TREE HEIGHT AND CROWN MEASUREMENTS INSTRUCTIONS

Introduction

Crown measurements are taken on all timber inventory or TI trees (DBH ≥9.5cm) within the S-10 strip. Measurements consist of crown radius distance in four directions, crown height, and live crown ratio. This information will be correlated with shigometer readings taken from the same trees to assess tree vigor.

Procedure

Data are recorded on polycorders. Each quadrat's data are recorded in a separate file and named "CMquadrat," e.g., CM3E1. The polycorder format file is named CROWN-FMT.

1. Take a checklist of either shigometer data or TI trees within the S-10. As each tree is measured, make a chalk mark on the tree and check off the tree number on the list. This makes it easy to identify overlooked trees.
2. *Crown radius.* The crown radius is measured in four directions. They should approximate the cardinal directions but be parallel and perpendicular to the S-10 lines. Directions can be estimated in the field.

   Stick the tack of the logger's tape into the bole on the side of the tree approximately even with the tree's center so that the crown radius measurement starts at the tree's center. Walk away from the bole in the selected direction. Measure the radius where the tape crosses under the live crown. Be sure that the tape is parallel to the ground and that the point where the crown radius is measured is directly under the edge of the crown. Repeat the same in the three other directions.

   After recording the tree number, record the radius measurements on the polycorder under the prompts NORTH RAD, EAST RAD, SOUTH RAD, and WEST RAD. Distances should be recorded to the nearest 0.1 m.
3. *Height and live crown ratio.* The live crown ratio is an estimate (expressed as a percentage) of the portion of the tree height that has live branches (see Figure 3–8a). The height and live crown ratio (LCR) are measured with a clinometer (percentage scale) and a tape measure. To take the measurements, the recorder positions him/herself at a sighting location where (1) the distance from the tree equals

or exceeds the height of the tree and (2) the tree's top, base, and live crown bottom can be seen.

a. Measure the distance from the tree to the sighting location and input on the polycorder under the prompt HT DIST.
b. Use a clinometer to measure the angle of sight to the top of the tree (TOP %), the base of the tree (BOT %), and the bottom of the live crown (LCR %). The clinometer is read on the right side of the scale (the + and percentage scale) to the nearest percentage (see Figure 3–8b). When gaps within the crown are greater than one-half the height of the main crown, they are excluded from the estimate; the heights of upper and lower portions of the crown are added together for the total figure. Any living branches are considered part of the live crown (see Figure 3–8a). A note should be made on the check list to indicate trees where epicormic branches make up a portion of the live crown.

Equipment

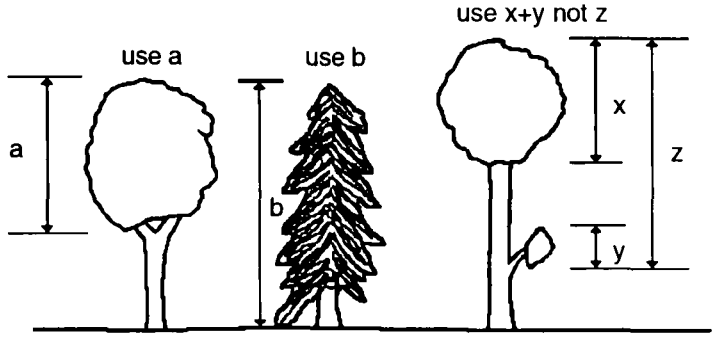
Polycorder
Pencil
Compass
Chalk holders
Clinometer
List of TI or shigometer trees in S-10 strip
Tree marking chalk
50m loggers tape

Evaluation

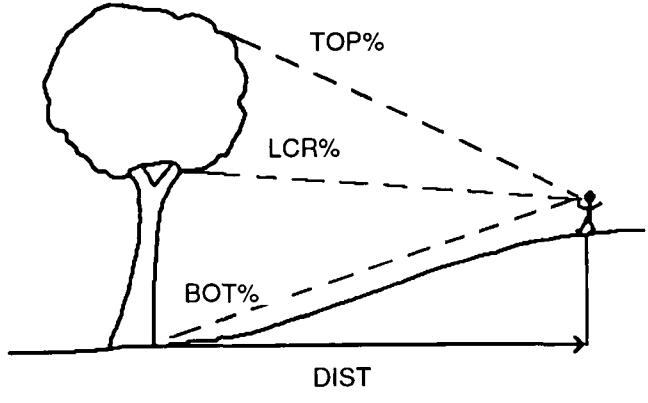
These methods adequately document the general size and shape of the tree crown. Although primarily designed for comparison with tree vigor measurements, when repeated they may also provide a look at temporal and spatial changes in tree crowns particularly in harvested areas where a response to harvesting by the remaining trees would be expected. More detailed mapping of the crowns would require that more crown radii be measured and probably at multiple heights.

Date: 18 JUL 89 File name: CROWNMAP.INS

Figure 3–8. Live crown ratio and height and live crown measurement.



a. Live crown ratio



b. Height and live crown measurement
Tree height = [(TOP%–BOT%)×DIST]÷100
Live crown ratio = [(TOP%–LCR%)×DIST]÷Tree height