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Where are the black walnut trees in Iowa?

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The third measurement of Iowa's forests was completed in 1990 by the North Central Forest Experiment Station and the Iowa Department of Natural Resources (Brand and Walkowiak 1991). The inventory found that black walnut trees are common in the forests of Iowa. Two out of every hundred trees in the State are black walnuts. To accomplish the inventory, more than 12,769 potential sample points were examined on aerial photos. Of these, 632 forest plots were visited and measured. Although most of Iowa is farmland, 2.05 million forest acres covered 5.7 percent of the State. Field crews found walnut on 27 percent (192) of the plots they measured as shown in Figure 1.

Ninety-five percent of Iowa's forests or 1.94 million acres were classified as timberland--forest land producing or capable of producing crops of industrial wood and not withdrawn from timber utilization. We estimate that black walnut trees can be found on 600,400 acres of timberland or one out of every three timberland acres.

Field crews found at least 63 different tree species growing in the forests of Iowa. Black walnut was the nineteenth most common species found but ranked eighth in terms of total sawtimber volume. Walnut trees were not as abundant as the American elm -- the most common tree species – yet walnut trees were found more frequently than white ash, sugar maple, and even cottonwood. Black walnut trees were found in the forests of 59 of the 99 counties in the State

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(Figure 2). In 15 counties, walnut could be found on 50 percent or more of the timberland in the county. The top 10 walnut-growing counties in Iowa, based on total growing stock volume, were Allamakee, Dubuque, Tama, Jackson, Monona, Muscatine, Clayton, Madison, Pottawattami, and Taylor. Allamakee County was the clear leader with 50,800 acres with walnut trees and more than twice as much walnut growing stock volume as any other county, 10.5 million cubic feet. Four counties -- Monona, Tama, Boone, and Butler -- had more than 1,000 board-feet of walnut sawtimber on the acres where walnut occurs, and another 11 counties had at least 500 board-feet on walnut acres.

Based on the 1990 forest inventory, Iowa had 16.8 million live walnut trees larger than 1 inch in diameter on all forest land. There were 13.6 million walnut growing stock trees -- those that meet specified standards of size, quality, and merchantability. The other 3.2 million live black walnut trees were classified as either rough or rotten or occurred on land that could not qualify as timberland. The forest inventory does not measure walnuts growing in urban areas or in areas not classified as forest, so these figures underestimate the total number of walnut trees that could be in Iowa. Figure 3 shows the number of live walnut trees by diameter class. The abundant number of saplings in the 2-inch diameter class suggests that significant opportunities exist to enhance and increase the walnut resource in Iowa through careful protection and management of these young trees. The largest walnut tree found was 29 inches in diameter. Most trees in the 24 inch diameter class or larger, 65 percent, were rough or rotten.

Some inventory plots were relocated and remeasured from the previous survey done in 1974 (Spencer and Jakes 1980). These 401 remeasured plots provide a useful way to measure forest characteristics such as diameter growth. An analysis of new and old diameters from remeasured trees shows that the average radial growth was 0.076 inches per year. So, black walnut trees in Iowa can be expected to grow an inch in diameter, on average, every 6.5 years.

Comparing statistics from recent forest inventories to earlier inventories is always tricky, because some definitions change in the interim. However, the 1974 inventory estimated that there were

10.6 million black walnut trees on timberland, fewer than the number found in 1990. We estimate that the number of walnut trees have increased by as much as 29 percent over the 16 year remeasurement period.

Timber volume is usually represented by the cubic-foot volume in growing stock trees and the board-foot volume in sawtimber-sized trees. The State had 63.1 million cubic feet of walnut growing stock timber on timberland with 60 percent in the sawlog portion of sawtimber-size trees. These growing stock trees contain 221 million board-feet (MMbf) of sawtimber based on the International _ log rule. The inventory did not record any sawtimber volume in merchantable portions of rough and rotten trees. The 14-inch diameter class had the greatest concentration of sawtimber volume, 61 MMbf. Based on inventory records of sawtimber trees that were graded, about 16 percent of the sawtimber trees were tree grade 1, 33 percent were grade 2, and 41 percent were grade 3. Ten percent were below grade.

The forest inventory describes many dimensions of the timber resource such as ownership, forest types, site productivity, and treatment opportunities for improving forest productivity. The inventory shows that farmers own 68 percent of the acres where walnut trees occur, but these acres have 72 percent of the sawtimber volume. Other private individuals and other private corporations own 22 percent and 5 percent of the walnut acres, respectively. The inventory also shows that most of the walnut trees in Iowa are growing on highly productive forest acres. Eighty four percent of the acres where walnut trees were found can produce at least 50 cubic feet or more of solid wood annually. One-third of the walnut acres can grow at least 85 cubic feet of wood each year. The inventory also shows that 92 percent of the walnut trees in the State occur in only three forest types. The maple-beech-birch type has 36 percent of the acres and 56 percent of the sawtimber volume. The white oak-red oak-hickory forest type has 35 percent of the acres, but only 21 percent of the sawtimber volume. The black ash-elm-red maple type has about 21 percent of the acres and about 20 percent of the sawtimber. The remaining eight percent of the timberland acres with walnut trees are other forest types dominated by eastern redcedar or mixed central hardwoods.

The forest inventory also provides a useful method for judging the extent of opportunities for improving forest productivity. Most of the acres with walnut trees, 48 percent, were in good shape and no treatment was indicated. The survey showed, however, that commercial harvesting could improve productivity on 32 percent of the timberland where walnut occurs.

Forests comprise 5.7 percent of Iowa's land and walnut trees are an important and valuable component, especially for farmers and other private landowners. Based on our data, it's likely that the walnut resource in Iowa is worth $100 million dollars or more on the stump and much more when processed by the 65 sawmills and one veneer mill in the State. Timber product output reports are also done by the North Central Forest Experiment Station in cooperation with the State and provide another measure of the timber volumes produced in the State. The most recent report for 1988 (Smith and Tibben 1990) indicates that 3.6 million board-feet of walnut sawlogs and 1.1 million board-feet of black walnut veneer logs were produced in 1988. This is down about 27 percent from comparable figures for 1980 (Blyth, Tibben, and Smith 1984). This production level represents a highly sustainable annual production rate of slightly more than 2 percent of the walnut sawtimber inventory.

The forest inventory data and reports provide a useful source to learn more about the forest resource in each State. For more information on the forests in Iowa or any other North Central state, contact your State Forester, or the Forest Inventory and Analysis Unit, North Central Forest Experiment Station, 1992 Folwell Avenue, St. Paul, MN 55108, phone 612-649-5139. Plot and tree measurement records are available in data base format in the Eastwide Forest Inventory Data Base (Hansen, et al. 1992).

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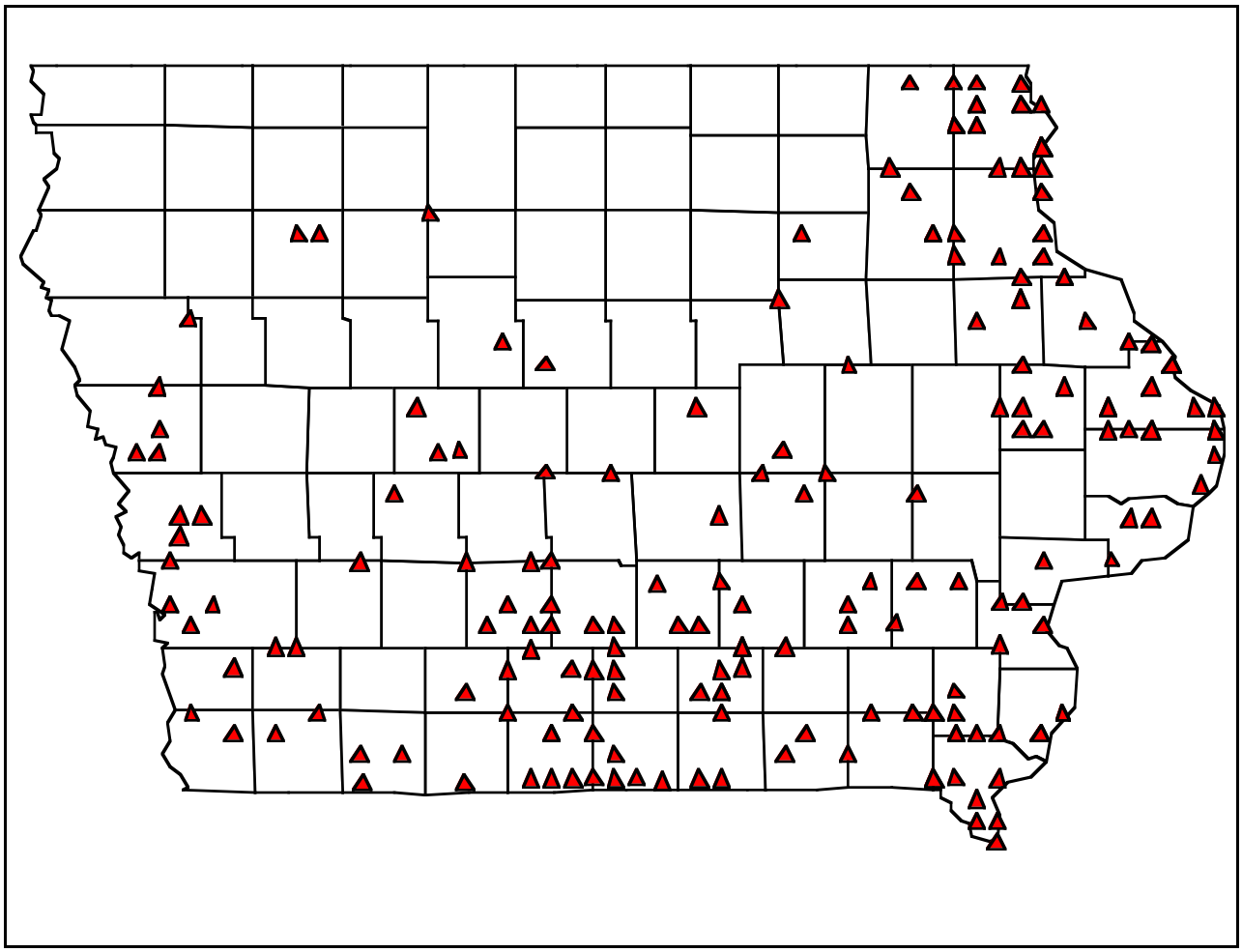

Figure 1: Location of forest inventory plots in Iowa where black walnut trees were found in the 1990 forest survey.

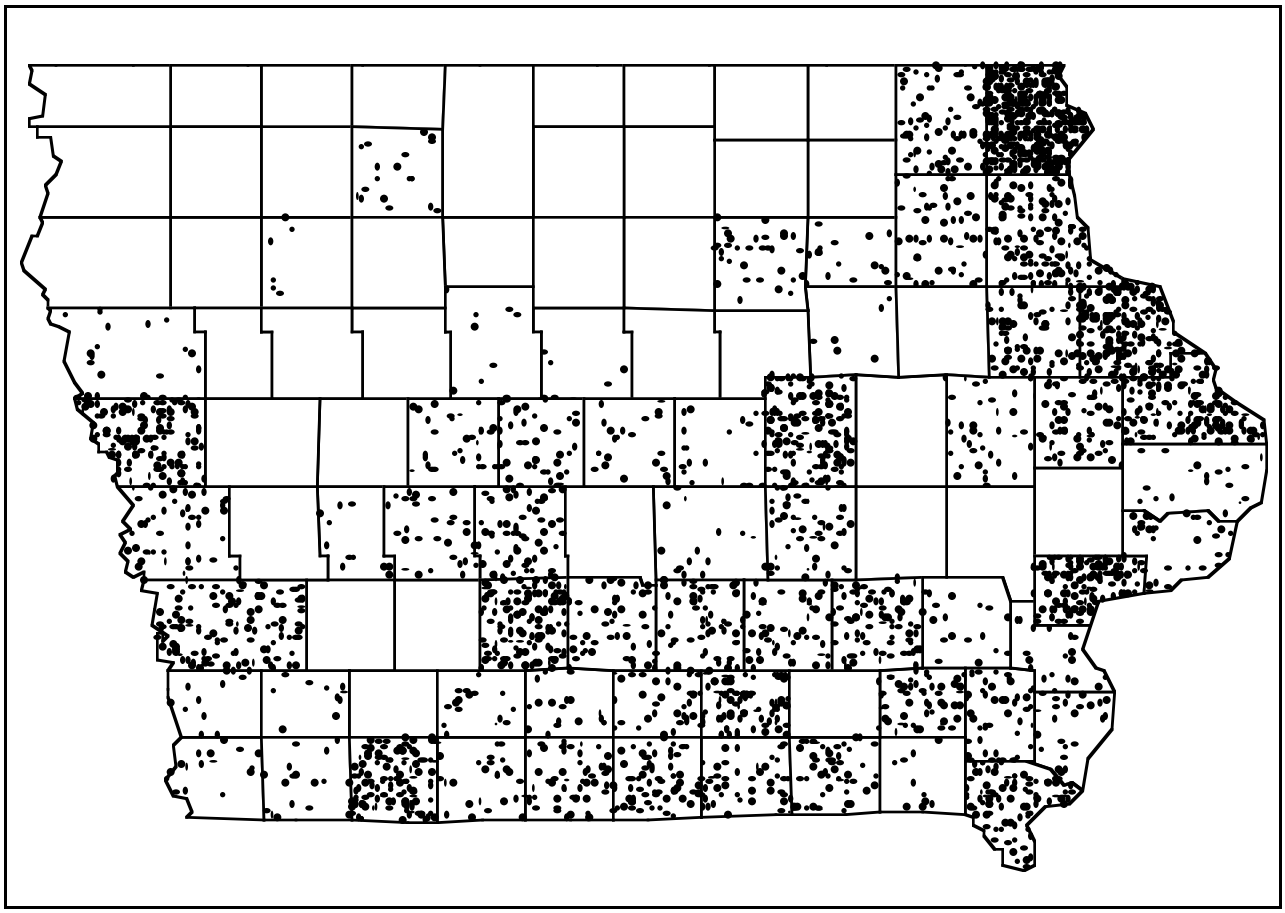

Figure 2: Distribution of black walnut growing stock volume on timberland for Iowa counties. Each dot represents 25,000 cubic feet of growing stock timber. Dots are shown randomly distributed in each county and do not represent exact locations.

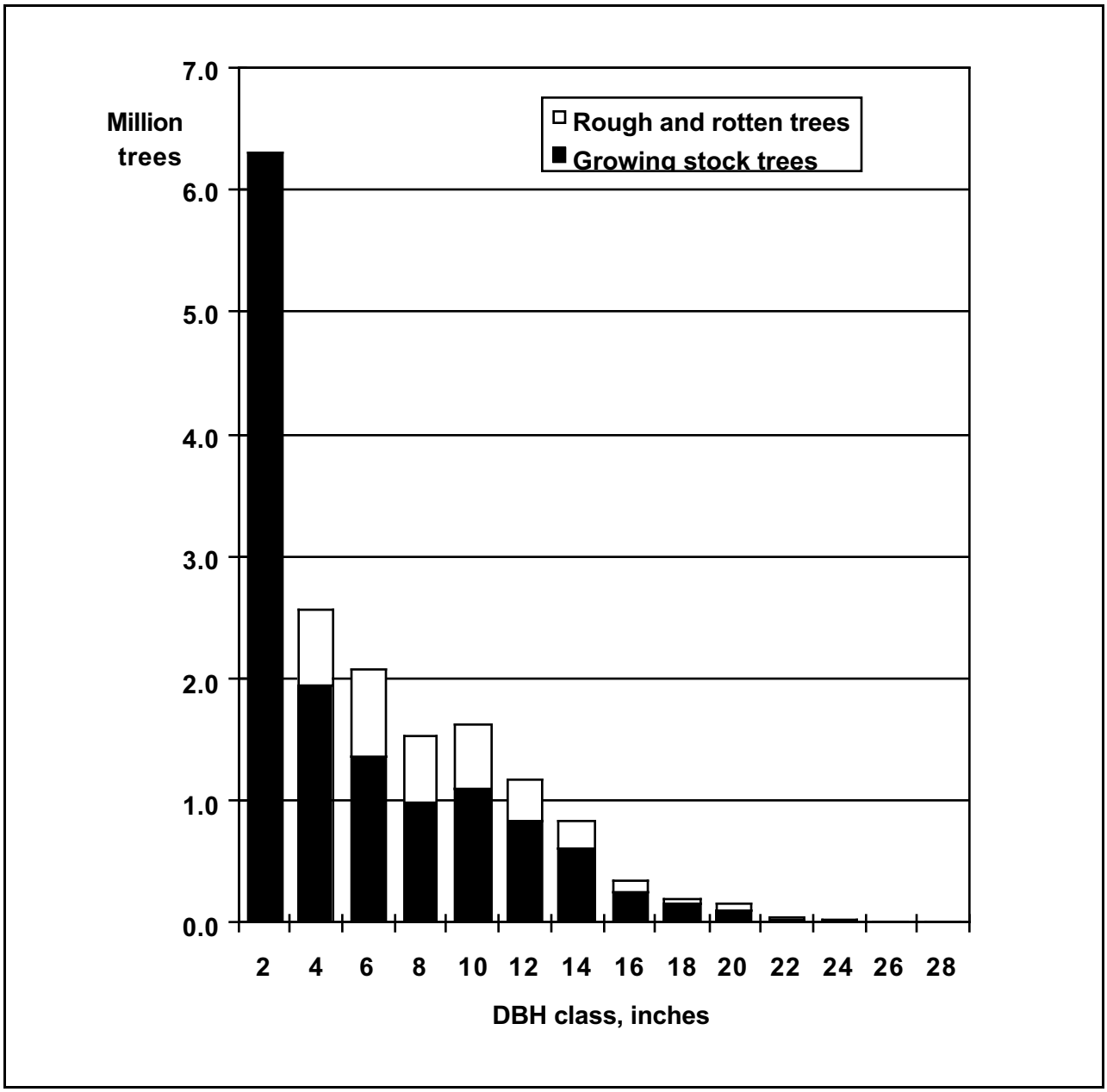

Figure 3: Estimated number of black walnut trees on timberland in Iowa, 1990, by diameter class.

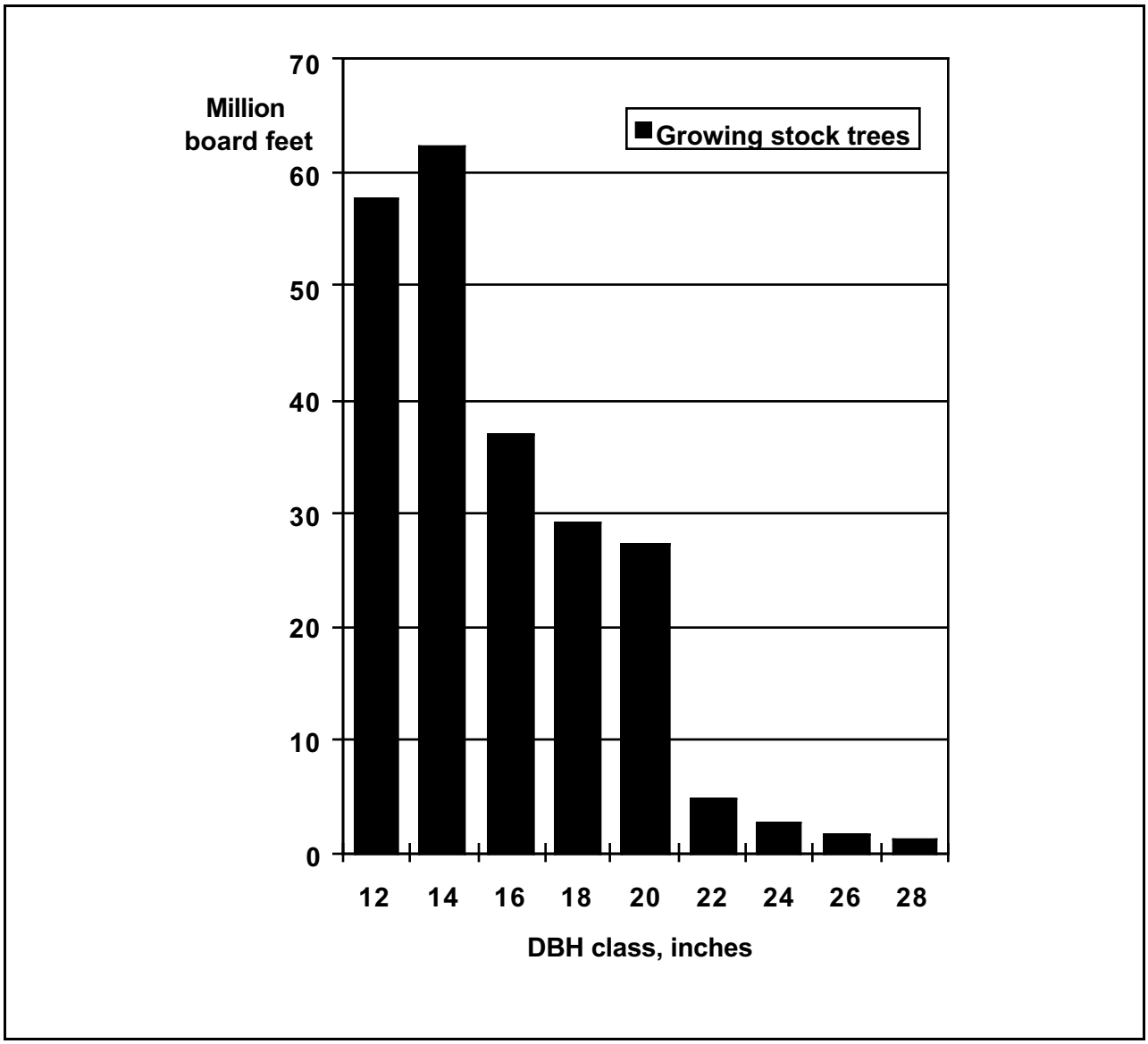

Figure 4: Estimated sawtimber volume of black walnut trees in Iowa, 1990, for sawtimber trees on timberland, by diameter class.