

Tree-Planting Interval Indicator

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Design and trials of a custom-built tree planting interval indicator are described. Intervals are accurate to 5 centimeters in 30 meters.

Increasing demand for fiber for pulp and energy has created interest in short-rotation, intensively cultured (SRIC) forest systems. However, many practical problems need to be solved before such systems will be economical. One of these problems is maintaining uniform spacing between trees in large plantations. Trees in an SRIC plantation are spaced much closer together than in conventional forestry practice, and precise spacing is critical to maximum utilization of the site. Most planting is done with semi-manual planting machines, allowing human error. A spacing device is needed to help increase planting accuracy and efficiency.

To satisfy this need, engineers at the Forestry Sciences Laboratory in Houghton, Mich., designed and built a "tree-planting interval indicator" (fig. 1). This device, normally used with semimanual planting machines, "beeps" at prescribed intervals, signaling the operator to insert a tree into the ground.

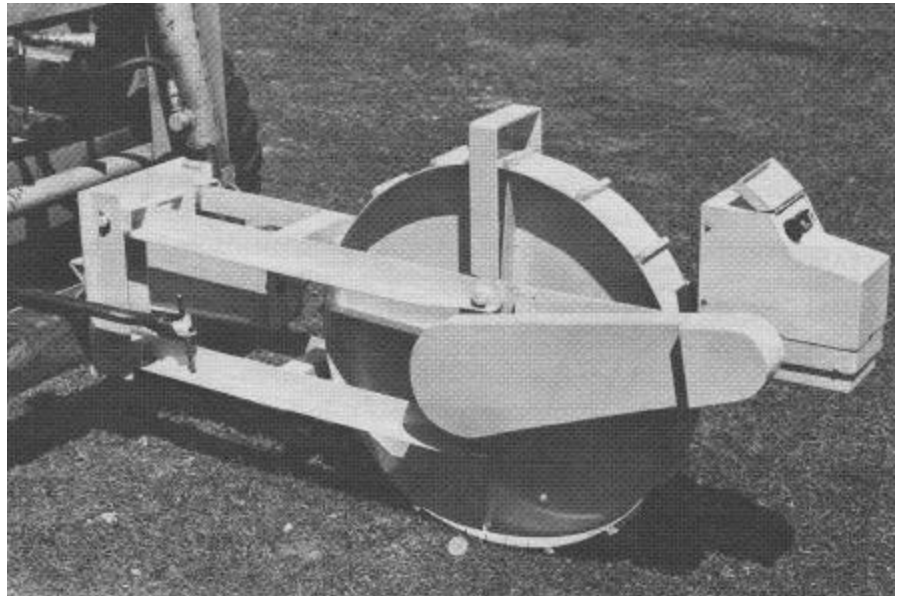


Figure 1.—*Tree-planting interval indicator.*

The tree-planting interval indicator is a self-contained, wheeled device designed to measure intervals. This design allows for intervals up to 250 meters in 0.25-meter increments, although only spacings up to 4 meters are of practical use. There is no limit to the length of a planting run. Before each run, simply set the indicator at zero to insure that a full measurement will be included in the first interval.

The indicator consists of a large, distance-measuring wheel connected to a smaller nonferrous sensor wheel by a cog belt. The sensor wheel is embedded with magnets and is sized so

that each revolution equals 1 meter in linear travel on the larger wheel (fig. 2). To set the indicator to the desired interval, adjust the counter circuitry to correspond to the distance in quarter meters. The device will "beep" when the counter resets.

The costs for materials for construction of the tree-planting interval indicator were approximately \$150 for the frame assembly and belt drive and \$265 for the electrical components. Approximately 96 hours of labor went into construction. Specifications and construction plans are available from the authors.

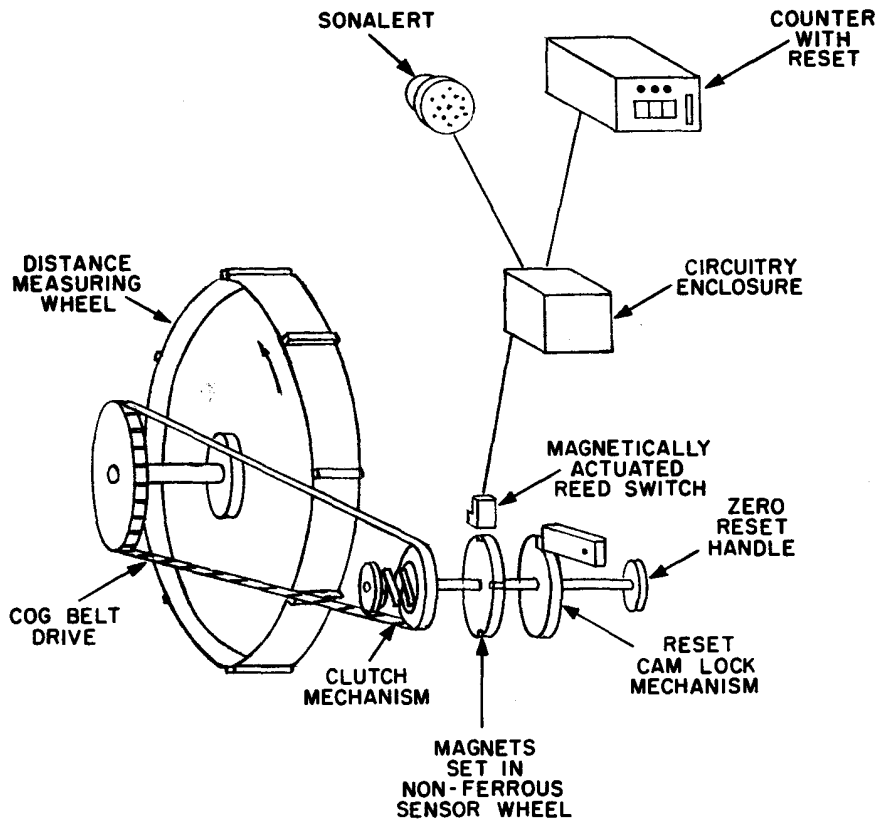


Figure 2.—Simplified diagram of the tree-planting interval indicator showing the mechanical and electrical relations.

The indicator is currently in use at the experimental farm of the Forestry Sciences Laboratory at Rhinelander, Wis., to facilitate work with SRIC Populus (fig. 3). The tree-planting interval indicator has proven accurate to 5 centimeters in 30 meters on level ground. The added accuracy and closer tolerances achievable with this device greatly enhance the control of spacing in SRIC plantations.



Figure 3.—The tree-planting interval indicator in use with semimanual transplanters at the experimental farm of the forestry Sciences Laboratory, Rhinelander, Wis.