shallow cuts around the cankered area.
(B) Continue to use a chisel and hammer to extract one or more samples from the cambium.

Sampling Trunk Cankers (cont'd)

Hole Saw Procedure

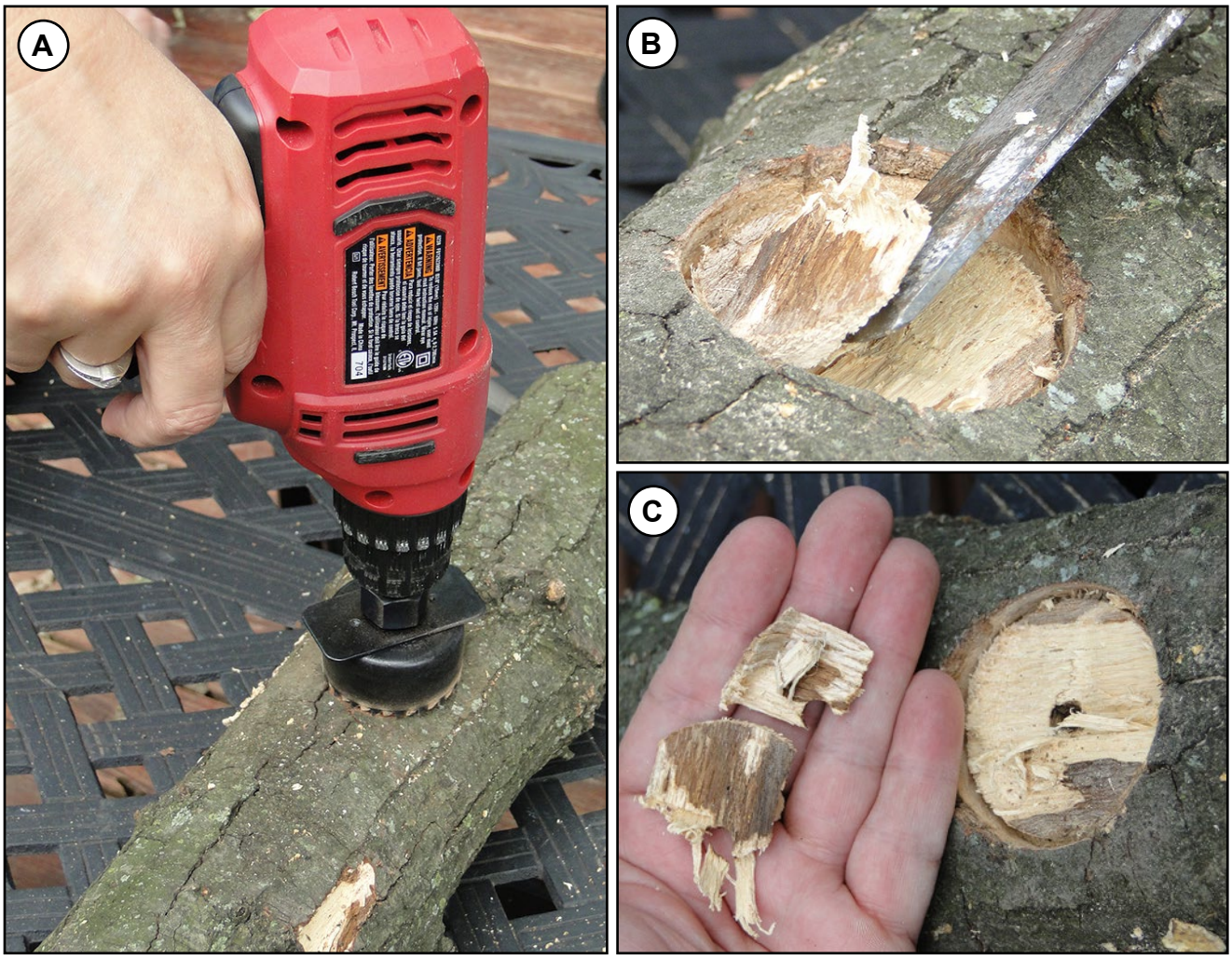

Figure 7. Hole saw method for sampling from hardwood plant material:
(A) Identify an area that includes canker margin and place the hole saw against this area; slowly begin to drill.
(B) Extract shallow pieces that include inner bark (phloem) and cambium layer, about 1/16 to 1/8 inch deep.
(C) Use a knife or screwdriver to remove samples.

Additional Resources

- Tree Wounds – Invitations to Wood Decay Fungi (PPFS-OR-W-01)
https://plantpathology.ca.uky.edu/files/ppfs-or-w-01.pdf

- University of Kentucky Department of Plant Pathology Extension Publications
http://plantpathology.ca.uky.edu/extension/publications

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