

Natural wood preservatives show promise

Substances used to protect wood against insects and fungi can be extremely toxic for humans. Made mostly from petroleum products and heavy metals, these preservatives are harmful to the environment and pose health hazards. Pentachlorophenol, a solvent used to protect wood, is now prohibited in several industrialized countries. Arsenic-based preservatives are also expected to be eliminated eventually.

Countries like Tanzania, however, have little choice but to continue to use such products. Insects such as termites cause serious problems in most Eastern and Southern African countries. The use of preservatives on wood is essential. For 50 years, Tanzania has imported about 25 kinds of very expensive and highly

toxic materials for this purpose.

Researchers from **Forintek Canada** and their colleagues from the Tanzanian Industrial Research and Development Organization have been studying the effectiveness of preservatives made from cashew shells and the bark of certain trees as well as insecticides extracted from flowers such as the French marigold and the chrysanthemum. These preservatives, based on natural substances are less toxic and laboratory research has proven their effectiveness. They may also reduce the quantity of hazardous waste created from wood that has been treated with preservatives.

"If these products prove effective during field trials, there may be less of a demand for highly toxic agents," says Louis Calvé, a Forintek researcher.

The project, which is being financed by IDRC, may diminish the need for imported preservatives and encourage local industry. The new products could be made by small Tanzanian companies from local raw materials.

Contact: Louis Calvé
Researcher
FORINTEK Canada Corporation
Quebec City, Quebec
Tel: (418) 659-2647
Fax: (418) 659-2922
Internet: louis.calve@qc.forintek.ca

Pierre Zaya
Program Officer
IDRC, Ottawa
Tel: (613) 236-6163 ext. 2538
Internet: pzaya@idrc.ca

Thousand year-old farming system rediscovered

A thousand year-old farming system called *frijol tapado* that helps prevent erosion on fragile mountain slopes is once again proving its effectiveness in Latin America.

The method is used mainly by poor farmers in Mexico, Central America, and Colombia to grow beans on the steep slopes of mountains and volcanoes. Peasant farmers simply cut the tall grasses and then sow the beans by hand on the mulch. After harvesting, they leave the land fallow for two or three years to regenerate. In countries like Costa Rica, almost half of all farmers use this type of cultivation.

To date, agriculture officials have considered the *frijol tapado* inefficient and unworthy of attention. But the system does not require costly fertilizers, pesticides, or herbicides. The grasses that grow on the fallow land draw phosphorus from the volcanic soil and accumulate it.

"The method represents the ultimate in soil conservation," says Paul Voroney,

Professor of Soil Science at the **University of Guelph**. "It's used to grow crops on slopes that are too steep to be farmed otherwise. The mulch is needed for protection against erosion, which would carry away the precious layer of topsoil in less than one growing season."

Researchers are asking farmers all over Costa Rica to help find methods to improve production. They are examining the role of various grasses that take phosphorus and nitrogen from volcanic soils and are testing the use of powdered and granulated phosphorous rock for use as fertilizer. The results after two harvests in three regions of Costa Rica are impressive: yield increases from 30% to 130%, depending on soil types. Without the fertilizer, a small farmer can produce only about 750 kg of beans per hectare. The trials also showed that just one application of the product is enough to increase yield for more than one harvest. Furthermore, scientists are trying to find varieties of seed better suited to the various

regions and are experimenting with mixed crops such as growing maize and beans together.

The results should create jobs and increase the incomes of peasant farmers in this area of Latin America. The demand for crops grown without pesticides and chemical fertilizers is growing constantly in this part of the world. According to researchers, the *frijol tapado* is a model of sustainable agriculture whose main elements could be implemented on an international scale.

Contact: Paul Voroney
Land Resource Science
University of Guelph
Guelph, Ontario
Tel: (519) 824-4120 ext. 3057
Fax: (519) 824-5730
Internet: pvoroney@lrs.uoguelph.ca

Ronnie Vernooy
Program Officer
IDRC, Ottawa
Tel: (613) 236-6163 ext. 2229
Internet: rvernooy@idrc.ca

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