






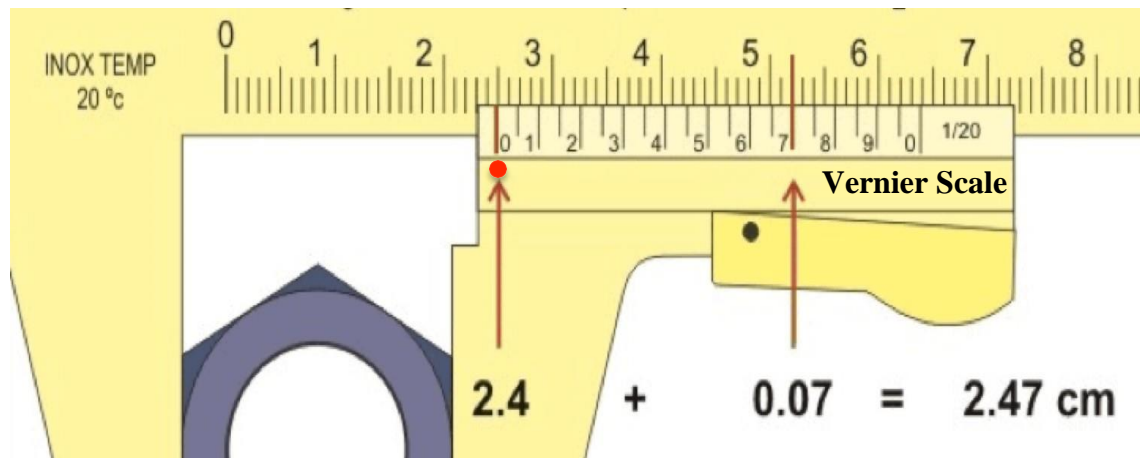
Measurement Training for Young to Semi-Mature Planted Trees to determine which species will be successful as the climate changes.

Data: Use a measuring tape and vernier calipers. Record this season's measurement on the sheet in the blank column spaces for each separate measurement. Include the decimal points.

Location: Make sketch map of area. Measure between trees and record distance.

	<p>1. TREE TAGS: For longer monitoring records use metal tags e.g. aluminum. Tree metal tags may be attached by a cable tie or wire. Numbers on the tag represent site, planting season and year, and tree number left to right. (e.g. AAA-F16-01 = Aurora Arboretum, Fall 2016, and tree #1.</p>
	<p>2. ROOT COLLAR DIAMETER (RC, in mm) This is the thickness of root collar or where the stem meets the ground. Measure the widest part of the root collar. Use vernier calipers. Gently place the jaws around the root collar. Be gentle so you don't scrape the bark. To read the measurement, find where the 0 on the bottom of the sliding scale lines up with the non-sliding scale. Record the measurement on the non-sliding scale.</p> <p>*NOTE: Keep the calipers flat and next to the ground.</p>
	<p>3. TOTAL HEIGHT (HT in cm) Use the 1.5 meters tape to measure from root collar to top end of stem - the base of terminal bud on the tallest leader - the latest growth. Do NOT touch the terminal bud as it is very fragile and the source of all vertical growth from the main stem. Do not measure the leaves on deciduous trees.</p>
	<p>4. TRUNK DIAMETER (DBH, in mm) for young trees that are more than 1.3 meters tall. Use the vernier calipers that are used for the root collar (RC) measurement. Measure the widest part of the diameter and record the diameter at 1.3 meters.</p> <p>*NOTE: If the stem of the tree is larger than 4 cm DBH at 1.3 meters it is a mature tree.</p>
	<p>. CROWN AREA (W1, W2, in cm) Use the 1.5 meter tape and measure 2 widths at right angles horizontally. Choose the widest points of the tip of the branch (CW1). CW2 will be perpendicular to CW1. Do not include the leaves in the measurement. Measure to the tip of the branch.</p>

HOW TO READ THE VERNIER CALIPER:



2nd DECIMAL PLACE

Find the second decimal place by choosing the straightest vertical line formed by sliding and non-sliding parts. Read the number on the sliding part of the caliper next to the straight line. Here the reading is 7, so the measurement is 2.47 cm or 24.7 mm.

Who was Vernier?

French Mathematician Pierre Vernier (1580 – 1637), born in Ornans, France, invented the Vernier scale in 1631, the moving part was developed to provide precise readings for measurement.