

# FOREST RESEARCH NOTES

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## HEART ROT OF VIRGINIA PINE IN MARYLAND

Loggers and sawmill men have been wary of purchasing Virginia pine sawtimber. They point out that a heart rot, locally called "red heart," may spell the difference between profit and loss on a logging job. It is difficult to detect this rot in standing Virginia pine. It is even harder to estimate the volume loss. And total losses can be determined only after logging and milling.

On the Beltsville Experimental Forest, harvest cuttings were conducted in Virginia pine stands ranging from 40 to about 75 years old. From observations made during the logging job, it appeared that heart rot might indeed be serious, particularly in the older stands. It was noted that the occasional tree bearing a fruiting body of the causal fungus Fomes pini was often unmerchantable. But other trees without this indicator were also found to contain rot, sometimes extensively.

In view of these observations, which seemed to support the opinions of local loggers, a study was made of trees, logs, and lumber from Experimental Forest cuttings. The objectives of this study were to determine: (1) the relationship between indications of rot and the volume of unmerchantable wood; (2) the entry points of the rot; and (3) the actual merchantable volume loss in a given sawlog sample.

The results of this study are discussed as answers to questions most commonly asked. The findings are based on an examination of 168 Virginia pine trees and the sawing of 382 logs cut from these trees.

### 1. How Can One Tell Whether Virginia Pine Trees Contain Heart Rot Infection?

One exterior indication that trees contain heart rot is the presence of old or new sporophores--"elephant ears"--

anywhere along the trunk. These are usually easy to see and are strong indications of advanced decay. In this study, every tree bearing one or more sporophores yielded cull lumber.

Sawlog-size stands, with most trees ranging between 12 and 18 inches d.b.h., will generally have some trees with heart rot.

The age of a stand may be a better indication of rot than size of tree. Of the 168 trees sampled, 9 percent contained advanced decay; their average age was 76 years. Twenty-two percent contained incipient decay; their age averaged 73 years. The remaining 69 percent with no decay averaged 67 years old. A 50-year-old stand cut for pulpwood showed no heart rot.

There did not seem to be any definite correlation of heart rot with other abnormalities such as old and new pitch flows from branch stubs, excessive limbiness, fire scars, wounds, general low vigor of the tree, and Cronartium cerebrum galls.

2. How Much Loss From Heart Rot Can Be Expected In A Mature Virginia Pine Stand?

In the study, about 2 percent of the 18,752 board feet of lumber produced was rejected because of rot. This is probably the minimum loss that would be experienced from similar stands.

Nearly 15 percent of the lumber volume, however, showed varying amounts of incipient decay, characterized by red staining of the heartwood. Lumber thus affected is suitable for most purposes; so this is not an important factor in pine utilization.

But more serious is the fact that, in the tree, the incipient stage can develop into advanced decay rather rapidly. Only a few years' additional growth of a mature Virginia pine stand may therefore result in a marked increase in loss from heart rot.

3. What Can Be Done To Lessen The Amount Of Heart Rot Infection?

It is believed that most infections become established through old branch stubs that provide direct access to the heartwood. Virginia pine is very limby; the dead branches often persist through maturity without being overgrown. As a preventive measure to minimize this means of

heartrot entry, progressive pruning of at least the first log length of selected crop trees is suggested. It is unlikely that trees become infected through superficial injuries or wounds that do not expose heartwood.

4. What Portion Of The Tree  
Is Most Subject To Infection?

As a rule, infection is found in the lower part of a tree. This portion is most likely to have rotten branch stubs, which may provide an avenue of infection at any time. Nearly 90 percent of the cull lumber produced in this study was from the butt logs. No rot was found in any portion above the second log.

5. When Heart Rot Is Found In A Log,  
What Deduction Should Scalers Apply?

The following scaling practices (based on the limited observations made during this study) may be used as a rough guide for Virginia pine sawlogs. Results of further studies may modify these.

- A. Total cull
  - 1. Logs with two or more sporophores several feet apart.
  - 2. Logs with one or more sporophores and visible rot at both ends.
  - 3. Logs without sporophores but with visible rot at both ends.
  
- B. Fifty percent cull
  - 1. Logs with one sporophore and no visible rot or at one end only.
  - 2. Logs without sporophores but with incipient rot at both ends.
  
- C. No cull
  - 1. Logs without sporophores but with incipient rot at one end only.
  - 2. Logs with any of the abnormalities listed in the answer to question No. 1.

One important point to consider, even before felling and bucking, is that rot may be so extensive that a tree will not pay its way out of the woods. Trees in this condition would be those with fruiting bodies so spaced that they could not be contained on one log.

6. Is Heart Rot Likely  
To Affect Yield Of Pulpwood?

Losses from heart rot in pulpwood stands are apparently so small they can be discounted. An examination of several hundred random pulpwood bolts from a 40-year-old Virginia pine stand disclosed only one instance of heart rot, and it was but a trace. Most pulpwood is produced from stands no older than this or is taken from the unaffected tops of sawlog trees.

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