



Container Production and Field Evaluation of Cold-hardy Palms in Georgia

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Nature of Work: Palms are most often associated with tropical environments, but there are several cold-hardy palm species known to tolerate winter temperatures well below freezing. Two well-known examples of cold-hardy palms are Needle Palm, *Rhapidophyllum hystrix*, a native palm species, and Windmill Palm, *Trachycarpus fortunei*. Both of these palms, when healthy, have been shown to survive winter temperatures into the single digits with little foliar damage and to recover from freezes as low as 10 degrees below zero.

This study has two objectives: The first is to evaluate the adaptability of nine palm species planted in an outdoor landscape setting in the piedmont region of Georgia (zone 7b - Athens). The second is to evaluate seed germination and to develop a recommended container production scheme for four palm species.

Three replicates of the nine palm species were planted in an open field and exposed site at the UGA Horticulture Farm in Watkinsville, GA on April 29, 2004: *Rhapidophyllum hystrix* (Needle Palm), *Sabal minor* (Dwarf Palmetto), *Sabal palmetto* (Cabbage Palm), *Sabal* 'Birmingham', *Sabal* 'Xtensensis' (Brazoria Palm) *Sabal* 'Louisiana', *Sabal uresana* (Sonoran Palmetto), and *Trachecarpus takil* (Kumaon Palm). In addition, Windmill Palm, *Trachycarpus fortunei*, grown in 3 gal., 7 gal., or 15 gal. containers, were planted in an effort to test a common theory among palm growers that larger palms have more cold hardiness. Growth measurements and cold damage assessments will be made over a five year period. Minimal winter temperatures will be recorded.

In a second study, germination percent of four palm species was assessed: *S. minor*, *S. louisiana*, *T. fortunei*, and *R. hystrix*. Next, seedlings of these four species were planted into 1-gallon containers of bark/sand mix containing dolomite lime and Polyon 19-6-12 + minors (6 mos.) fertilizer using two application techniques (top-dressed vs. incorporated) and two rates (medium and high). An additional uniform quantity of Polyon will be top-dressed on all treatments as needed during the production cycle. Growth measurements will be used to assess treatment effect. Additional production studies are planned for 2005.

Results and Discussion: Germination data are shown in Table 1.

Table 1. Germination data on four palm species.

| Palm Species | Number of Seeds | Preparation | Soil Temperature | Date of planting | Germination Date/% |
|--|-----------------|---|------------------|------------------|--|
| <i>Sabal minor</i> collected from plants at Aquinas HS, Augusta, GA | 300 | Soaked, cleaned | 85F | 2/12/04 | 3/10/04 10% |
| | | | | | 3/15/04 25% |
| | | | | | 3/18/04 60% |
| | | | | | 3/22/04 85% |
| | | | | | After 3/22 Random to 95% |
| <i>Sabal louisiana</i> collected from plants at Aquinas HS, Augusta, GA | 300 | Soaked, cleaned | 85F | 2/13/04 | 3/08/04 15% |
| | | | | | 3/12/04 20% |
| | | | | | 3/16/04 50% |
| | | | | | 3/18/04 65% |
| | | | | | After 3/18 Random to 90% |
| <i>Trachycarpus fortunei</i> collected from trees in Thomson, GA | 300 | Soaked, cleaned | 75F | 2/20/04 | 3/31/04 10% |
| | | | | | 4/05/04 20% |
| | | | | | 4/15/04 40% |
| | | | | | Seed was old and some weevils detected. |
| <i>Rhapidophyllum hystrix</i> collected from plants in Augusta, GA | 200 | Soaked, cleaned, outer coating cracked | 85F - 75F | 2/24/04 | 4/19/04 4% |
| | | | | | 5/15/04 8% |
| | | | | | 6/28/04 12.5% |
| | | | | | Seed is notoriously slow and erratic to germinate. Some weevils noticed in old seed. |

The seed germination study was conducted at Aquinas High School in a greenhouse using bottom heat. Seed were soaked in water for 24 hours. This softens the outer husk, making the seed easy to remove by hand. *Rhapidophyllum hystrix* (Needle Palm) seeds are known to have a double dormancy and require some sort of scarification in addition to soaking in water to enhance their germination. Even then, germination of this species is slow and erratic, often taking 4 to 6 months. *Sabal minor* and *Sabal* 'Louisiana' seed had 95% and 90% germination, respectively, two months after planting. *Trachycarpus fortunei* germination would normally have a 90%+ germination. However, the seed were old and some weevils got into them during storage. Ideally, palm seeds should be collected in fall and planted immediately, but this study used seed that had been stored for several months.

Since the fertility study was just initiated in October, 2004 and the field study in April, 2004, data on these studies will not be available until 2005. Additional palm species are to be planted at the Mountain Experiment Station in Blairsville in 2005, and additional fertility studies are planned at the CANR during the 2005 growing season.

Significance to the Industry: There is a growing interest in developing tropical-looking environments in temperate climates. A good example is the increased use of tropical foliage plants in seasonal color plantings. Likewise, the use of cold-hardy palms in temperate zones is projected to increase as more landscape designers and landscape contractors discover their merits and cold tolerances. Our cultivar and species evaluations and container studies should help growers develop production lines and plan appropriate production schedules.