EFFECTS OF LEAF REMOVAL ON SURVIVAL OF TRANSPLANTED SABAL PALMS

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Abstract. A large landscape installation of mature sabal palms was utilized to determine if complete leaf removal, as opposed to leaving one-third of the canopy on the palm, would improve transplant success in this species. After eight months 95% of the palms completely defoliated were alive, versus 64% for palms transplanted with leaves. The original leaves left on palms in the latter treatment all died within one to two months and required subsequent manual removal. Among the surviving palms, canopy size of defoliated palms was slightly larger than in palms with leaves.

Résumé. *Une grande surface paysager de choux* palmistes à maturité était utilisée pour déterminer si un enlèvement complet du feuillage, par opposition à des palmiers dont le tiers de la cime est laissé sur l'arbre, augmenterait le taux de succès lors de la transplantation de cette espèce. Après huit mois, 95% des palmiers complètement dèfoliés étaient vivants versus 64% pour ceux transplantés avec des feuilles. Les feuilles d'origine laissés sur les palmiers ayant subi le second traitement sont toutes mortes en l'espace de un à deux mois et requéraient un enlèvement manuel subséquent. Parmi les palmiers survivants, la dimension du couvert des palmiers défoliés était légèrement plus large que celle des palmiers avec des feuilles.

Palms are unusual among woody landscape plants in that large field-grown specimens are usually more successfully transplanted than smaller immature ones (2, 4). The survival rate of transplanted mature palms may be related to the fate of the root stubs remaining within the root ball. In most palm species examined, root survival rate is directly related to the length of the cut root stubs (1, 3). However, in sabal palm *(Sabal palmetto)* vitually no cut roots survive, regardless of length. Thus transplanted sabal palms have no functional root system for the six to eight month period required for the production of new adventitious roots from the root initiation zone at the base of the trunk (1).

Sabal palms are the most widely planted of all palms in southeastern United States. Virtually all are dug as mature specimens from natural stands since their slow growth rate makes nursery production unecomomical. Survival rates for transplanted sabal palms are often low. Observations suggest that water stress resulting from a lack of roots may be a primary factor in sabal palm transplant failure.

The standard procedure for transplanting field-grown sabal palms is to remove the lower two-thirds of the leaves and tie the remaining leaves into a tight bundle around the bud to reduce transpiration. The remaining leaves typically become desiccated and die within one to two months and the palms may appear to be dead. If the palm survives, new green leaves will eventually emerge from within the canopy of dead foliage. Since leaves left on transplanted sabal palms usually die anyway, but may contribute to the water stress problems of the palms, removal of all leaves might improve transplant survival in this species. The objective of this study was to determine the success of transplanting sabal palms with or without leaves in an actual landscape installation.

Materials and Methods

Several hundred sabal palms with trunks from three to five meters long were installed in a street median landscape in Miami, Florida in October, 1989. Approximately half were transplanted using the standard practice of removing all but the top one-third of the leaves and tying these remaining leaves up with biodegradable twine. The other half had all leaves removed prior to transplanting. All palms received soil irrigation as needed during the eight month evaluation period. Approximately 100 palms from each treatment were then evaluated for appearance and size of the new green canopy.

Results and Discussion

In this experiment, the survival rate for palms transplanted without leaves was 95%, compared to 64% for those transplanted with one-third of their leaves remaining. Canopy size ratings (0 = dead; 5 = full canopy) for defoliated palms averaged 2.3 versus 1.4 for palms with leaves if all palms are considered. However, since 36% and 5% of the palms transplanted with and without leaves, respectively died and had canopy ratings

of zero, the actual canopy size of the surviving palms is underestimated by these figures. Among the surviving palms, canopy size was slightly smaller for palms transplanted with leaves (2.1 vs. 2.4). Oyama and Mendoza (6) and Mendoza, et al. (5) have shown that manually defoliated *Chamaedorea tepijilote* and *Astrocaryum mexicanum* produced leaves at a faster rate than did intact palms. Whether this phenomenon occurred in this experiment or reduced transpiration and water stress are responsible for the results obtained here is not known. Both factors may be involved. In addition to the lower survival rate for palms transplanted with leaves, the fact that all the original leaves died and had to be removed manually later makes this practice costly in terms of labor requirements.

The results of this study are consistent with verbal reports from other landscapers in Florida who have done similar experiments with similar results. Complete leaf removal appears to be the best method for transplanting sabal palms, which lose all their roots in the transplant operation. However, this procedure may not be optimal for other palm species in which at least some roots survive the transplant process. Desiccation of leaves left on other species of transplanted palms is not usually as severe as in sabal palms. Recovery in these species may be impaired by complete removal of the canopy if water stress is not the primary limiting factor. Further research on other species is needed to determine the optimal transplanting methods for each species.

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ABSTRACT

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During the autumn of 1982, Morris Arboretum staff implemented a program to conserve its fine collection of trees. The goal is to keep the trees healthy. Strategies for tree health include fertilizing, watering, soil aeration, mulching and avoiding construction injuries and soil compaction. A key to our program is a priority plan. The first category includes our 10 best specimen trees as determined by the staff. These trees receive frequent inspections. Trees in the second category are distinguished by such traits as rarity, size, age, landscape importance, educational merit and research usefulness. The third category is a general list including trees noted for their landscape importance and longterm collection policy relevance. The fourth priority maintenance category includes collection culls. The tree conservation program has resulted in exemplary tree care for the most highly prized specimens.