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By Dexter B. Dombro

Reforestation and afforestation often involves planting trees that have a proven history of commercial success, fast growth and ease of cultivation. This copies the same pattern that has seen biodiversity in crops decline around the world, as most agriculture revolves around a limited number of species. At La Pedregoza one of our objectives is to practice multispecies cultivation that includes native trees. The importance of this is obvious when one visits large teak plantations in Costa Rica, as they are usually devoid of insects, birds and local wildlife, because teak is a tree from south Asia that is not part of local niche habitats.

Bertoldo looking for Sassafras trees in the dry season.

Endangered *Ocotea cymbarum* tree. How do we get up there?

At La Pedregoza we rapidly focused in on the vast variety of native tree species to be found in the Orinoco River basin of Vichada, Colombia. Many of these trees have exotic qualities, be that wood, termite resistance, fruits, nuts, oils, resins or natural medicines. We soon discovered that some native trees appear to be fast growing, but that there is virtually no data available on seed germination, propagation, planting methods or best cultivation practices. During this process we learned that many species of native trees are listed in the red books of the *International Union for the Conservation of Nature* (IUCN) as endangered, vulnerable or threatened.

Our *Amazonia Reforestation* and *CO2 Tropical Trees* programs at La Pedregoza are based on a desire to preserve biodiversity on our planet. Some 90% of terrestrial biodiversity lives in forests. Many of those animals are niche dependent, for example everyone learns in school about Koala bears needing eucalyptus trees and giant Pandas depending on bamboo forests. At La Pedregoza we have birds, amphibians and mammals that depend on certain types of native trees for food, shelter and nesting areas. Planting native tree species soon became not just an objective for our reforestation efforts and for our *Reserva Natural La Pedregoza*, but a passion.

Young Congrio trees in experimental plot with well-drained soil.

Bertoldo climbing way up in a Salivón tree at La Pedregoza

Due to our wet and dry seasons we are able to collect most of our native tree seeds in the second half of the dry season and the early part of the wet season. Most trees flower in the first half of the dry season, so the best time for us to collect most native tree seeds is predictable. This does not mean it is an easy process. Monkeys, macaws, parrots and ants compete with us for the fruits and seeds of several trees that are on the endangered list. Once the rains start we experience flooding in the rainforest, with seeds falling into the water and washing away. Climbing the trees can be dangerous, as many seeds can only be found high in the rainforest canopy. This makes the seed collection process expensive, time consuming and often disappointing when seeds have already been lost.

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Endangered *Ocotea cymbarum* seeds.

This March and April of 2012 our foreman, *Bertoldo Aldana*, our plantation administrator, *Oscar Forero Azabache*, and I were able to collect native trees seeds from a variety of species. Some of what we collected includes 3000 Congrio seeds (*Acosmium nitens*), 1100 endangered Sassafras seeds (*Ocotea cymbarum*), 6000 Saladillo blanco (*Vochysia obscura*), 1200 latex producing Pendare or Salivón seeds (*Parahancornia oblonga*), 800 threatened latex producing Madroño seeds (*Rheedia madrunno*), and several hundred Moriche palm seeds (*Mauritia flexuosa*) to plant for use by local indigenous artisans.

Once the seeds are collected various things happen. First off we maintain a photographic record of the seeds and their appearance for future reference. Next we do various experimental germination trays, so see what works best (direct in soil, soaked for 24 or 48 hours, fired to crack seed cover, rubbing sand paper on germination end of seed etc.). This data is of course recorded. Once the seeds sprout we transfer them to planting bags containing soil that has been treated for bacteria and fungi. Usually larger than normal planting bags are used, because we do not fully understand the type of early root system these native trees produce, so that is something we monitor. The seedlings are then placed in the tree nursery where we observe their early growth. This is usually an indication of root development as well, which in turn lets us determine how soon the seedling can be transferred to the open field. While in the nursery the seedlings are provided with some shade, but we try to remove the shade once growth starts, so that the little trees can better withstand the conditions they will encounter once planted in the field.

Extracting the seeds of the latex producing Salivón or Pendare tree (*Parahancornia oblonga*) is not easy, as the monkeys often beat us to the sickly sweet and orange-sized fruits that contain the seeds. The fruits are edible by humans, but are almost impossible to collect high up in the rainforest canopy. They start to ferment before they fall to the ground.

Saladillo blanco (*Vochysia obscura*) seeds sprouting in a germination table at La Pedregoza's tree nursery.

Native trees pose special problems for us at La Pedregoza, because in Vichada's Orinoco River basin many of these trees are adapted to inundation forest and low lying area conditions. That means they may require annual flooding. It is hard to do soil preparation in low lying areas, as the soil may be very wet and soft, making mechanical soil preparation difficult. It also affects how we apply lime to balance soil pH, fertilizer and organic material, as flooding may wash those substances away before the tree can make use of them. Part of what we do is to plant native trees in both low lying areas, and in areas with better drainage. For example, even though Congrio (*Acosmium nitens*) typically grows in the inundation forest, we have experienced better growth results with this species in less humid areas, than in low-lying inundation areas. Once again all of this data is collected and tracked.

Our long term goal to become a seed bank for native tree species is shared with the *Omacha Foundation* and with Europe's *Tree-Nation*. Our common goal is to conserve species that are endangered, vulnerable or threatened. It is our believe that if we can commercialize those species, by providing access to seeds, germination and planting instructions and information on growth expectations and carbon sequestration, then other plantations will start to cultivate these species. That will reduce or remove the pressure those species experience in natural forests, reduce illegal logging and allow for the species to recover over time. Commercializing a species may appear to some to be an unwelcome development, but it is a process that is most likely to prevent a species' extinction and to have an impact on maintaining and conserving biodiversity.

Saladillo blanco (*Vochysia obscura*) seedlings in planting bags at the La Pedregoza tree nursery in Vichada, Colombia.

Congrio (*Acosmium nitens*) seed pods ready to be collected at La Pedregoza.

Once removed from their seed pods, Congrio or *Acosmium nitens* seeds are not much bigger than apple seeds, but require soaking for 24 hours to germinate.

Dexter B. Dombro is one of the founders of Amazonia Reforestation, CO2 Tropical Trees and of the Reserva Natural La Pedregoza in Vichada, Colombia. La Pedregoza is one of the featured plantations within Tree-Nation. Dexter is a member of the IUCN's World Commission on Protected Areas and is dedicated to biodiversity conservation in the Orinoco River basin. The plantation was founded in 2007.

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