

Planting 1-0 and 2-0 Containerized Longleaf Seedlings – Georgia Field Trial Results and Recommendations

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1-0 and 2-0 Longleaf Containerized Seedlings Background

Longleaf containerized (or bareroot) seedlings that are designated as 1-0 by the nursery originate as seed that is sowed in March-April and later in the year are pulled from trays as early as September for containerized seedlings or early December for bareroot seedlings. So 1-0 seedlings are grown in the nursery for one growing season 6 – 11 months (April 2017 – September 2017 to February 2018). Longleaf 2-0 seedlings are grown in the nursery for essentially two growing season; 17 – 22 months (April 2017 – September 2018 to February 2019). The 2-0 seedlings are usually bigger and weigh more than 1-0 seedlings. Photos 1 and 2 compare 1-0 to 2-0 longleaf seedlings for size. When 1-0 and 2-0 containerized seedlings are weighed, the 2-0 seedlings usually average greater than 70% more weight than the 1-0 seedlings. The 2-0 seedlings also have 20-40% greater root collar diameter than the 1-0 seedlings.



Photo 1. Longleaf containerized 2-0 seedlings on the left and 1-0 seedlings on the right.



Photo 2. Longleaf containerized 2-0 seedlings on the left and 1-0 seedlings on the right of the photo.

Outplanting 1-0 versus 2-0 Longleaf Containerized Seedling Trials–Short-term (1-7 years) Results

One site in northwestern Laurens County, Georgia (well drained Fuquay soil series) had side by side plantings of 1-0 and 2-0 longleaf containerized seedlings (Photos 3 and 4). The 1-0 longleaf trees averaged 82% survival and were 21 feet tall while the 2-0 trees averaged 91% survival and were 23 feet tall seven years after planting.

A second site on a poor, excessively well drained deep, sandy soil (Lakeland soil series) in Candler County, Georgia had 2-0 containerized longleaf seedlings planted the year before 1-0 seedlings were planted on the other side of the road. Survival was 87% and height growth averaged 2.2 feet per year for the 2-0 trees and 69% survival and 2.0 feet per year for the 1-0 longleaf trees seven years after the 2-0 seedlings were planted and six years after the 1-0 seedlings were planted (April 2013 measurements of 150 trees each).

Toombs County, Georgia was the third site (UGA Onion Farm) and had 1-0 and 2-0 seedlings planted in a replicated study (Irvington soil series). Photos 6 and 7 illustrate the height and survival of the young trees. Figure 1 shows the survival range for the 1-0 (40-70%) and the 2-0 (70-80%) seedlings after one year. Average survival was 64% for the 1-0 seedlings and 75% for the 2-0 seedlings. On the fourth site in Toombs County, Georgia (Mosely site; Dothan soil series) the 1-0 stock seedlings averaged 75% survival and the 2-0 stock averaged 87% survival (Figure 2).

A fifth site located in southwestern Laurens County, Georgia (Wagram soil series), the 1-0 stock containerized seedlings averaged 75% survival and the 2-0 averaged 94% survival one year after planting. Photo 8 illustrates the 1-0 and 2-0 seedling size difference prior to planting.



Photos 3 and 4. The photo on the left is 1-0 containerized longleaf trees that had an 82% survival rate and averaged 21 feet tall. The trees in the photo on the right are 2-0 containerized longleaf pine that had a 91% survival rate and averaged 23 feet tall at 7-years old. This site is in northwestern Laurens County, Georgia.



Photo 5. Longleaf containerized 2-0 trees on the left side of the photo and 1-0 containerized trees on the right side of the photo. The 2-0 trees on the left were planted one year earlier than the 1-0 trees on the right. Average survival was 87% with 2.2 feet annual height growth for the 2-0 trees and 69% survival and 2.0 feet annual height growth for the 1-0 longleaf trees.



Photos 6 and 7. Toombs County, Georgia (UGA Onion Farm) 1-0 versus 2-0 containerized longleaf seedlings trial. The photo on the left illustrates 1-0 trees, and the photo on the right shows 2-0 trees. Photos taken two years after planting.

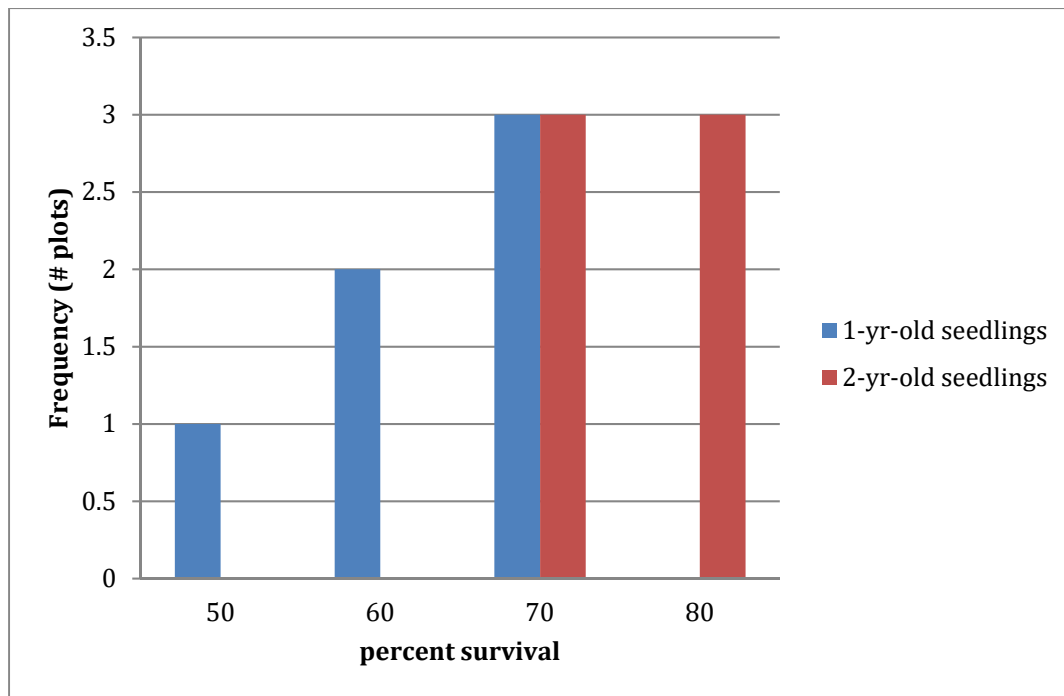


Figure 1. Toombs County, Georgia 1-0 and 2-0 stock containerized longleaf seedling survival ranges by plots (50-70% for 1-0 and 70-80% for 2-0) after one growing season. Overall survival means were 64% for the 1-0 and 75% for the 2-0 stock seedlings.

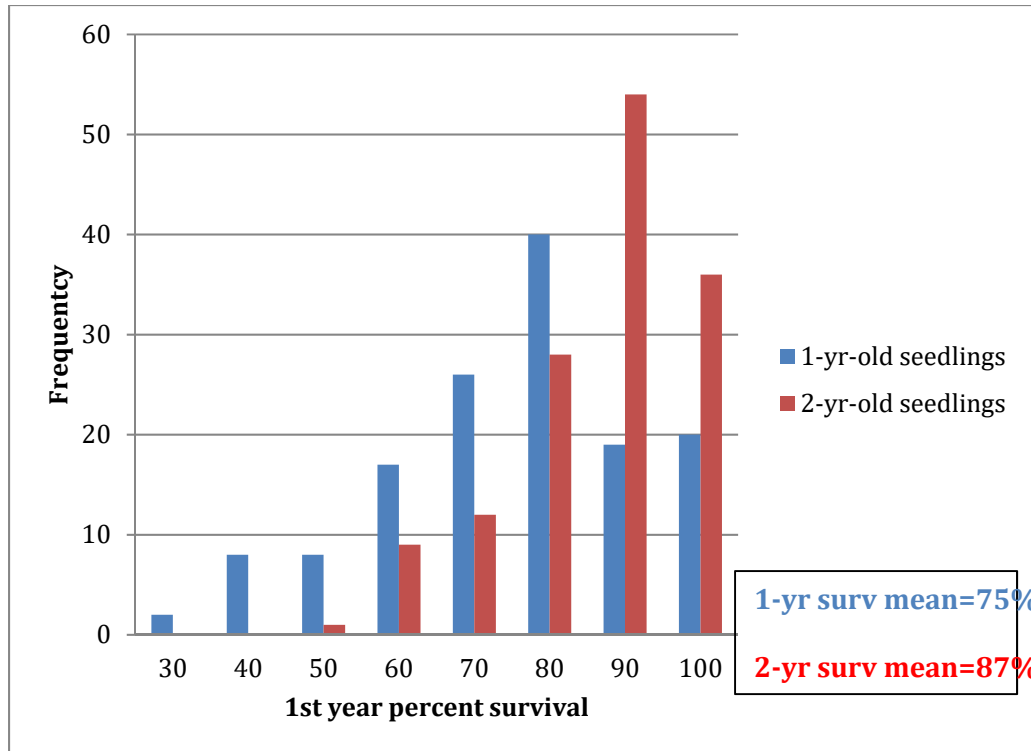


Figure 2. Toombs County, Georgia (Mosely site) first year survival range and means for the 1-0 (1-yr) and 2-0 (2-yr) containerized longleaf seedlings.

Case #5 Laurens Co side-by-side old-field planting trial:

- Hand planted 4 Jan 2013 – 5 rows 2-yr-old then 5 rows of 1-yr-olds with 3 replications (with tube dibbles on a loamy sand soil)
- 1st yr survival
- Jan 2014
- 1yr-olds=75%
- 2yr-olds=94%

Photo 8. Southwestern Laurens County, Georgia site 1-0 (right set of seedlings in photo) versus 2-0 (left set of seedlings in photo) containerized longleaf planting survival trial.

Summary

Based on these relatively short-term trials comparing 1-0 versus 2-0 containerized longleaf seedlings outplanted side-by-side; the 2-0 had a 9 (82 vs 91% survival at the northwestern Laurens County site) to 19 (75% vs 94% at the southwestern Laurens County site) percentage point gain in survival and a 0.2 to 0.3 feet/year height growth gain compared to the 1-0 seedlings for the first 5 to 7 years after planting. In some years, pine seedling nurseries have 2-0 seedlings, and in some years all the nurseries sell out of all their 1-0 seedlings and have none to grow into the second year. Proper seedling storage, handling, planting quality, timing of planting, weather (temperatures and rainfall timing, intensity and frequency) are important factors for pine survival and growth. Size differences and performance gains with older seedlings may warrant the purchase of 2-0 containerized longleaf seedlings when they are available.