Tree Size Is Best Indicator of Carbon Storage

The circles represent cross-sectional areas of tree trunks.

Increased area is 1.2 ft². Same for all three.

The small black ring expands to the red ring.
Medium blue ring expands to the yellow ring.
Large green ring expands to the purple ring.

Lesson: A narrow ring on a big trunk can add as much cross-sectional area as a wide ring on a small trunk!

Source: Robert Leverett, Cofounder, Native Tree Society, 2023, unpublished
CARBON ROCK STARS: LARGE, OLDER TREES AND FORESTS

How many oak trees does it take to store 8 tons of carbon?

1 Mature Canopy Tree
100’ tall x 54” dia

35 Young Canopy Trees
50’ tall x 12” dia

151 Typical Street Trees
40’ tall x 6” dia

465 New Large Landscape Trees
25’ tall x 4” dia

“A large northern red oak measures 14 feet in circumference [54 inches diameter at breast height (dbh)]. Its height is 100 feet. Approximately 50% of this dry weight is carbon, or 7.7 tons. This amount of carbon has a CO2 equivalency of 28.2 tons. Let’s say we have a 12-inch dbh, 50-foot tall, young northern red oak. It would take 35 young trees to match the carbon of the one large oak. Using a 6-inch dbh, 40-feet tall oak, the number of young trees needed to match the one big tree soars to 151! Finally, let’s drop to a 4-inch DBH and 25-foot height. The number of oaks required skyrockets to 465! It takes 10 or more years to get a young red oak up to this [4-inch dbh] size...Let’s take a young, newly planted tree from nursery stock...its diameter is 1 inch and it is 4.5 feet tall...it would take 61,364 newly planted trees to match the carbon in our one large oak, and they would be three years old!...Assuming each 1-inch diameter seedling controls only 5 ft² of ground space, then the total area needed to hold the seedlings becomes...7.0 acres... The lesson is clear: Save big trees where possible.” - Robert Leverett, Cofounder, Native Tree Society


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