PLANT SPECIES FOR USE IN BIOENGINEERING IN DEGRADED AREAS: ASSESSMENT OF THE SEEDS CHARACTERISTICS FOR APPLICATION IN BIODEGRADABLE GEOTEXTILE

Fábio Soares dos Santos

Andréa Rodrigues Marques; Fernanda Gallotti Costa

1 - Universidade Federal de Minas Gerais - UFMG, Av. Antônio Carlos 6627, Pampulha, 31270901, Belo Horizonte, MG. fabiosoares04@gmail.com

2 - Departamento de Engenharia Ambiental, Centro Federal de Educação Tecnológica de Minas Gerais - CEFET - MG, Av. Amazonas 5253, Nova Suíça, 30421169, Belo Horizonte, MG. andrearmg@gmail.com

INTRODUÇÃO

Currently, among environmental concerns, the most prominent one is the degraded ecosystems restoration. The removal of the vegetation covering through human action makes some forest systems susceptible to erosion, and causes sedimentation of the watercourses and biodiversity loss. Natural regeneration of a tropical forest, especially the Brazilian Cerrado, is often slow and uncertain because of a combination of several factors, such as aggressiveness and dominance of invasive grass, fires recurrence, unfavorable microclimate conditions, low soil fertility and depletion of the seed bank (Parrotta *et al.,* ., 1997). In this context, bioengineering works offer some ecologically correct biological techniques. The biodegradable geotextile made of coir covered with a photo - degradable polypropylene mesh associated with sediment retainers is an available instrument in the control of bank erosion, and a promising bioengineering technique (Gomes *et al.,* ., 2005). The use of this technique favors the degraded vegetation restoration, because it prevents the sun to radiate directly on the soil, protecting surface from erosion, and also reduces evaporation and superficial water flow, promotes water infiltration and act as mulch where the seeds germination occurs (Galas, 2005). The application of degradable geotextiles together with the use of native species in different successive stages may have an important role in the degraded forests recuperation.

OBJETIVOS

The aim of this study was to select plant species, native to southeastern Brazil, which are suitable for the manufacture of biodegradable geotextile fertile (coir mesh with seeds), considering the ecological profile of the species as well as the characteristics of their seeds (seed size, seed pre - treatment, emergence time and seed storage capacity).

MATERIAL E MÉTODOS

For the selection of native species, specialized books were used (Lorenzi, 2002a,b; Lorenzi, 2008; Pereira, 2006), in order to use appropriate classification according to the following criteria: 1) successional stage, 2) terrain type of the occurrence, and 3) tolerance to the sun. Among the selected species, for the preparation of the mixed - seed to be employed on biodegradable geotextile the following factors were considered: 1) seed size, 2) absence of the seed pre - treatment, and 3) seed emergence time.

RESULTADOS

From the plant species that were studied, the ones that showed seeds with characteristics compatible for preparation of the biodegradable geotextile fertile were four leguminous herbaceous (*Arachis pintoii*, *Calopo-*

gonio mucunoides, *Canavalia ensiformes* and *Centrosema pubescens*), and 126 tree species, especially *Allophylus edulis*, *Astronium fraxinifolium*, *Dendropanax cuneatus*, *Eugenia dysenterica*, *Inga cylindrica*, *Magonia pubescens*, *Protium hepthaphylum*, *Protium spruceanum*, *Xylopia ermaginata*, among others, have potential for silviculture (economic, ecological and social value) and/or to attract disperser fauna. Among the selected species, 77 were pioneers, 34 secondary and 15 climax seral stages. Six groups of the mixed - seeds were made, each containing seven species, three of which are pioneers, two are secondary and two are climax. This diversity of successional stages is an attempt to replicate natural processes, which has great importance in the process of degraded areas regeneration, contributing to the increasing species heterogeneity in the restored system. Each two of these mixes are for dry and rocky terrain and/or rarely flooded (C1), flooded (C2) and periodically flooded (C3). Among the 14 species listed for C1, 7 seeds are orthodox and one is recalcitrant, for the C2, 7 are orthodox and for C3, 7 are orthodox and two are intermediate.An example is the mix made for C1, with the species *Astronium fraxinifolium*, *Platypodium elegans* and*Stryphnodendron polyphyllum* (pioneers), *Maprounea guianensis*and*Machaerium brasiliense* (secondary) and *Alseis floribunda* and*Pterodon polygalaeflorus* (climax). The selection of number and species type, when correctly performed, determines the environmental protection success and reduces costs. Furthermore, the incorrect utilization of the exotic, weed and invasive species in degraded areas can cause problems such as their interference on agriculture, on livestock farming, on health as well as on man's life (Lorenzi, 2008), besides affecting the ecosystems biodiversity in the conserved areas (Ziller, 2001). The choice of the native species seeds for use in biodegradable geotextiles fertile reconciles the environment physical conditions where the seedling will be growing, the seed storage capacity, which involves the fact that they are orthodox, recalcitrant or intermediate, and that there is no need of pre - germination treatment. This is important because, these seeds should remain viable during their storage in geotextile, and when they are cultivated, germinate under natural environmental conditions. This diversity of the successional stages is an attempt to copy natural processes, which is very important in the process of the degraded areas regeneration.

CONCLUSÃO

The use of the biodegradable geotextile fertile with native seeds combines the technique of direct seeding with the containment of erosion, and it increases the chances of successful regeneration of the degraded area. This technique can be an eco - friendly alternative, because it avoids the use of exotic and invasive species, besides having low cost if the geotextiles are fertilized according to the location in which one wishes to install them.
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