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The Overstory

#38

Live Fences

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The [Overstory #32](#) covered multipurpose boundary planting which are used for wind protection. In this edition of The Overstory, special guest authors Stefan D. Cherry and Erick C.M. Fernandes summarize strategies for boundary plantings that can serve as live fences.

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**Live Fences**

Live fences can be divided into two basic categories; live fence posts and live barriers or hedges. Live fence posts are widely spaced, single lines of woody plants that are regularly pruned back and used instead of metal or wooden posts for supporting barbed wire, bamboo or other materials. Hedges are thicker, more densely spaced fences that generally include a number of different species and usually do not support other fencing materials.

The primary purpose of live fences is to control the movement of animals and people, however, they have proven to be extremely diverse, low risk systems that provide farmers with numerous benefits. Besides their main function living fences can provide fuelwood, fodder and food, act as wind breaks or

enrich the soil, depending on the species used.

### ::::: Live Fence Posts :::::

Live fence posts are commonly found in conventional barbed wire fences. In many cases, the trees and shrubs that appear along fence lines, originate from seeds deposited by birds perching on dead fence posts and the fence wire. In other cases, farmers may deliberately plant stakes of easy to root species such as *Gliricidia sepium*, *Erythrina* spp., *Spondias* spp., and *Bursera simarouba*. The live fence posts are far more durable than traditional wooden posts as they are more resistant to attack by termites and decay fungi.

When grazing or browsing animals are part of the farming system, the only way to establish live fence posts and eventually a living fence, is to start with a conventional wire fence supported by dead fence posts and to gradually establish live fence posts to substitute for the decaying posts.

The species used for live fence posts must have the ability to rapidly form a callus and cover over the point of attachment of the wire to the post. The callus protects the wood from attack by decay fungi and wood-boring insects. Tree or shrub species that have a resin or sap that is corrosive to metal, should be avoided. Otherwise, the wire breaks a few months after being attached to the live fence post.

*Gliricidia sepium* is the most common live fence post species in Central America and in other tropical areas because of the ease with which large stem cuttings root and its multiple uses such as forage, green manure and its properties as a rat poison. Farmers commonly start the establishment of *Gliricidia* live fence posts by planting a few large (1.5-2.0 m) stakes in the existing conventional wire fence. These stakes normally take root within a month or so and farmers allow the shoots to grow for 6 to 10 months before cutting them back. After the first pruning, prunings can be carried out every 4 to 8 months. Shoot pruning at intervals of 6 to 8 months result in woody sprouts that are suitable for use as stakes. Farmers are thus able to multiply live stakes for their fence posts within a year or two after establishing the first live fence posts.

## :::: Live Fences ::::

Most resource-poor food crop farmers do not have sufficient capital to purchase barbed wire or other fencing materials. As an alternative, more and more farmers are using a number of different tree and shrub species to establish dense, often thorny, hedges to protect their crops. Another alternative often used by farmers is the combination of easy to establish live fence posts and poisonous or unpalatable species. An example southwestern Ethiopia combines *Erythrina abyssinica* with *Euphorbia tirucalli*. The latex of *E. tirucalli* is highly toxic and the plant is generally avoided by livestock. If well established, these natural barriers can deter both animal and human trespassers from entering into the farm.

Many farmers also use live fences as a method of demarcating their farms. Although agroforestry may not be appropriate under certain land tenure circumstances, live fences can serve as one method of securing land ownership where the law permits.

## :::: Products and Services from Live Fences ::::

The term multipurpose tree is often used when referring to the more useful agroforestry species such as *Leucaena*, *Gliricidia* and many others. Multipurpose trees such as these when incorporated into live fences can also provide fuelwood, nutrient-rich mulch, erosion control and land stabilization, as well as other products such as food and fencing materials and a source of high quality forage for ruminants.

**Seed Banks** Live fences that can serve as functional seed banks. For example, in Cameroon, where an increasing number of farmers are becoming interested in experimenting with agroforestry, non-governmental organizations are buying seeds of *Calliandra calothyrsus* from farmers at a cost of 4,000 CFA (US \$8.00) per kilogram for distribution to other farmers. Seeds of *Tephrosia vogelii*, a bi-annual, leguminous shrub used for shorter-term live fences and improved fallows, can be bought in the market during most of the year within the region of the Kom ethnic group in the northwest province.

**Protection of Farmland** In the river valleys of eastern Sonora, Mexico, flood plain farming is dependent upon living fences. Fences of willow and cottonwood maintain, extend and enhance flood plain fields. These ecological filters also protect fields from cattle, harbor agents of biological control of pests, and provide renewable supplies of wood. Farmers often allow live fences to grow tall and serve as windbreaks to protect cropland.

**Fodder and Fuelwood** Leaves, branches and twigs pruned from live fences and live fence posts provide farmers with an on farm source of fodder and fuelwood. Pruning intervals of 2 to 3 months yield more leafy material than pruning intervals of 4 to 8 months which result in more woody material. This allows farmers to choose which product is of higher priority during different times of the year and adjust their management techniques accordingly. A study in Embu, Kenya found that fresh foliage of *Calliandra calothyrsus* increased butterfat content of milk by about 10% when fed to lactating cows. Live fences around the perimeter of the farm can act as nutrient traps, preventing loss of nutrients that could normally be lost through leaching or surface runoff.

**Fruits, Flowers and Medicinal Products** Farmers can also plant fruit trees to supplement their diet and provide the household with important micronutrients, often lacking in some diets. The fruit can also be sold in the market to contribute to household income. There are a number of tropical fruit trees that have been incorporated into live fencing systems in Cameroon either as fence posts or within live fence hedgerows including guava, citrus, Bush plum (*Canarium* sp.), *Inga edulis*, *Spondias mombin*, *Moringa oleifera*, and a variety of palm species. A variety of medicinal plants (*Prunus africana*, *Columbrina* spp., *Comiphora* spp., *Azadirachta indica*) are often grown in living fences.

::::: Conclusions :::::

Live fencing is one form of agroforestry that can provide a range of products and services on farmlands. Although live fencing systems are traditional, the extent of the many potential benefits and the number of different

farmer-developed systems are currently not well understood or even well documented. We can learn a lot from farmers who have been using live fences in their various farming systems and assist in farmer-to-farmer transfer of these technologies.

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The full version of this article with excellent photographs can be viewed at: <[http://ppathw3.cals.cornell.edu/mba\\_project/livefence.html](http://ppathw3.cals.cornell.edu/mba_project/livefence.html)> Financial support for the development of the original article was provided by the Cornell Agroforestry Working Group (CAWG) of the Cornell International Institute for Food Agriculture and Development (CIIFAD).

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### **Live Fence Video**

Soon to be available, a three-part video concerning live fencing presents the perspectives and management practices of small-scale farmers in Cameroon, West Africa. In the first part of the video the farmers describe crop destruction and why they have established live fences. In the second part, farmers demonstrate three main establishment practices and discuss some of the challenges related to creating a live fence. In the third part, farmers demonstrate how they maintain their own live fences and talk about tree species and how they choose which species to use. The 30 minute video is in English. The video will soon be distributed through ECHO, 17430 Durrance Rd., N. Ft. Myers, FL 33917 USA, Tel: 941 543 3246, Fax: 941 543 5317, ECHO@xc.org, <<http://www.echonet.org>>

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### **~~ Web Links ~~**

The Living Fence: Its role on the small farm by Dr. Franklin W. Martin  
<<http://www.echonet.org/LivingFence.html>>

Linear Agroforestry Technologies by ICRAF  
<[http://www.cgiar.org/icraf/res\\_dev/prog\\_5/tr\\_mat/slides/ag\\_tech/ag\\_tech.htm#4-17](http://www.cgiar.org/icraf/res_dev/prog_5/tr_mat/slides/ag_tech/ag_tech.htm#4-17)>

Outdoor Living Barn: A Specialized Windbreak by National Agroforestry Center <<http://www.unl.edu/nac/pubs/afnotes/afnwb2.htm>>

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**~~ Publisher Notes ~~**

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