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## CONK ROT AND GOITRE

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### 9.0 Assessing Conk, Indian Paint Fungus and Pin Rot

While conk is the name used for the mushroom-like fruiting body often seen on standing timber which indicates a fungal invasion of a tree, for scaling purposes conk refers to the types of rot which attack lignin (the glue) and leaves cellulose fibre more-or-less intact. It includes white rot, pin rot, and paint brush. In the early stages the wood is only stained purple or light pink and requires no firmwood deduction. In later stages, the wood breaks down to form a honeycomb appearance, maybe identifiable at the end of a log by the white, yellow, orange or brown fleck that is characteristic of conk rots.

During logging operations the external conk indicators are usually knocked off, leaving brown, yellowish brown, and/or orange powdery residues at the entry points. These residues are what a scaler looks for in assessing a log, because their presence indicates conk rot. Conk knots should not be confused with rotten branch stubs, which may not indicate the presence of heart rot. Observation of the ends of logs, where they have been bucked through rotten knots, will indicate the differences in appearance.

Generally, the point of deepest penetration of conk rot is where a fruiting body enters the log. It commonly takes the shape of a crescent, and continues to spread through the cross-section of the tree. It can form into one or more full rings, which tend to follow the growth rings. Eventually it affects the entire heart. In the various configurations, firmwood deductions are taken according to the basic shape that is most suitable.

If rot does not show at either end of the log but its presence is indicated by conk knots, the challenge is to make a reasonable determination of its range, based only on its indicators. The indicators and the assessment of them are described in the following section on conk rots.

### 9.1 Basic Conk Assessments

Because of the variability of the effects of conk, not only by species of conk but by the tree species and location around the Yukon, it is very difficult to establish with conviction any deduction method that will have universal application. Mill visits and experiences are essential for a scaler to learn to interpret the meaning of conk indicators.

In general:

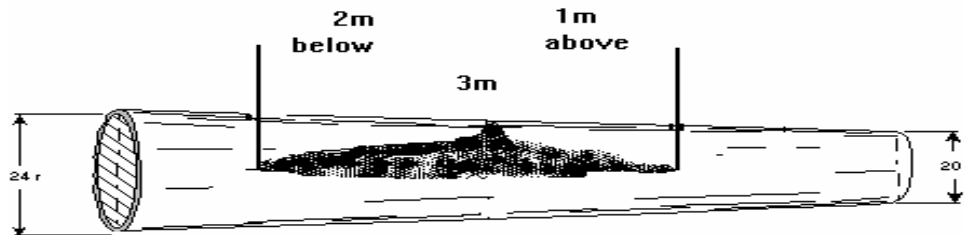
1. Conk can appear in several ways on logs and the indicators present affect the estimates for making firmwood deductions and grading. The location of conk knots and the diameter of rot on log ends may be used to estimate the distances that rot travels. That is, the observation of these relationships will help indicate whether the rot is getting worse down the log or running out.

2. When conk stain or conk rot shows in log end(s) carefully look for conks on the log. Use the tine of the scale stick or a spud to dig into swollen spots, punk knots, and black knots. Size of conks is sometimes helpful in determining the extent of rot in some species.
3. Where there are two or more indications of conk, they are normally presumed to be connected.
4. If, among the enclosed rot, there is a substantial amount of firmwood, then the defect diameter should be reduced proportionately for the firmwood volume determination.
5. In logs where conk shows in one or more knots and only a small amount of rot is present in the log end, and the scaler is positive that the rot showing in the end is not representative of the severity of the defect, then the firmwood deduction may be increased to one half the length that the conk is estimated to extend.
6. Where very large and/or numerous conks are present, an additional length deduction may be required to compensate for the funnel effect of the path of rot from the outside of the tree into the central cylinder of rot. In no case will this deduction exceed 0.1 m for every two knots.

## **9.2 Assessing Conk Rot; Visible Conk Knot(s), No Rot Visible**

If the scaler observes conk knots but no rot shows at the ends of a log, the following conventions are commonly used:

1. Conk rot generally extends further down from a conk knot than up. Given no other indicators to the contrary, it may be presumed that the conk rot extends, on the average, 1 m above the highest conk knot and 2 m below the lowest conk knot. Where a conk knot is located closer to the top end or closer to the butt end than the above methods, presume that the defect will travel one half the distance between the last knot and the log end.
2. When a conk knot is the only indication of conk and the severity of the rot is unknown, the firmwood deduction may be calculated as one half the estimated length of the defect, or the diameter of the rot is assumed to be one-half the average diameter of the log for the full length of the defect.
3. Where there are conk knots and no sign of rot at the ends of a log, the scaler should, if possible, have the log bucked and/or observe the processing of the log to get a better idea of the internal effects of conks in their area.



*Figure 9.1 Assumed extent of rot based on knots displaying conk*

The conk knot is the only indication of conk, therefore the firmwood deduction may be calculated as one half the estimated length of the defect.

The defect is estimated to travel 3m.

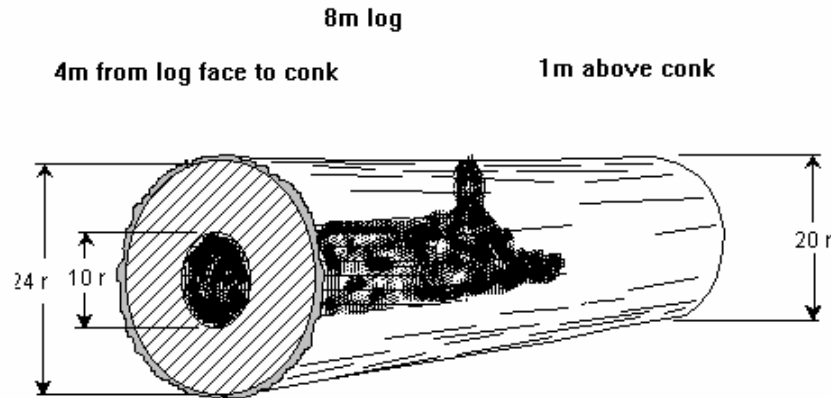
3m divided by 2 = 1.5m

1.5m-length deduction

### 9.3 Assessing Conk Rot; Visible Conk Knot(s), Rot Visible at One End

If a scaler observes one or more conk knots and conk rot showing in one end of a log, the following guides will serve in the assessment of the log:

1. Where conk shows in the top end of a log and there are conk knots, the rot should be run the greater distance of half the log length to a maximum of 4 m or 2 m below the last conk knot. If the last conk knot is closer to the butt end than 2 m, it may then be presumed to travel one-half the distance between the knot and the butt end.
2. Where conk shows in the butt end of a log and there are conk knots, the rot should be run the greater distance of half the log length to a maximum of 4 m or 1 m above the last conk knot. If the last conk knot is closer to the top end than 1 m, it may then be presumed to travel one-half the distance between the knot and the top end.
3. Where conk rot is visible in the butt end of a butt cut log, and there are conk knots present, the rot is treated as conk rot, not butt rot. Therefore, it is scaled as a cylinder extending from the butt end, rather than as a cone.



*Figure 9.2 Log with conk knot and rot visible at one end*

### 9.3.1 Field Calculation - Length Deduction

To reduce the recorded length measurement of the log to create a log with net dimensions equal to the net volume in the example, follow these steps:

Top defect volume

$$\begin{aligned} \text{Half volume of } 5.0/10 &= 79 \text{ dm}^3 \\ \text{Full volume of } 5.0/10/10 &= 158 \text{ dm}^3 \text{ (2 x the half volume)} \end{aligned}$$

Calculate the average unit volume for the log by adding the ten metre half volumes of the end measurements of the log and dividing by ten.

$$\begin{aligned} \text{Half volume of } 10.0/20 &= 628 \text{ dm}^3 \\ \text{Half volume of } 10.0/24 &= +905 \text{ dm}^3 \\ \text{Full volume of } 10.0/20/24 &= 1533 \text{ dm}^3 \\ \text{Full volume of } 01.0/20/24 &= 153 \text{ dm}^3 \end{aligned}$$

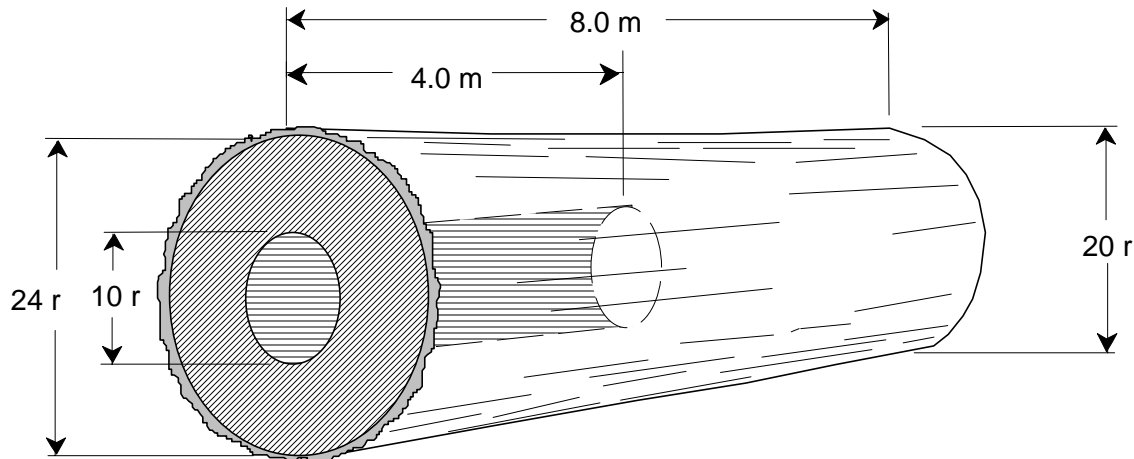
Calculate the length deduction by dividing the defect volume by the average unit volume of the log:

$$\frac{158}{153} = 1.03 \text{ m}$$

The length deduction rounded is 1.3 m.

### 9.4 Conk Rot; No Visible Conk Knot(s), Rot Visible at One End

Where conk rot is visible in one end of a log and there are no conk knots present, the rot is presumed to travel half the length of the log to a maximum of 4 m. Where conk rot is contained by an annual ring and run half the length of the log, it is treated like heart rot and a diameter deduction may be made.



*Figure 9.3 Log with conk rot visible at one end but no rotten knots*

#### 9.4.1 Field Calculation - Length Deduction

To reduce the recorded length measurement of the log to create a log with net dimensions equal to the net volume in the example, follow these steps:

Top defect volume

$$\begin{aligned} \text{Half volume of } 4.0/10 &= 63 \text{ dm}^3 \\ \text{Full volume of } 4.0/10/10 &= 126 \text{ dm}^3 \text{ (2 x the half volume)} \end{aligned}$$

Calculate the average unit volume for the log by adding the ten metre half volumes of the end measurements of the log and dividing by ten.

$$\begin{aligned} \text{Half volume of } 10.0/20 &= 628 \text{ dm}^3 \\ \text{Half volume of } 10.0/24 &= + 905 \text{ dm}^3 \\ \text{Full volume of } 10.0/20/24 &= 1533 \text{ dm}^3 \\ \text{Full volume of } 01.0/20/24 &= 153 \text{ dm}^3 \end{aligned}$$

Calculate the length deduction by dividing the defect volume by the average unit volume of the log:

$$\frac{126}{153} = 0.824 \text{ m}$$

The length deduction rounded is 0.8 m.



*Figure 9.4 Conk knot on a spruce log*



*Figure 9.5 Conk knot on a spruce log*



*Figure 9.6 Another example of a conk knot on a spruce log*

### **9.5 Assessing Goitre**

Goitre is a swelling or abnormal growth on a tree and rot may be associated with this defect. Internal rot seldom travels more than 1 m above and below the goitre. The volume of the rot may be assumed to be one-half of the defective volume. For example, if the rot is estimated to travel two metres, the volume deduction will be 1 m of length.



*Figure 9.7 A log displaying swelling*