

# Transplanting of Sycamore Trees Grown in Fabric Bags

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**Nature of Work:** The field-grow container or root bag has been the subject of much attention and may testimonials over the past several years (1,2,3,4). The attractiveness of a convenient root harvesting system for field-grown nursery trees, such as the field-grow bag, is obvious when considering increasing labor costs, in-climate weather conditions and the decreasing availability of skilled balled in burlap (B&B) digging personnel (2,4).

A concern to a grower considering field-grow bags is timing of harvest (1). Manufactures recommend that 14 inch bags be used for 1 ½ inch caliper trees, 18 inch bags be used for 2 – 2 ½ inch caliper trees and 22 inch bags be used for 3-4 inch caliper trees. The question arises as to what does a grower do with trees in bags ready to harvest with no market? A container grower may simply shift to the next larger container, but this is not feasible for a field grower. The objective of this study was to compare root growth and transplanting success of field-grown sycamore trees, with and without 18 inch fabric bags that had a caliper for 40% in excess of manufacture's recommendations and 133% larger in caliper than AAN specifications for the root ball diameter harvested.

One-year seedling sycamore trees (*Platanus occidentalis*) were planted with or without 18 inch fabric bags in May 1987. The soil was a Leeper silty clay loam and irrigation was provided as needed. After three years in the field, during March 1990, tree height (measured from the ground to the tallest branch) and caliper (measured 6 in. from the ground) was recorded. The trees were categorized into caliper groups ( $\leq 3.5$  in. and  $> 3.5$  in.) dug and transplanted. Five bag-grown trees of each caliper group were dug and transplanted by hand and 5 trees without bags of each caliper group were dug and transplanted using a tree spade with a 36-38 inch diameter root ball. No supplemental irrigation was provided to the transplanted trees. Bag-grown trees required staking and guying. Five bag-grown trees and 5 trees without bags of each caliper group were dug with the tree spade and washed for root analysis. Survival and plant quality, 0 representing dead and 5 best qualities, were measured May 1991.

**Results and Discussion:** Height of the trees was not different between bag-grown trees and trees without bags at harvest (Table 1). Bag-grown trees had 113% more root mass than trees without bags, in spite of differences in the volume of soil excavated (Table 1 and 2). Bag-grown trees less than 3.5 inch caliper had a larger caliper compared to those grown without a bag with no difference in height; whereas, bag-grown trees greater than 3.5 inch caliper were slightly taller

than those grown without a bag with no difference in caliper (Table 2). Bag-grown trees were considerably easier to handle than the spade-dug plants simply due to the difference in soil mass. A few root escapes were noted and they occurred in regions of seams along the bottom of the container, which the manufacturers have corrected in later generations of the bag.

Bud break after transplanting was delayed nearly 4 days for the bag-grown trees compared to trees without bags ( Table 3). The spring and early summer of 1990 had adequate rainfall; therefore, supplemental irrigation was not considered. However, the remainder of the summer of 1990 was dry and the transplanted trees were subjected to considerable stress. After 14 months, more spade transplanted trees had survived than bag-grown tree (Table 3). No differences in survival due to caliper size was noted (data not shown). The quality of the spade transplanted trees that survived was higher than the bag-grown trees (Table 3). This difference in survival and plant quality most likely could have been negated by supplemental irrigation. The larger soil volume explored by the roots of the spade transplanted trees provided more soil moisture to the tree; whereas, the bag-grown root system was confined to a smaller volume, thus less available soil water.

Significance to the Industry: This study illustrates that fabric bags are a viable alternative to spade harvesting techniques, yielding a larger volume of roots in the soil ball during harvest for similar sized trees. However, due to the difference in soil volume occupied by roots, bag-grown trees may require irrigation after transplanting.

#### Literature Cited

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