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An aid to identifying aspen diseases frequently encountered in the Southwest

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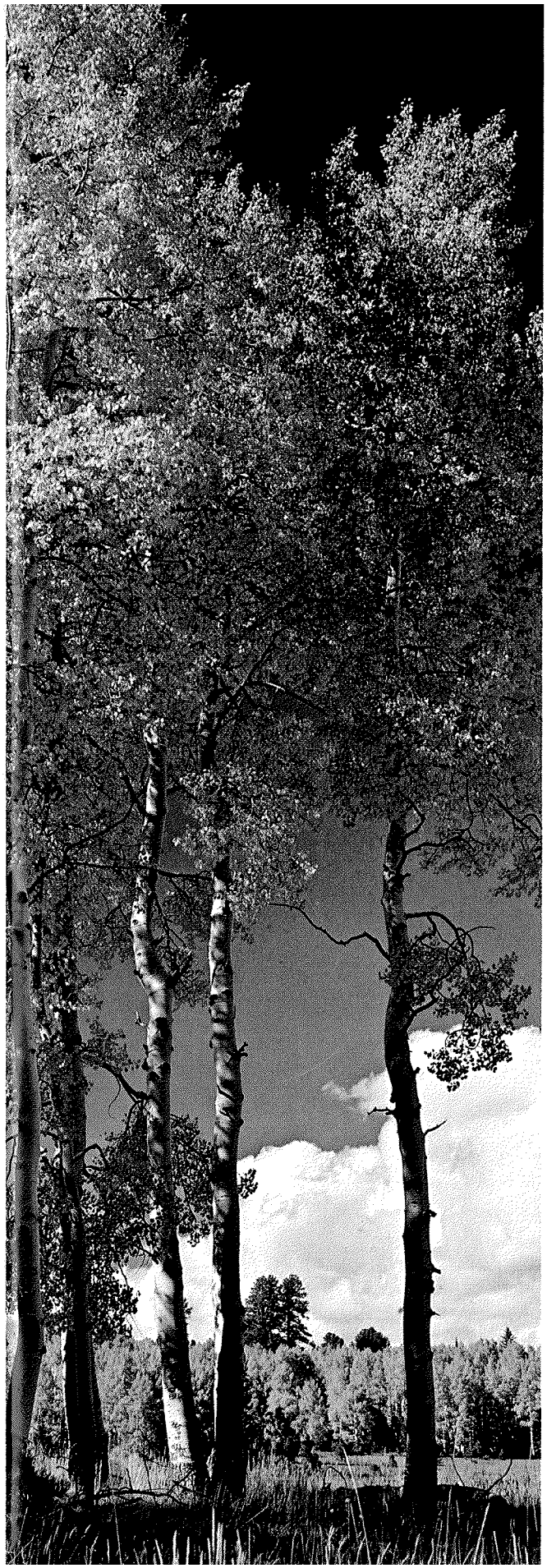

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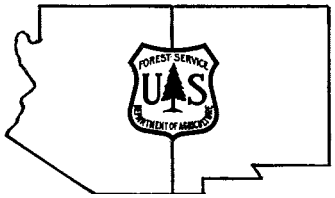

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AN AID TO IDENTIFYING ASPEN DISEASES FREQUENTLY ENCOUNTERED IN THE SOUTHWEST

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TABLE OF CONTENTS

INTRODUCTION

Increased requirements for timber products in the United States has resulted in development of previously unutilized tree species. This trend is expected to continue in future years. During the past several years, land managers have begun to harvest aspen stands in the southern Rocky Mountains. A major problem in harvesting aspen has been the high incidence of defect or cull caused by various aspen diseases. Evaluation of defect and cull losses in aspen stands has been difficult because land managers are unfamiliar with aspen diseases.

The purpose of this report is to familiarize the timber marker with some of the frequently encountered aspen diseases. Comments relative to amount of defect and mortality caused by these diseases are included whenever possible. Identification of diseases occurring in an aspen stand will aid the land manager in estimating the amount of defect or cull before harvesting operations are initiated.

I. STEM DECAYS

A. *Fomes igniarius* var. *populinus* is probably the most common cause of defect and cull in the aspen type of the Southwest. Fruiting bodies or conks of this fungus frequently are found on stems of living and dead trees. Conks are hoof-shaped with the upper surface being gray to black and divided into irregular squares by numerous cracks. The lower surface of the conk is medium brown and has many tiny pores. All infected trees do not bear conks, but most trees with advanced decay do have fruiting bodies. Trees bearing one to three conks at any height or any number of conks below 16 feet averaged 59 percent cull in a study of aspen in Colorado. Trees with more than three conks above 16 feet were complete losses.[1] This decay is most common in overmature stands; however, it may also infect young trees.

B. *Cryptochaete polygonia* is probably as common as *Fomes igniarius;* however, the fungus does not form conks readily and must be isolated for identification. Since external symptoms are seldom produced by this disease, defect or cull caused by it cannot be practically evaluated by the land manager. Rot caused by this organism is usually white with a reddish-brown margin. The decayed wood appears more brittle than non-infected wood. Further studies are necessary to provide more information about the effects of this rot on the tree.

1 Ohman, J.H., and K.J. Kessler, Jr. 1964. White trunk rot of hardwoods. U.S. Dep. Agr., Forest Pest Leaflet 88. 7 p.

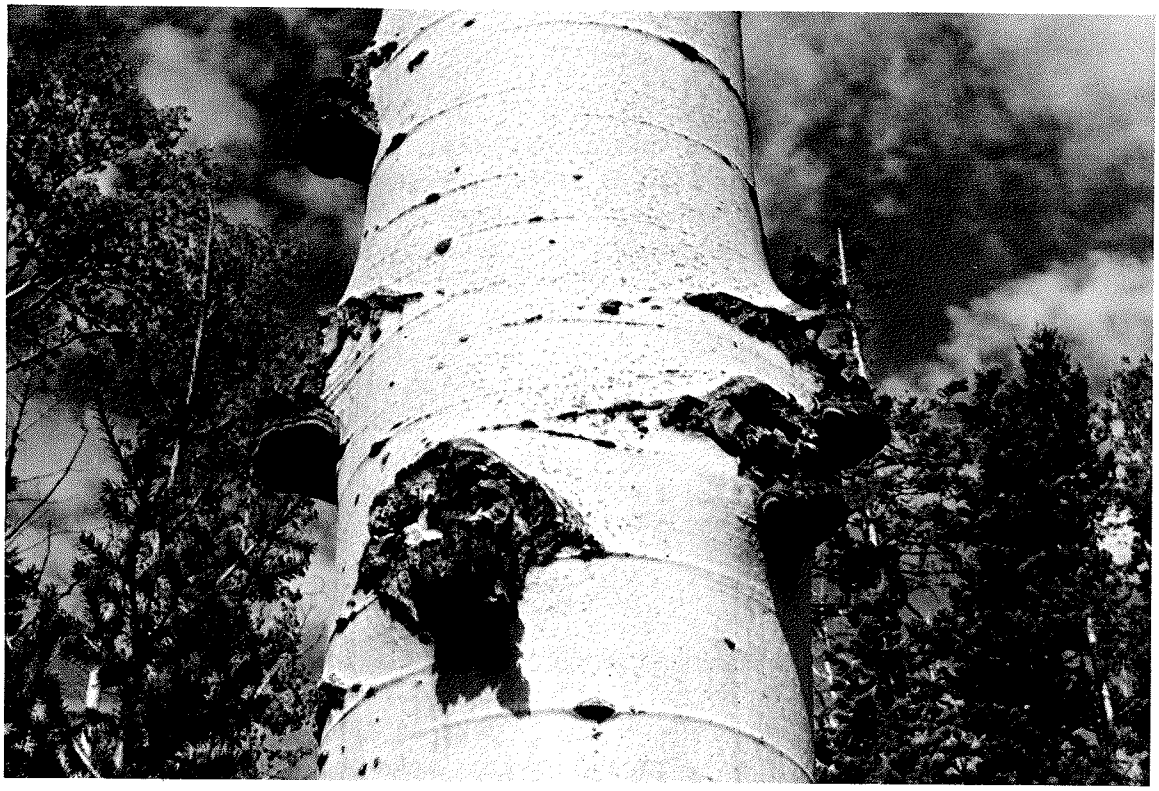

Fig. 1. —*Fomes igniarius* conks.

II. BUTT AND ROOT ROTS

A. *Fomes applanatus* is quite common and frequently predisposes infected trees to blowdown. In general, the merchantability of infected trees is not affected, since this rot seldom extends above 4 feet in the trunk. Removal of infected trees is recommended to avoid losses from windthrow. Mortality from this disease is minimal in most stands. The rot is white mottled and generally restricted to the butt and larger roots of the tree. Conks are often formed at the root collar of infected living trees. They may be very large and are shelf-like. The conk is smooth, light gray to light brown, and crusty on the upper surface. The lower surface of the conk is white, while the interior is dark reddish-brown.

Fig. 2. —*Fomes applanatus* on a living aspen tree.

Fig. 3. —*Fomes applanatus* on aspen blowdown.

B. *Armillaria mellea* is moderately common in aspen stands. Symptoms include white mycelial fans on the roots and root collar. The most diagnostic symptom of Armillaria root rot is the production of black zone lines in decayed wood. Also, honey-colored mushrooms may appear in late summer or early fall at the base of the tree or on stumps. Mortality may occur in patches; however, large numbers of trees are seldom killed. This disease occurs in the lower 2 to 3 feet of the tree; thus merchantability is not adversely affected.

Fig. 4. —*Armillaria mellea* rot with zone lines (see arrow).

Fig. 5. — White mycelia between zone lines produced by *A. mellea* (see arrow).

III. CANKERS

A. *Ceratocystis fimbriata* produces the target-shaped canker frequently encountered on aspen trees. The canker is often associated with wounds on the trunk. Many Ceratocystis cankers are not associated with decay; thus, all trees having a canker should not be considered cull trees. Tree mortality is seldom caused by this canker, since it spreads only a short distance on the tree each year. In some instances, the canker may eventually kill the tree by girdling the stem. Prevention of wounds on trees will reduce the incidence of this disease.

Fig. 6. — Target-shaped canker of *Ceratocystis fimbriata;* note annual growth rings of the canker.

B. *Cenangium singulare,* the sooty-bark canker, is aptly named in that a black residue is formed under the infected bark. This canker is more aggressive than *Ceratocystis* and may cause tree mortality within 4 to 5 years after the initial infection. This disease also occurs in association with wounding to the cambium of the tree. Trunk rots are infrequently associated with this canker; thus, many infected trees will yield an acceptable quantity of sound wood. Due to the aggressive nature of this canker-causing organism, felling all infected trees is recommended as a method of preventing rapid stand deterioration.

Fig. 7. — *Cenangium singulare* canker on aspen.

Fig. 8. — Sooty inner-bark of Cenangium canker.

C. *Hypoxylon mammatum* is moderately common in the aspen stands of the Southwest. At an infection site, the smooth outer bark is sloughed off, revealing a checked cortex. The canker is identified most easily by the laminated, mottled, black and yellowish-white cortex exposed by cutting along the canker margin. Older cankers may be several feet long. White mycelial fans may be present under the bark. Mortality by girdling may occur within 5 years after the initial infection. The merchantability of many infected trees will not be reduced, as decays often are not associated with this canker. All infected trees should be felled in order to minimize spread of the organism.

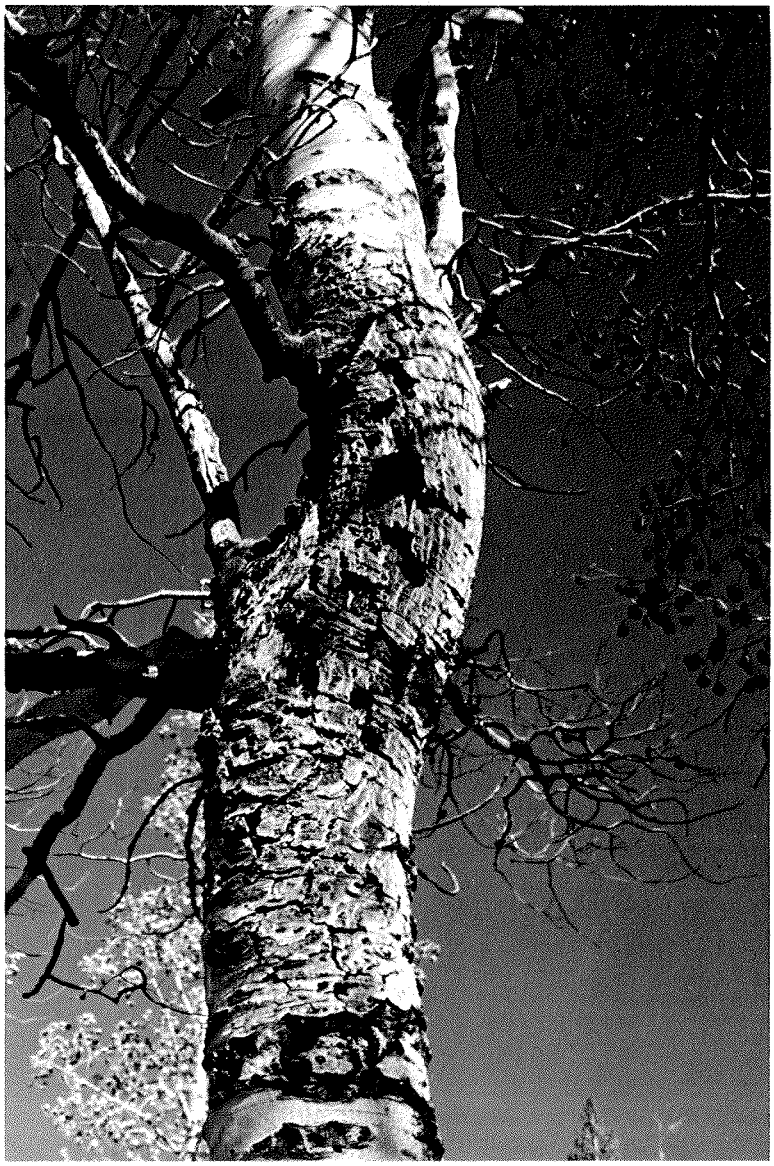

Fig. 9. — Relatively young Hypoxylon canker with bark still intact.

Fig. 10. — Checked cortex caused by Hypoxylon infection.

D. The canker caused by *Cytospora chrysosperma* is widespread on aspen branches and stems. Infected branches or stems are covered with tiny pimple-like spore bodies. Wood beneath the canker is often stained. Little, if any, mortality is associated with this disease. Dying or stressed trees are frequently infected by this organism. Cankers also may be found in association with wounds or natural openings in the bark. Little importance should be attached to this disease in the natural forest stand.

Fig. 11. — Pimple-like spore bodies of *Cytospora chrysosperma.*

IV. FOLIAGE DISEASES

A. *Ciborinia confundens* causing "ink spot" on aspen leaves occurs intermittently throughout the aspen type. Damage by this disease varies from none to extensive defoliation. At several year intervals, the disease can reach localized epidemic proportions in aspen stands. Symptoms of the disease are easily recognized by examination of foliage from an infected tree. Leaves have circular black spots of sclerotia appearing on them in early summer. The spots fall out either while the leaves are still on the tree or after the leaves have fallen. Frequently, premature defoliation of all or a major proportion of the leaves occurs. Little mortality is associated with this disease unless extensive defoliation occurs several years consecutively. Merchantability is not affected by this disease.

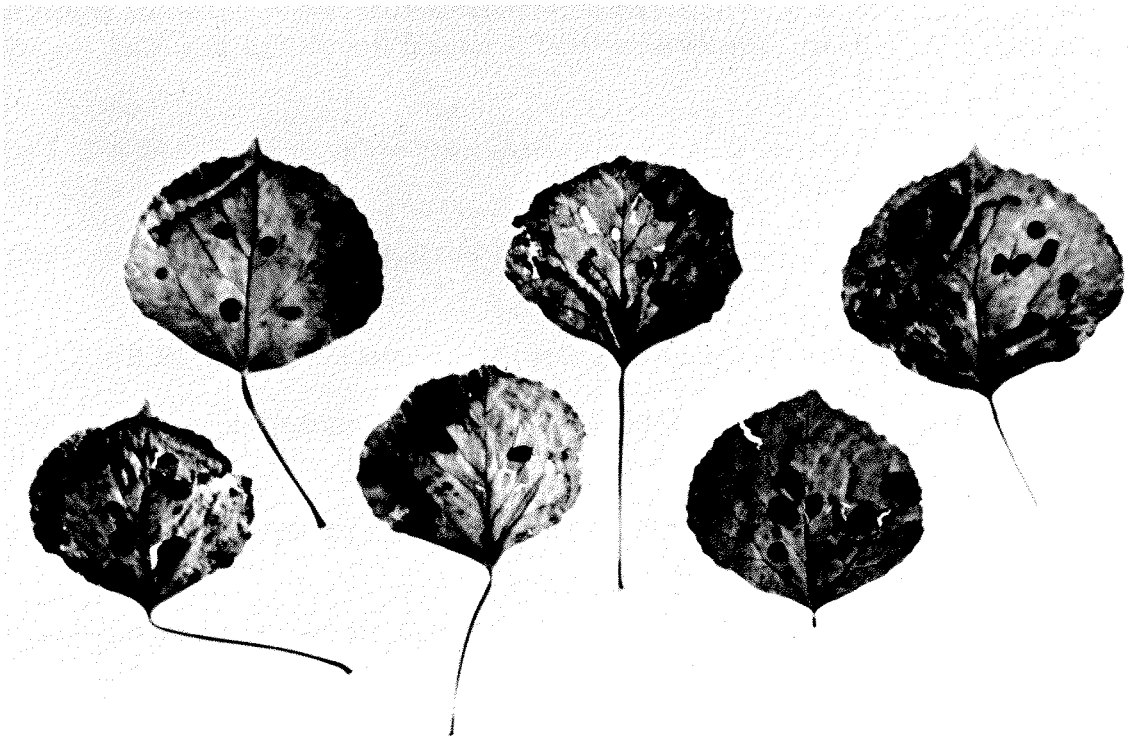

Fig. 12. — Ink spot on aspen leaves.

B. *Marssonina populi* causes leaf spot on aspen. This foliage disease is similar to ink spot in its erratic occurrence from year to year. Generally, in August, the fungus produces small, circular, tan leaf spots which later turn black. Borders of the lesions are yellow or gold. Often, premature defoliation will occur on all or a portion of the tree. Infected leaves often are reduced in size and affected trees may appear bronzed from a distance. With the exception of several consecutive years of defoliation, little mortality is associated with leaf spot on aspen. This disease does not affect merchantability of infected trees.

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