

## New tree pulier increases yield 20%



A new tree harvester that extracts both taproot and stem makes a pine tree 20 percent more useful. The machine shears the lateral roots close to the taproot and then plucks the entire tree from the ground like a carrot. The concept was developed by Dr. Peter Koch at the U.S. Forest Service's Southern Forest Experiment Station in Pineville, La. The shearing apparatus is mounted on a John Deere 544 or Caterpillar 920 prime mover, which serves as a crane.

Two elements are central to its design: The first is a scissors-type grip equipped with a pair of tough horizontal knife blades that close at the ground line and bite several inches into the stem from opposite sides of the tree. The second element is a clamshell-hinged tubular shear, 22 inches in diameter, that is sharpened on the lower edge. With the scissors-grip as an anchor, the shear is forced vertically into the ground to a depth of about 11 inches, severing the lateral roots. At this depth, broad steps on opposite sides of the shear strike the ground to limit further penetration. Now, putting more force on the shear causes the steps to bear against the ground and the grip to rise about nine inches, jacking the tree free of the ground with the taproot attached. Finally, the entire tree is lifted into the air and bunched for skidding.

The harvester was designed specifically to extract the taproot with the rest of the tree. Until now, pine trees were felled above ground and their taproots left in the soil to rot—there was no way to harvest them. The taproot of a 15-30-year-old slash pine weighs about 20 percent as much as the usable bark-free stem (the part that grows above ground), and is suitable for pulping.

Pulling the taproots not only increases per-acre fiber production—it also significantly reduces the cost of preparing new sites for regeneration.—Ed Kerr