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Compression wood identification in pulpwood

1. Scope

1.1 This method is concerned with the detection of the compression wood that can be recognized by unaided vision or by means of a simple viewing device (1). Normally this is sufficient for operating purposes. Microscopic and chemical tests may be required in special cases.

1.2 Severe and intermediate forms of compression wood are easily recognized, once the observer becomes familiar with their general characteristics. The borderline form requires some practice to distinguish it from normal wood. A viewing box is useful for training an observer and as an aid in deciding doubtful cases.

2. Significance

Compression wood is a type of abnormal structure that forms on the lower sides of leaning trunks and the branches of all coniferous species (2). For most uses of wood, its presence is undesirable; in pulpwood it may cause lower pulp yields, lower pulp strength, and pulp bleaching difficulties (3). Its effects vary according to the form and quantity of abnormal fibers present. Although compression wood may amount to a considerable proportion in some logs, the overall quantity is generally not large enough to give serious trouble in pulping. It can occur, however, in a large portion of certain trees and so affect the general quality of pulpwood cuttings. An influx of such material into a mill system can well be the explanation for a sudden fluctuation in pulp quality.

3. Definitions

3.1 Compression wood is ordinarily distinguishable in a log's transverse section by eccentric and wide annual growth rings. Earlywood (sometimes referred to as springwood) is that portion of the annual increment of growth which is produced at the beginning of the growing season (usually in the spring, hence, springwood). Latewood or summerwood is that portion produced during the latter part of the growing season (during the summer). The combination of earlywood and latewood forms the growth ring, sometimes referred to as the annual ring. Seemingly large latewood areas in the wider parts of the rings are actually earlywood and latewood compression tracheids. Compression wood may be confined to a few growth rings, or it may comprise from one-third to one-half of the cross section. Compared with the

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normal wood, it has a “lifeless” appearance which is the result of lack of contrast between earlywood and latewood. It differs from normal wood in gross anatomy, minute structure of the individual fibers, and in chemical composition. It occurs in gradually merging forms, from that which differs distinctly from normal wood to that which is recognizable only by microscopic examination.

3.2 In general, compression wood may be divided into two broad classes:

3.2.1 Severe and intermediate forms (Figs. 1-3), which are conspicuous and easily recognized on sight (4, 5).

3.2.2 Borderline forms, which require some experience to recognize with the unaided eye and may need microscopic examination to identify positively.

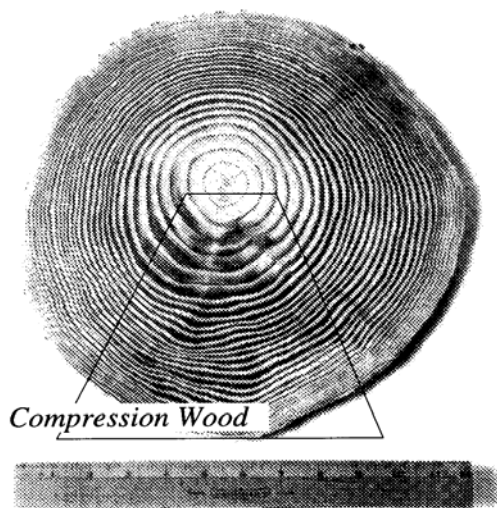


Fig. 1. Cross-section of loblolly pine with annual rings of moderate width; normal wood in upper portion, and pronounced compression wood in central part of lower portion.



Fig. 2. Cross-section of black spruce pulpwood showing pronounced compression wood in lower portion.