INTRODUCTION

AGROFORESTRY DEFINED

In simplest language, agroforestry is the production of trees and of non-tree crops or animals on the same piece of land. The crops can be grown together at the same time, can be grown in rotation, or can even be grown in separate plots when materials from one are used to benefit another. However, this simple definition fails to take into account the integrated concepts associated with agroforestry that make this system of land management possibly the most self-sustaining and ecologically sound of any agricultural system. Thus, a second definition of agroforestry would be the integration of trees, plants, and animals in conservative, long-term, productive systems.

Agroforestry can be considered more as an approach than as a single, finished technology. Although several finished systems have been devised and tested, such technology may require adjustment for particular situations. The flexibility of the agroforestry approach is one of its advantages.
WHY AGROFORESTRY?

Agroforestry systems make maximum use of the land. Every part of the land is considered suitable for useful plants. Emphasis is placed on perennial, multiple purpose crops that are planted once and yield benefits over a long period of time. Such benefits include construction materials, food for humans and animals, fuels, fibers, and shade. Trees in agroforestry systems also have important uses such as holding the soil against erosion and improving soil fertility (by fixing nitrogen or bringing minerals from deep in the soil and depositing them by leaf-fall).

Furthermore, well-designed systems of agroforestry maximize beneficial interactions of the crop plants while minimizing unfavorable interactions. The most common interaction is competition, which may be for light, water, or soil nutrients. Competition invariably reduces the growth and yield of any crop. Yet competition occurs in monoculture as well, and this need not be more deleterious in agroforestry than monoculture systems. Interactions between components of an agroforestry system are often complementary. In a system with trees and pasture, with foraging animals, the trees provide shade and/or forage while the animals provide manure.

Thus, agroforestry systems limit the risks and increase sustainability of both small- and large-scale agriculture. Agroforestry systems may be thought of as principle parts of the farm system itself, which contains many other sub-systems that together define a way of life.

DEFINITIONS

Alley Cropping: Growing annual crops between rows of trees or shrubs.
Beautification: Planting trees for ornamental purposes.
Boundary Plantings: Trees planted along boundaries or property lines to mark them well.
Dispersed Trees: Trees planted alone or in small numbers on pastures or otherwise treeless areas.
Earthworks: Constructions made of earth, usually to conserve or control water.
Improved Fallows: Areas left to grow up in selected trees in trees-crop rotation systems.
Individual Trees: Trees occurring alone, whether spontaneously emerging or planted.
Living Fences: Fences in which the posts are living trees, or in which the entire fence consists of closely-spaced trees or shrubs.
Nectar Crop: Trees valuable as a source of nectar for honey bees.
Terraces: Level areas constructed along the contours of hills, often but not necessarily planted with trees.
Vegetative Strips: Long, narrow areas of any type of vegetation, usually planted along contours for erosion control; may include trees.
Woodlot: An area planted to trees for fuel, or timber.

SUMMARY OF BENEFITS OF AGROFORESTRY

- Improved year-round production of food and of useful and salable products.
- Improved year-round use of labor and resources.
- Protection and improvement of soil (especially when legumes are included) and water sources.
• Increased efficiency in use of land.
• Short-term food production offsetting cost of establishment of trees.
• Furnishing of shade for vegetable or other crops that require or tolerate it.
• Medium and long-term production of fruits.
• Long-term production of fuel and timber.
• Increase of total production to eat or to sell.  

**COMPONENTS OF AN AGROFORESTRY SYSTEM**

**Land**

Agroforestry is not a system of pots on a balcony or in a greenhouse. It is a system by which land is managed for the benefit of the landowner, environment and long-term welfare of society. While appropriate for all landholdings, this is especially important in the case of hillside farming where agriculture may lead to rapid loss of soil. If the farmer owns the land, s/he has a vested interest in thinking conservatively, how the land can be maintained over long periods of time. Unfortunately, farmers who rent land may have less interest in the long-term benefits of agroforestry and may even fear that making improvements will raise the rent or result in the lease being terminated.

**Trees**

In agroforestry, particular attention is placed on multiple purpose trees or perennial shrubs. The most important of these trees are the legumes because of their ability to fix nitrogen and thus make it available to other plants. The roles of trees on the small farm may include the following:

- Sources of fruits, nuts, edible leaves, and other food.
- Sources of construction material, posts, lumber, branches for use as wattle (a fabrication of poles interwoven with slender branches etc.) and thatching.
- Sources of non-edible materials including sap, resins, tannins, insecticides, and medicinal compounds.
- Sources of fuel.
- Beautification.
- Shade.
- Soil conservation, especially on hillsides.
- Improvement of soil fertility.

In order to plan for the use of trees in agroforestry systems, considerable knowledge of their properties is necessary. Desirable information for each species includes its benefits, adaptability to local conditions (climate, soil, and stresses), the size and form of the canopy and root system, and suitability for various agroforestry practices. Some of the most common uses of trees in agroforestry systems are:

- Individual trees in home gardens, around houses, paths, and public places.
- Dispersed trees in cropland and pastures.
- Rows of trees with crops between (alley cropping).
- Strips of vegetation along contours or waterways.
- Living fences and borderlines, boundaries.
- Windbreaks.
• Improved fallows.
• Terraces on hills.
• Small earthworks.
• Erosion control on hillsides, gullies, channels.
• Woodlots for the production of fuel and timber.

Some very good food-bearing trees for agroforestry are given in Table 1. Table 2 lists some of the best of the non-food producing trees used in agroforestry. Some successful uses of trees in isolation are given in Table 3. Note that any tree can be used; however, in actual practice, very large trees are not key components of most agroforestry systems.

**Non-trees**

Any crop plant can be used in agroforestry systems. The choice of crop plants in designing such systems should be based on those crops already produced in a particular region either for marketing, feeding animals, or for home consumption, or that have great promise for production in the region. In keeping with the philosophy of agroforestry, however, other values to be considered in crop selection include proper nutrition, self-sufficiency and soil protection. Thus, selection of crops requires a judgment based on knowledge of the crops, adaptations, production uses, as well as family needs, opportunities for barter, and markets.

Any farm animal can be used in agroforestry systems. The choice of animal will be based on the value the farmer places on animal-derived benefits including income, food, labor, non-food products, use of crop residues, and manure. Some examples of the use of trees, crops, and animals together are given in Table 4.

| Table 1. TREES OR LARGE SHRUBS WITH EDIBLE PRODUCTS FOR AGROFORESTRY SYSTEMS |
|------------------|------------------|-----------------|------------------|
| **Species**      | **Common Name**  | **Edibility**   | **Principle Uses** |
| Anacardium occidentale | Cashew           | flowers, seeds, fruit | garden, fence, pasture |
| Annona muricata   | Soursop          | flowers, fruit    | garden, fence, pasture |
| Borassus aethiopum| Borassus palm    | multiple food uses| garden, pasture    |
| Cajanus cajan     | Pigeon Pea       | seed, leaves      | hills, nitrogen fixation, fuel, hedgerows |
| Carica papaya     | Papaya           | flowers, fruit    | garden, quick shade |
| Cnidoscolus aconitifolius | Chaya         | leaves           | rapid hedge       |
| Cocos nucifera    | Coconut          | multiple food uses| pasture, roadside, construction |
| Coffea arabica    | Coffee           | seeds (bean)      | hedges, hills, fuel |
| Gliricidia sepium | Mother of Cacao  | flowers          | living fence, feed, fuel |
| Leucaena leucocephala | Leucaena, Ipil Ipil | leaves, young pods | hills, alley cropping, nitrogen fixation, fuel |
| Manihot esculenta | Cassava          | roots, leaves     | rapid hedge       |
| Moringa oleifera  | Moringa, Drumstick | leaves, flowers, pods | fence, garden |
| Psidium guajava   | Guava            | flowers, fruit    | pasture, fuel     |
| Sauropus androgynus| Katuk            | leaves           | hedge, alley cropping |
| Theobroma cacao   | Cacao            | pulp, seeds      | understory tree, pasture |
| Yucca guatemalensis| Izote            | flowers          | hedge             |
| Ziziphus mauritiana| Jujube           | flowers, fruit    | erosion control, fuel |
Table 2. **PRINCIPLE TREES FOR AGROFORESTRY SYSTEMS** (especially for hillsides)

<table>
<thead>
<tr>
<th>Species</th>
<th>Common Name</th>
<th>Principal Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bursera simaruba</td>
<td>Gumbo limbo</td>
<td>living fences, fuel, forage</td>
</tr>
<tr>
<td>Calliandra calothyrsus</td>
<td>Calliandra</td>
<td>vegetation strips, fallows, windbreaks, fuel</td>
</tr>
<tr>
<td>Erythrina berteroana</td>
<td>Pito</td>
<td>living fences, forage, rapid cover, nitrogen fixing</td>
</tr>
<tr>
<td>Faidherbia albida</td>
<td>Apple-ring acacia</td>
<td>terraces, dispersed trees, forage, nitrogen fixing</td>
</tr>
<tr>
<td>Gliricidia sepium</td>
<td>Mother of Cacao</td>
<td>living fences, forage, fuel, hardwood</td>
</tr>
<tr>
<td>Leucaena leucocephala</td>
<td>Leucaena, Ipil Ipil</td>
<td>alley cropping, soil conservation, food, nitrogen fixing, fuel, forage</td>
</tr>
<tr>
<td>Moringa oleifera</td>
<td>Moringa, Drumstick</td>
<td>living fences, rapid cover</td>
</tr>
<tr>
<td>Senna siamea</td>
<td>Siamese senna</td>
<td>terraces, fuel, nitrogen fixing</td>
</tr>
<tr>
<td>Sesbania grandiflora</td>
<td>Agati</td>
<td>rapid cover, forage, nitrogen fixing</td>
</tr>
<tr>
<td>Sesbania sesban</td>
<td></td>
<td>planting stakes, quick cover, nitrogen fixing</td>
</tr>
</tbody>
</table>

Table 3. **EXAMPLES OF SUCCESSFUL USES OF TREES ON SMALL FARMS** (not necessarily with other crops)

<table>
<thead>
<tr>
<th>Location</th>
<th>System</th>
<th>Tree Crop</th>
<th>Benefits</th>
<th>Other Plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central America</td>
<td>Living fence</td>
<td>Erythrina, Yuca, Gliricidia</td>
<td>food, feed</td>
<td></td>
</tr>
<tr>
<td>Tropics</td>
<td>Windbreaks</td>
<td>Casuarina</td>
<td>fuel</td>
<td></td>
</tr>
<tr>
<td>Central Africa</td>
<td>Dispersed trees</td>
<td>Faidherbia albida</td>
<td>fuel, feed, erosion control</td>
<td></td>
</tr>
<tr>
<td>Niger</td>
<td>Improved fallows</td>
<td>Leucaena, Sesbania</td>
<td>soil fertility restoration</td>
<td>grasses</td>
</tr>
<tr>
<td>India</td>
<td>Earthworks</td>
<td>Dalbergia, Pongamia, Prosopis,</td>
<td>food, soil conservation</td>
<td>gasses (napier, mando)</td>
</tr>
<tr>
<td>Tropical Africa</td>
<td>Gully Protection</td>
<td>Tamarix</td>
<td>food, soil conservation</td>
<td>grasses</td>
</tr>
</tbody>
</table>

Table 4. **EXAMPLES OF SUCCESSFUL AGROFORESTRY SYSTEMS OF TREES AND CROPS.**

<table>
<thead>
<tr>
<th>Location</th>
<th>System</th>
<th>Tree Crop</th>
<th>Benefits</th>
<th>Understory Crops</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costa Rica</td>
<td>dispersed trees</td>
<td>Cordia alliodora</td>
<td>lumber, shade, nutrients</td>
<td>coffee</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>dispersed trees</td>
<td>Erythrina spp.</td>
<td>nitrogen, fuel, shade, nutrients</td>
<td>coffee</td>
</tr>
<tr>
<td>Puerto Rico</td>
<td>dispersed trees</td>
<td>Inga spp.</td>
<td>shade, nitrogen, fuel, wood</td>
<td>coffee, bananas, root crops</td>
</tr>
<tr>
<td>El Salvador</td>
<td>dispersed trees</td>
<td>Inga spp.</td>
<td>fuel, nitrogen, shade</td>
<td>coffee, cacao</td>
</tr>
<tr>
<td>Central America</td>
<td>dispersed trees</td>
<td>leguminous trees</td>
<td>lumber, fuel, shade, nitrogen</td>
<td>grains, pasture</td>
</tr>
<tr>
<td>Malaysia</td>
<td>dispersed trees</td>
<td>dwarf coconut</td>
<td>food, lumber</td>
<td></td>
</tr>
<tr>
<td>Tropics</td>
<td>dispersed trees</td>
<td>Coconut</td>
<td>food, feed</td>
<td>pasture</td>
</tr>
<tr>
<td>Mexico</td>
<td>dispersed trees</td>
<td>Brosimum spp.</td>
<td>food, lumber</td>
<td>many crops, pasture</td>
</tr>
<tr>
<td>Haiti</td>
<td>home garden</td>
<td>Mango</td>
<td>fruit</td>
<td>rice</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>mixed perennials</td>
<td>various fruit trees</td>
<td>fruit, other products</td>
<td>spices, vegetables</td>
</tr>
<tr>
<td>Philippines</td>
<td>home garden</td>
<td>various fruit trees</td>
<td>fruits, edible leaves</td>
<td>many vegetables</td>
</tr>
<tr>
<td>West Africa</td>
<td>home garden</td>
<td>fruit trees</td>
<td>fruits</td>
<td>vegetables</td>
</tr>
<tr>
<td>Ivory Coast</td>
<td>mixed perennials</td>
<td>cacao, bananas</td>
<td>food</td>
<td>yams</td>
</tr>
<tr>
<td>Puerto Rico</td>
<td>mixed perennials</td>
<td>oranges, avocados, bananas</td>
<td>food, nutrients</td>
<td>coffee, root crops</td>
</tr>
<tr>
<td>Tropics</td>
<td>alley crop</td>
<td>Leucaena leucocephala</td>
<td>erosion control, fuel, nitrogen, nutrients</td>
<td>annuals, grasses</td>
</tr>
<tr>
<td>Nigeria</td>
<td>alley crop</td>
<td>Gliricidia sepium</td>
<td>erosion control, fuel, nitrogen, nutrients</td>
<td>root crops, grains</td>
</tr>
<tr>
<td>Rwanda</td>
<td>vegetative strips</td>
<td>Grevillea, Albizia, and Leucaena spp.</td>
<td>timber, fuel, forage</td>
<td></td>
</tr>
</tbody>
</table>
GETTING STARTED WITH AGROFORESTRY SYSTEMS

Steps in the decision-making process:

1. Decide whether agroforestry systems are appropriate:
   - Describe family and community needs.
   - List the needs that could be met with an agroforestry system.
   - List the potential benefits, and their relative importance, of an agroforestry system in the region in question.
   - Find the limiting constraints in agriculture, including markets and marketing.
   - Consider whether the people of the region are willing or capable of adopting a system.
   - Then decide if it is worth the effort to develop one.

2. Design a system:
   - Select the area.
   - Characterize its strengths and weaknesses with respect to existing soil, water, and crops.
   - Select the trees, shrubs, or grasses to be used (see Tables 5-7; consider similar local plants).
   - Characterize the minimum space requirements, water and fertilizer needs, and shade tolerance of the desired crops.

Further decisions as influenced by anticipated duration of the system

3. If the system is temporary:
   - Plan the features of soil erosion control, earthworks, and gully maintenance first.
   - Plan spacing of fruit trees according to final spacing requirements.
   - Plan a succession of annual or short-lived perennials, selecting the most shade tolerant crops for the final years of intercropping.

4. If the system is permanent:
   - Plan the proportion of the permanent fruit and lumber trees on the basis of relative importance to the farmer.
   - Plan the spacing of long-term trees on the basis of final space requirements times 0.5.
   - Plan succession of annual and perennial understory crops, including crops for soil protection and enrichment.
   - As large permanent trees grow, adjust planting plan to place shade tolerant crops in most shady areas.

5. With both temporary and permanent systems:
   - Always keep the ground covered, using various crops to protect soil from sun and erosion.
   - Try the system on a small scale first.
   - Measure the inputs and outputs of the system.
   - Evaluate whether the benefits expected have been achieved.
   - Expand or extend any new system cautiously.

SEED AND INFORMATION SOURCES FOR AGROFORESTRY SPECIES

ECHO provides sample (not bulk) packets of seeds of most of the agroforestry species listed in this publication. See our online (www.echotech.org) overseas catalog. Seed requests can also be emailed (echo@echonet.org) or mailed (17391 Durrance Road, N. Ft. Myers, FL 33917). Other seed sources are listed in Table 5 below. Be aware that many trees that are able to survive under difficult conditions may also have considerable potential to become weeds. Management can be critical. For example, pruning minimizes the ability of Leucaena spp. to produce seeds.
<table>
<thead>
<tr>
<th>Seed Supplier</th>
<th>Mailing Address/Telephone</th>
<th>Website URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australian Tree Seed Centre</td>
<td>CSIRO Division of Forestry and Forest Products, PO Box E4008 Kingston, Canberra ACT 2604, Australia</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Phone: +61 6281 8211, Fax: +61 6281 8266, Email: <a href="mailto:ffp-atsc@csiro.au">ffp-atsc@csiro.au</a></td>
<td><a href="http://www.ffp.csiro.au/tigr/atscmain/index.htm">http://www.ffp.csiro.au/tigr/atscmain/index.htm</a></td>
</tr>
<tr>
<td>Directory of Tree Seed Suppliers in Indonesia</td>
<td>ICRAf, the World Agroforestry Centre Trees and Market Unit, Jl. Cifor Situ Gede Sindang Barang, P.O. Box 161, Bogor 16001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Phone: 0251-625415, 625417, Fax: 0251-625416, Email: <a href="mailto:icraf-indonesia@cgiar.org">icraf-indonesia@cgiar.org</a></td>
<td><a href="http://www.worldagroforestrycentre.org/sea/Products/AFDbases/seedsupplier/index.asp">http://www.worldagroforestrycentre.org/sea/Products/AFDbases/seedsupplier/index.asp</a></td>
</tr>
<tr>
<td>Inland and Foreign Trading Company</td>
<td>Block 1090, #04-04/05, Lower Delta Road, Tiong Bahru Industrial Estate, Singapore 169201</td>
<td><a href="http://www.ifco.com.sg/#cover">http://www.ifco.com.sg/#cover</a></td>
</tr>
<tr>
<td></td>
<td>Phone: 65 2722 711, Fax: 65 2716 118, Email: <a href="mailto:ifco@pacific.net.sg">ifco@pacific.net.sg</a></td>
<td></td>
</tr>
<tr>
<td>Kimseed</td>
<td>42 Sarich Court, Osborne Park, Western Australia, 6017</td>
<td><a href="http://www.kimseed.com.au/frameset.html">http://www.kimseed.com.au/frameset.html</a></td>
</tr>
<tr>
<td></td>
<td>Phone: 61 8 9446 4377, Fax: 61 8 9446 3444, Email: <a href="mailto:kimseed@kimseed.com.au">kimseed@kimseed.com.au</a></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Phone: 202-547-3800, Fax: 202-546-4784, Email: <a href="mailto:wsp@newforests.com">wsp@newforests.com</a></td>
<td></td>
</tr>
<tr>
<td>New Zealand Tree Seeds</td>
<td>P.O. Box 435, Rangiora, New Zealand 8254</td>
<td><a href="http://www.nzseeds.co.nz/">http://www.nzseeds.co.nz/</a></td>
</tr>
<tr>
<td></td>
<td>Phone: 64-3-3121635, Fax: 64-3-3121638, Email: <a href="mailto:sales@nzseeds.co.nz">sales@nzseeds.co.nz</a></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Phone: 800-780-5902, Fax: 775-841-4022, Email: <a href="mailto:Info@rain-tree.com">Info@rain-tree.com</a></td>
<td></td>
</tr>
<tr>
<td>Sheffields Seed Company</td>
<td>269 Auburn Road, Route 34, Locke, New York 13092, U.S.A.</td>
<td><a href="http://www.sheffields.com/">http://www.sheffields.com/</a></td>
</tr>
<tr>
<td></td>
<td>Phone: (315) 497-1058, Fax: (315) 497-1059, Email: <a href="mailto:seed@sheffields.com">seed@sheffields.com</a></td>
<td></td>
</tr>
<tr>
<td>The Banana Tree Inc.</td>
<td>715 Northampton St., Easton, PA 18042, U.S.A.</td>
<td><a href="http://www.banana-tree.com/">http://www.banana-tree.com/</a></td>
</tr>
<tr>
<td></td>
<td>Fax: 610-233-4864</td>
<td></td>
</tr>
<tr>
<td>Tree Seed Supplier Directory</td>
<td>Supplier information accessed from website by clicking on 'Botanic Nomenclature' and then on 'Botanic' or 'Common' name search</td>
<td><a href="http://www.worldagroforestrycentre.org/Sites/TreEDBS/TSSD/treesdd.htm">http://www.worldagroforestrycentre.org/Sites/TreEDBS/TSSD/treesdd.htm</a></td>
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### Table 6. RELATED RESOURCES AND ORGANIZATIONS FOUND ONLINE

<table>
<thead>
<tr>
<th>Type of information</th>
<th>Website URL and/or mailing address</th>
</tr>
</thead>
</table>
2) California Rare Fruit Growers (fruit facts): [http://www.crfg.org/](http://www.crfg.org/)  
4) EDIS (by Univ. of Florida; fact sheets on tropical fruits): [http://edis.ifas.ufl.edu/](http://edis.ifas.ufl.edu/)  
7) Neem Foundation (information on neem): [http://www.neemfoundation.org](http://www.neemfoundation.org)  
8) NewCROP (crop database by Purdue University): [http://www.hort.purdue.edu/newcrop/default.html](http://www.hort.purdue.edu/newcrop/default.html)  
10) Oxford Plant Systematics (technical information; herbarium images): [http://herbaria.plants.ox.ac.uk/](http://herbaria.plants.ox.ac.uk/)  
12) Traditional Tree Initiative (species information and selection): [http://www.traditionaltree.org](http://www.traditionaltree.org)  
| **Organizations involved in agroforestry, many of which provide useful information about their projects.** | 1) Agroforestia.net (dedicated to agroforestry in Brazil; Portuguese): [http://www.agroforestia.net](http://www.agroforestia.net)  
2) Agroforestry.net (links to many organizations): [http://agroforestry.net/links.html](http://agroforestry.net/links.html)  
6) C. Guillermo Viscarra N° 125 (Casi Uyuni), zona Tupuraya  
7) Floresta (programs in the Dominican Republic, Haiti, Mexico, and Tanzania): [http://www.floresta.org](http://www.floresta.org)  
9) KENGO, PO Box 48197, Nairobi, Kenya  
10) Petawawa Forestry Institute (research and information): [http://www.glfc.forestry.ca/petawawa/index_e.html](http://www.glfc.forestry.ca/petawawa/index_e.html)  
12) RWEDP (publications by the Regional Wood Energy Development Programme in Asia): [http://www.rwedp.org](http://www.rwedp.org)  
13) USDA Forest Service (information about international projects): [http://www.fs.fed.us/global/topic/welcome.htm](http://www.fs.fed.us/global/topic/welcome.htm)  

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**Publications/books, research results and/or information on forestry-related subjects**

2) DANIDA: [http://www.sl.kvl.dk/Publicationer.aspx](http://www.sl.kvl.dk/Publicationer.aspx)  
3) Living fences- by Cornell University: [http://ppathw3.cals.cornell.edu/mba_project/livefence.html](http://ppathw3.cals.cornell.edu/mba_project/livefence.html)  
5) Tropical Tree Seed Manual: [http://www.mgr.net/Publications/ttsm](http://www.mgr.net/Publications/ttsm)  
7) USDA National Agroforestry Center: [http://www.unl.edu/nac](http://www.unl.edu/nac)  
### Table 7: Adaptation and Photos of Principal Tree Species

<table>
<thead>
<tr>
<th>Tree Species</th>
<th>Adaptation</th>
<th>Photo by Tim Motis</th>
<th>Photo by Tim Motis</th>
<th>Photo by Tim Motis</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Bursera simaruba</em></td>
<td>hot, dry tropics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Calliandra calothyrsus</em></td>
<td>wet tropics</td>
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