

We are unable to supply this entire article because the publisher requires payment of a copyright fee. You may be able to obtain a copy from your local library, or from various commercial document delivery services.

From Forest Nursery Notes Winter 2013

**239. © Resprouting ability of dry forest tree species after disturbance does not relate to propagation possibility by stem and root cuttings.** Vieira, D. L. M., Coutinho, A. G., and da Rocha, G. P. E. Restoration Ecology online. 2012.

SET-BACKS AND SURPRISES

# Resprouting Ability of Dry Forest Tree Species after Disturbance Does Not Relate to Propagation Possibility by Stem and Root Cuttings

Daniel L. M. Vieira,<sup>1,2</sup> André G. Coutinho,<sup>1,3</sup> and Gustavo P. E. da Rocha<sup>1</sup>

## Abstract

Tropical dry forest tree species are recognized for their high resprouting ability after disturbance. We tested whether species that commonly produce root and stem suckers can be propagated by large stem and root cuttings, a useful method for landscape restoration programs. We performed four experiments: (1) In a greenhouse, we tested the propagation of six species using large stem cuttings collected from early successional sites. We used the following treatments: (i) dry season collection and planting; (ii) dry season collection, storage in humid soil, and wet season planting; (iii) wet season collection and planting; and (iv) wet season collection and planting after treatment with commercial NAA auxin. (2) Stem cuttings of *Myracrodruon urundeuva* were planted in a pasture during the rainy season after either NAA, IBA, or no auxin treatment. (3) As a control experiment, we also planted

cuttings of *Spondias mombin*, a species known for successfully regenerating from cuttings. (4) Root cuttings of six species were collected in recently plowed pastures and planted in the greenhouse with and without treatment with NAA auxin. No root cuttings rooted. Only *M. urundeuva* and *Astronium fraxinifolium* stem cuttings rooted. Maximum success was obtained for stem cuttings collected and planted in the dry season (23%). Only 13% of *M. urundeuva* had sprouted by the 15th month of the field experiment. As a result, large cuttings are not recommended for propagation of the studied species. Future studies should include development of suitable methods of root harvesting and prospection of traditional knowledge for species selection.

**Key words:** live fence, seasonally deciduous tropical forests, stakes, vegetative propagation.

## Introduction

Growing trees by using large stem and root cuttings is a common technique, used around the world to propagate fruit trees while maintaining desirable genotypes and enabling precocious fruit production (Hartmann & Kester 1975). This technique is also used to quickly establish live fences (Budowski & Russo 1993; Choudhury et al. 2005). However, the use of large cuttings has been mostly neglected in restoration ecology (de la Cerda 1999; Zahawi 2005), despite clear advantages over nursery seedlings: (1) started plants can be larger, overcoming the herbaceous layer and cattle herbivory; (2) plants have higher growth rates and earlier reproduction, which modifies the habitat structure and attracts animals more quickly; and (iii) costs are lower, because cuttings do not require a nursery stage (Zahawi 2005; Zahawi & Holl 2009).

Two factors explain the rarity of tree propagation by cuttings in ecological restoration and silvopastoral and agroforestry systems. First, there is little knowledge of successful techniques and candidate species. While in Central America live fencing is a common practice among farmers, in Brazil this practice is incipient (Miranda & Valentim 1998; Nascimento et al. 2009), and there is little information about the local native species and proper techniques for propagation by large cuttings. Second, propagation by cuttings causes undesired genetic homogeneity, because many cuttings are taken from a few trees. This is a cause for concern because genetic diversity of populations is one of the goals of ecological restoration.

This study investigates the potential of root and stem cuttings for tree propagation of dry forest species of central Brazil. Tropical dry forests are known for the abundance of tree species with high resprouting ability after disturbances such as fire or plowing (Vieira et al. 2006; Sampaio et al. 2007; Mostacedo et al. 2009). High resprouting ability of established trees suggests good potential for rooting of cuttings, although these two traits may not be strongly correlated (Itoh et al. 2002). Finding successful species and techniques for the vegetative propagation of native plants would contribute greatly to the increase of vegetation cover in tropical dry forests, by

<sup>1</sup>Laboratório de Ecologia e Conservação, Embrapa Recursos Genéticos e Biotecnologia, Brasília, DF 70770-917, Brazil

<sup>2</sup>Address correspondence to D. L. M. Vieira, email daniel.vieira@embrapa.br

<sup>3</sup>Graduação em Biologia, Universidade de Brasília (UnB), Brasília, DF 70919-970, Brazil