EDN

# ECHO Development Notes

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Issue 65

Edited by Martin Price, Ph.D.

## Issue Highlights



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## ECHO's Bookstore On-line

We opened the store in July and now have over 300 titles and growing. A unique feature is that you can click on the picture of the book and see the table of contents and usually the preface, introduction or whatever we thought would help you evaluate the book for your purposes.

You can access the store through our home page at www.echonet.org.

## QUICKGRANT Program

*By Martin Price*

"I know from our service in Guatemala and Honduras that a relatively small amount of money, at the moment, can make a big difference in people's lives. Would ECHO tell workers around the world of this opportunity?" writes Barbara Briggs-Letson, Project Officer for the Jadetree Two Foundation.

Jadetree Two Foundation offers QUICKGRANTs of up to US$300 to **empower a project or organization working for the poor which has an idea that would make a difference**. The entire grant application is only one page long and asks five questions. Decisions are made quickly. QUICKGRANTs are made to formal and informal grassroots projects worldwide.

There is one very important limitation. United States law only permits foundations to write checks to organizations registered as what we call a 501(c)(3) (that is legal language meaning that it must be an American NGO) or to churches.

When an American NGO or church "sponsors" the application, it verifies that it knows the person or group is honorable and reliable and is working with the poor. An NGO sponsor must enclose a copy of its 501(c)(3) form from the US government with the application. A church sponsor must be a church located in the USA and must enclose with the application a short letter stating its willingness to be a "sponsor" of the specific project. If a grant is made, the check will be made out and sent to the sponsor, who will then pass the monies on to the applicant.

The idea is to get the funds to a grass roots project quickly. They do not fund individuals or families, give scholarships, cover deficits, construct buildings, or support political activities, research, or conferences. By applying for a QUICKGRANT, one promises to (1) use the monies ONLY as stated in the application, (2) write Jadetree Two Foundation within a year about the project, and (3) enclose a photo.

Here are three recent examples of funded projects. (1) Purchase 27 rubber bulb syringes and 8 pair of surgical steel scissors for a group of trained midwives ($154). (2) Clear land and purchase vetiver grass to establish a plant bank to provide the

grass to small farmers for erosion control ($250). (3) Purchase 87 storybooks to begin a village children's library ($200).

If you know a good project within your community or a good idea among one or more national employees of your own organization, either you or the community leaders should request an application from Jadetree Two Foundation, 313 Florence Avenue, Sebastopol, CA 95472, USA; e-mail: Lucastoli@aol.com; phone: 707/829-6417; fax: 707/829-6949.

# Selection of Trees on which to Grow Vanilla

*By Daniel Sonke*

Wendy Rice, working in Uganda, wrote to ECHO and asked, "on what kind of trees do vanilla orchids grow? Or is there another way to grow them?" In the ECHO library we found the following information for Wendy in an article from the *Economic Botany* journal, vol. 7, no. 4, Oct.-Dec. 1953, titled "Vanilla - Its Botany, History, Cultivation and Economic Import."

Many tree species can be used for growing vanilla orchid. Actually, wooden or wire trellises can be used, too, as long as there is some protection from the sun. There may, however, be more vine breakage than with trees. We have successfully grown vanilla on man-made supports in several places around the ECHO farm.

Many, many species are used commercially around the globe as vanilla supports. Some of the most common are *Casuarina equisetifolia* (the Australian Pine) and *Jatropha curcas* (the Physic nut) used on plantations in Madagascar. *Erythrina* species are commonly used in Puerto Rico. These would almost certainly be American *Erythrina* species, but I know that there are African species as well. Even *Moringa oleifera*, a popular species with readers of EDN, is listed as a potential species.

Potential support trees which themselves provide potentially useful crops include coffee, oil palm, avocado, mango, yellow and red mombin (*Spondias* sp.), loquat, calabash tree (*Crescentia cujete*), and cassava (manioc). *Gliricidia sepium*, *Albizia lebbeck*, and *Erythrina* species are among many leguminous trees that have been used. Leguminous trees may help build soil health.

According to the authors of the *Economic Botany* article, the characteristics you want in a vanilla support species include:

- small leaves which allow filtered sunlight
- branches growing low enough (5-7 feet, 1.5-2.1m) to the ground for harvesting and hand pollination
- enough strength to support the vine in a strong wind
- leaves on the tree year round
- propagation from large cuttings for rapid early growth

If possible, trees should be planted a year or more before the vanilla cuttings are set out so that they have had time to produce adequate support and shelter for the vines. If there is not enough shade, bananas or even maize are sometimes planted nearby for shade. Additionally, if strong winds are a potential problem, wind breaks of strong, thickly branched, wind-resistant shrubs or small trees can be planted on the windward side of the area.

Before planting vanilla, readers should also know that the vine requires hand-pollination outside of Mexico and other regions where it is indigenous. Even in Mexico, commercial producers use hand-pollination to control production.

If you are considering vanilla production in your development work and are unable to obtain a copy of the *Economic Botany* article from a library, write to ECHO. The ECHO library will send a single photocopy to those working for development of small-scale farms in developing nations. Please enclose $6 for copying the 67 pages and airmail costs.

# How to Make Your Own Salt Licks and Urea Blocks

*By Kristin Davis*

Ruminant livestock production in the tropics is sometimes limited by the animals' diets, which are often lacking in minerals necessary for good growth and health. Mineral content is quite variable in tropical plants and soils, and mineral uptake is complicated by many different factors. Salt licks can provide the minerals that are often lacking, such as phosphorus, sodium, calcium and magnesium.

Salt licks can be purchased to improve production, but limited cash and/or proximity to a town or village may prohibit doing so regularly. It is possible, however, to make your own salt lick out of local ingredients.

Different materials can be put into salt licks to provide the necessary nutrients. The simplest recipe for making a salt lick comes from Ibrahima Diallo of Veterinarians Without Borders (published in *Baobab* 21, December 1996).

The ingredients required are bones, salt and clay. To make bone meal, first burn, crush and sift the bones. (See EDN 55-1 for how to make bone meal.) Pound and sift clay from a termite mound. Then mix two parts rock salt, four parts bone powder and one part of termite clay and add enough water to create a paste. The paste can then be molded by putting it in wooden boxes, in wide metal bowls or calabashes with holes in them (for aeration), or in big tin

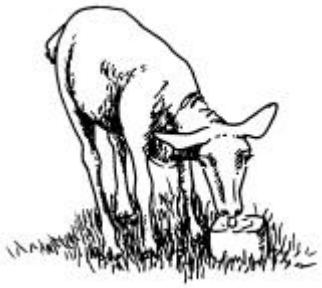
cans lined with plastic bags (remove the salt lick when dry). Once dried, put the salt licks out for your livestock.

Another method of making a lick is with bone meal, cement, salt and sifted ashes. Mix everything together with enough water to make a paste, then mold and allow it to dry for two weeks until the cement has hardened. To make one block of salt lick (10 kg in weight), you will need 6.3 kg of salt, 1.5 kg of bone meal, 0.6 kg of ashes and 1.6 kg of cement. The salt block will improve in quality if you reduce the amount of salt and increase the bonemeal content.

Charlie Forst, head of ECHO's new appropriate technology program, suggests this recipe for salt licks:

| | |
|---|---|
| Salt or mineral salt | 82% |
| Bone meal | 4% |
| Lime (crushed shells or agricultural lime) | 2% |
| Cement, good clay or a mixture of the two | 12% |

Add water, making sure that it is only enough to form the mixture in a mold. You should not be able to squeeze any water out of the mixture. As an option, some molasses can be added to sweeten and to help bind the mixture. Molasses should be added before the water since it will also provide some moisture.



Some farmers and community groups have started producing salt licks for sale in their village as an income-generating activity. Farmers in Kenya could not afford commercial salt blocks, but when some farmers' groups started producing local salt licks, villagers began buying them. A half-kilo block sells for US$0.80. (From *Baobab* 28, March 1999).

A second limiting factor in livestock production is the poor digestibility of some feeds, especially in the dry season. When animals are getting mostly low-quality, low-protein feeds such as the dry stalks of cereals, they have a hard time digesting them and therefore tend to lose weight and decrease performance. To increase the amount of digestible matter, the animals need a source of nitrogen to help them break down their feed.

For ruminants only, extra nitrogen can come from urea blocks. The urea in blocks is utilized by the microbes in the rumen to manufacture protein, thus increasing roughage intake and improving weight gain. When coupled with the minerals added to the urea block, performance is improved. *Baobab* 25, March 1995, describes how to make a urea block. You will need 1 kg of urea, 1.5 kg of cement, 6.5 kg of bran (or winnowings from beans), 1 kg of salt and 5-6 liters of water. Dissolve the urea in water and mix together the pounded salt, the bran and the cement. Slowly add the urea liquid to the dry ingredients until it is a thick paste. Put this in a mold and allow to dry for about two weeks. Again, molasses can be added in place of some of the water. Molasses helps to bind the urea in the block.

The urea in the block can be harmful to livestock if too much is consumed. It should be given to animals in controlled amounts, starting with small amounts and gradually increasing it over a period of several weeks. The most a cow or camel should consume per day is 500 g, and a sheep or goat not more than 120 g. Urea blocks are only used for ruminants such as cattle, sheep, goats and camels.

# ECHO's Seedbank

ECHO recently acquired a fresh lot of tropical and subtropical forage legumes from Australia. The following species are available:

- *Clitoria ternatea*, Butterfly Pea. Very drought-tolerant legume used as green manure and fodder. Likes to climb 4-5 feet. Small leaves; not a thick groundcover. Bright purple flowers used for dye.
- *Centrosema pascuorum*, 'Cavalcade' Centurion. Requires high growing season temps. Wide soil adaptation, 700-1500mm rain, early flowering. Arid region native can take seasonal flooding.
- *Aeschynomene americana*, 'Glenn' Joint Vetch. Used for green manure and forage purposes. Requires minimum of 1000mm of rainfall/year. Reseeding annual, thick growth. Has done well at ECHO.
- *Neonotonia wightii*, Glycine. Needs good drainage. Best on 30-60 inches of rain per year. Sow during rainy season. Slow to establish. Good on poor basaltic soils.
- *Lablab purpureus*, 'Highworth' Lablab or Hyacinth Bean. Eat pods when young and tender. Drought-tolerant forage and green manure cover crop.
- *Cassia rotundifolia*, 'Wynn' Roundleaf cassia. Best adapted to light-textured soils. At least 600mm mean annual rainfall is required.
- *Stylosanthes hamata*, Stylo Caribbean. Heat loving; drought tolerant, but may drop leaves. Doesn't like cool weather and is not shade tolerant. Best on 600-1700mm of rain per year.

The following non-hybrid tomato varieties are also available:

- 'Tropic': Large, stake-type variety; high yields. Resistant to Verticillium, Fusarium, Grey Leaf Spot, Graywall, Tobacco Mosaic and Leaf Molds.
- 'Floradade': Developed by U. of Florida. Resistant to Verticillium and Fusarium Wilt races 1 & 2, Gray

Leafspot.

- 'Super Beefsteak': Large, meaty fruits on prolific, vigorous plants. 17 oz. fruits.
- 'Homestead 24': Yields 7 oz. fruits under difficult growing conditions.
- 'Roma VFN': Pear shaped fruit used fresh or for paste. Disease Resistant.

Trial-sized packets are available free of charge to those working with small-scale farmers in developing nations. All others please send $2.50 per packet, including shipping.

# For Your Interest Only

**The Terminator Gene is Dead**. As this issue was going to press we heard that Monsanto has decided that they will abandon their plans to use the terminator gene. (See EDN 61-5 and 62-5). They cited criticism from world leaders, especially those in Third World countries. This new development in genetic engineering would have produced seeds of major crops that would produce one crop but seeds saved from the crop would not germinate. It would have been used with crops for which hybrid seeds are not sold, like wheat and rice. The goal had been to recover costs of developing new varieties by forcing farmers to purchase new seed each year.

**Is there an Ebola Home Remedy?** A brief article in Newsweek magazine (August 16) reports that "A plant long chewed, brewed for tea and applied as a balm by West Africans has proven lethal in laboratory trials to the Ebola virus. Twigs of the *Garcinia kola* tree are commonly offered as chewing sticks to guests." It has been used in yellow fever and influenza trials. "In the most recent tests, compounds distilled from the plant's seeds halted replication of the Ebola virus without killing host cells. If it works in primate trials," says Dr. Iwu, a Nigerian from a family of traditional healers, "it will be a very significant discovery." I can anticipate your next question: "Is this the same tree that soft drink cola comes from?" No. The commercial cola used in soft drinks comes from *Cola nitida.* ECHO does NOT have seeds of either cola to distribute.

**Two Drugs at Once for Malaria.** *The following is based on an article in Reuters Health News, June 4, 1999.* Due to worries about drug-resistant strains of the malaria parasite, patients with malaria should be treated with a two-drug combination, an international group of malaria experts advises in the an article entitled "Averting a Malaria Disaster" in the June 5th issue of *The Lancet* 1999;353: 1965-1967.

"To treat tuberculosis or AIDS with a single drug is no longer regarded as ethical. We believe the same principle should apply to the treatment of malaria," writes Dr. P. Olliaro of the World Health Organization and colleagues. The experts warn that a "health calamity looms within the next few years" unless the spread of malaria strains resistant to current antimalarial agents can be significantly curtailed.

They recommend using two antimalarial agents with independent modes of action right from the start to slow the evolution of resistance. "Compared with sequential use of single drugs, which is current policy, combinations will impede the development of resistance substantially." They recommend chloroquine or pyrimethamine-sulphadoxine (PSD) coupled with artemisinin or an artemisinin derivative as first-line therapy.

"Artemisinin and its derivatives are remarkably well tolerated and, to date, no significant resistance has been reported either in clinical isolates or in laboratory experiments." A two drug combination containing artemisinin "could buy 5 or 10 years' extra life for the available affordable antimalarial drugs," and permits time for the research community to develop new antimalarial agents. Olliaro and colleagues conclude that "time is running out," especially in many parts of Africa, where chloroquine-resistant malaria strains are now common.

# ECHOES FROM OUR NETWORK

## Pregnant Women Should Not Use Papaya Seed to Treat for Worms

*Mark MacLachlan, SIM, Ethiopia*

Mark wrote concerning taking papaya seed to treat for stomach worms (EDN 63-7). "Let me add one note of caution. The seeds are also used in some cultures to induce abortions. Women who are or might be pregnant should probably not use the seed for medicinal purposes."

## Paprika as a Cash Crop

*By Brian Hilton, World Vision, Mozambique*

**Production and Marketing**

Paprika belongs to the species of *Capsicum annuum*, which includes both pungent and sweet peppers. Peppers belong to the larger family of Solanaceae which includes tobacco (*Nicotiana tabacum*), tomato (*Lycopersicon esculentum*) and "Irish" potato (*Solanum tuberosum*). This is of very practical importance because paprika suffers many diseases common to these plants such as Potato virus Y and cucumber mosaic and tobacco mosaic viruses. Hence the

above crops are not suitable for a rotation within 3 years and preferably should not be grown close to paprika. Capsicum fruits owe their pungency to the presence of a volatile phenolic compound called capsaicin. Pungency, in reference to paprika, means degree of hotness. Pungency, along with the color, primarily determine the grade and price of the paprika, so it is very important. Some paprikas are "sweet" (lack pungency), other paprikas are "hot" (have various levels of pungency). Paprika is high in vitamin C and also contains vitamins A and E.

**Cultivation**

Paprika can be cultivated from sea level to 1,500 meters. Optimum temperatures are from 24-32$^{o}$C (75-90°F). Plants do not thrive in cool temperatures and the flowers are killed by frost. They like a loamy soil with good water holding capacity. It will not tolerate sandy soils with constant water stress. Paprika can be grown either in the rainy season or in the dry season on residual moisture in lowland areas.

Seeds are planted in a nursery and transplanted at about 5 weeks. The transplanting is tricky and labor intensive; the seedlings have to be properly hardened off, removed without damaging the roots, and replanted with the taproot down to prevent curl. Transplanting is best done on a cloudy day in very moist soil. Because of the difficulty of this operation, some farmers in Mozambique have elected to plant seed directly into the field and then thin to the desired population, but most now transplant.

Paprika plants are delicate in the early stages and should be watered if rainfall is irregular. Most guides recommend 80,000 plants/ha. The field should be ridged to protect plants from excess water in the rainy season and channel water to plants in the dry season if irrigation is available. Paprika is a poor competitor and susceptible to a number of pests and diseases. Weeding needs to be done diligently. We have not used pesticides in Mozambique but it would be advantageous to have them on hand. Paprika is responsive to fertilizer but we have had good success in fertile lowland soils without fertilizers. If nitrogen is applied, frequent topdressings are preferable as paprika roots are not extensive and nitrogen deficiency can quickly set in.

As with any new crop, it has taken both our extension agents and farmers a couple of years of trial and error to get the cultural practices correct.

**Harvest and Post Harvest**

It takes about 2 months for the fruits to turn from green to dark maroon. In the first years our farmers were picking too early and losing money because of lower color content. Fruits should be picked when they are dark maroon and beginning to wrinkle. Picking is quicker when the fruits are dry and the drying process is also quicker (7 days or less). Fruits should be washed if dirty and de-stalked (remove petiole and seed) and split to facilitate drying. If orange or red pods fall from the plant they can be split, dried and sold as lower grade paprika. It is best not to use jute bags as the jute fibers get on the paprika and lower the quality. Washed fertilizer bags or polyethylene bags are better. Paprika should be stored in a cool dry place and sold as soon as possible. Rats like paprika so care must be taken to protect the crop. The color also deteriorates in storage, which decreases the value of the crop.

**Marketing**

Paprika is an important ingredient in foods both for its flavor and coloring properties. In Europe the Spanish are the biggest buyers and consumers of paprika. Paprika is an ingredient in many Spanish, Hungarian and Mexican foods and markets are growing. In addition, a natural food color, called an oleoresin, is extracted from dried paprika with a solvent. Because it is soluble in vegetable oil but not water, it is a valued natural red food color for fat-containing products like sausages, cheeses, salad dressings, shampoos and lipsticks. World demand for paprika is about 50,000 tons per year of which 500 tons is oleoresin. Demand is rising but a multitude of farmers in Southern Africa (Zambia, Zimbabwe, Malawi, and South Africa) is switching from tobacco to paprika, which may affect prices.

Prices paid for dried paprika depend on the grade, which in turn depends on the ASTA levels. ASTA stands for American Spice Traders Association but the acronym is used as a measure of the level of capsanthin and capsorubin, natural red colorants in paprika. The procedure involves extracting paprika pigments in acetone and measuring the adsorption of red light. Paprika with a deep dark uniform maroon color (the color of red wine) has the highest ASTA content (>230) and receives grade A prices. Buyers can determine this visually. There can be 2-4 grades depending on the company purchasing. Orange or red paprika that is not uniform in color will receive the lowest grade. Diseased or moldy paprika is not accepted. When a paprika shipment is brought to the purchasers there are people who will taste the paprika to determine if it is sweet or hot. Hot paprika will be rejected here. **This is very important because paprika for export is sweet and produced from hybrid seed. Replanting the seed the following year will produce hot paprika not suitable for sale.** Hence paprika farmers are forced to buy new hybrid seed every year. In Malawi, prices for paprika are about US$1.10-1.60/kg for Grade A dried fruits, depending on proximity to export corridors to South Africa.

**Our Experience**

Paprika is one crop that is better grown with a company that is in the business of paprika and promotes the crop. The company furnishes the seed, buys the crop, and exports it (they may even spray the crop if insects are a problem). Since markets for paprika are in Europe, the company must arrange credit for purchase, storage, export licenses,

shipping, foreign exchange, etc. The more exacting the market in terms of quality control, the greater the barrier caused by poor infrastructure and facilities like we have in Mozambique.

We were originally working with a local company that was buying paprika and selling seed (we were doing the extension). But the company was poorly financed and went out of business. That is when our problems started. We have had to help farmers take paprika from Mozambique to Malawi for sale. The sales involve transporting the paprika across rivers by canoe and renting truck space to travel to distant markets in Malawi where paprika is purchased. Not only does it eat a big hole in profits but also poor farmers do not like the trouble of having to market their crops in such a complicated manner. They prefer selling at the farm-gate even if prices are much lower.

We have had to purchase seed from Malawi to sell to farmers in Mozambique. Project farmers are harvesting several tons of paprika annually. But these quantities are not big enough to entice foreign companies to Mozambique to buy the crop. A company in Zimbabwe said that farmers would need to produce 40 tons in order for it to be worth sending trucks to Mozambique to get it. Having said this, I should mention that there is also money in paprika. Some farmers bought bicycles from the profits of the sale of paprika from only 0.05 hectares. We encouraged farmers to keep their plots small so as not to incur too much risk in the first years. On a per hectare basis, farmers can get 0.5 to over 2 tons of paprika/ha depending on their growing conditions. We have not given up on paprika production because several companies have expressed interest in entering the market in Mozambique. It would be a big advantage to them to have farmers who already know how to grow it. However we are now cautious and considering marketing and company involvement carefully before getting into other spice crops. END -- discussion follows.

**Additional Comments from the Editor.** We sent a copy of this article to Dr. Terry Berke at the Asian Vegetable Research and Development station in Taiwan for his comments. In the meantime we spent some time looking for a picture of a paprika plant without success. It turns out that there is a good reason we could not find a picture.

Dr. Berke writes, "Paprika is defined as a dried red powder. There is no such thing as a paprika plant. There are pepper varieties that are suitable for making paprika. The fruit size and shape is irrelevant, the only thing that matters is the quality of the dried red powder that comes from the fruit. Paprika can be sweet, mildly pungent, or pungent. The major producers are Hungary and Spain, the major importers are the U.S. and Germany."

Editor: What do you think of his statement that those who save seed from hybrids have hot peppers that ruin the value of the lot? If hot is the dominant trait, I can't imagine how it could arise from a hybrid that was not hot.

Berke: "A sweet variety should give sweet progeny, unless it is contaminated by cross-pollination from a hot variety. All the paprika varieties in our collection at AVRDC are open-pollinated inbreds, not hybrids. I suspect the paprika-export companies tell the farmers that they are hybrids and they can't save seeds so that they can continue to sell them seeds year after year at high prices. I am working on a guide for production of pure, high-quality, self-pollinated pepper seeds. I'll send you a copy when it's finished."

Dr. Hilton replies: "I have no doubt about Dr. Berke's comments with regard to hybrid seed. Farmers here are told that it is special hybrid seed that they need to buy from the company every year. I phoned Mark Brag, the production manager for the outgrower program of Cheetah Paprika in Zambia (6,000 farmers). He said they only buy paprika from farmers who have purchased seed from Cheetah. Pungency is the main problem (from outcrossing with hot chilies) but also the company seed is treated with fungicide and is uniform and freer from seed borne diseases. I think I understand why they have this policy, as it would provide a more uniform, higher value product for purchase by the company. The company may also make more money from seed sales to farmers but I doubt it is the main factor."

Dr. Berke continues: "The optimum temperature for paprika types is probably a little high, should be more like 21-29 C, although the night temperature is the critical temperature (as it is for all peppers). They can tolerate daytime highs of 35º C (95º F) if the nighttime low is 22-24º C (72-75°F) and adequate water is available. The plant population density of 80,000/ha seems a little high, we use 30,000 here, but if no mulch is used, a higher density would develop a dense canopy faster and shade the ground. The transplants should be grown under nets to prevent aphids from infecting the crop with viruses at the seedling stage."

Dr. Hilton: "Mark Brag said they recommend this population density for (rainy season) dryland conditions in Zambia because of a 15-20% mortality that occurs at transplanting. Cheetah recommends only 60,000 plants/ha under irrigated conditions with mortality from transplanting at less than 10%. I asked our production agronomist what we use on our stations and what we recommend to farmers and he says we use 75 cm x 30 cm spacing for a population of about 45,000 plants/ha and getting quite satisfactory results. I found another extension publication from Zimbabwe that recommends spacing of 90 cm between the rows with two plants per station every 55 cm which is about 40,000 plants/ha. Perhaps a range of 30,000-80,000 could be recommended as a transplanting population depending on intensity of management with a note on the mortality that occurs in rainy season dryland conditions."

## Tephrosia Fallow Management in Cameroon

*By Stefan Cherry, Cameroon*

[Editor: In *Amaranth to Zai Holes: ideas for growing food under difficult conditions* page 203 we described how tephrosia *(Tephrosia vogelii*), a plant used on contour barriers in southern and eastern Africa for erosion control, was also being used to make an insecticide. Stefan Cherry, who just received his masters from Cornell University, shares additional insights from a community in Cameroon where it is an integral part of the farming system.]

Oral, painted, and written accounts tell how the first of the Kom people to settle in the Northwest Province of Cameroon followed a large snake up through the winding valleys, along the mountain sides to the top of Laikom, a mystical, mountain-perch. There the chief's palace was built and has sat for approximately two centuries. Today, the Kom ethnic group has a population well over 150,000 people and covers an area of about 650 to 800 square kilometers.

*Tephrosia fallow in Cameroon*

With this rich cultural tradition comes a similarly interesting agricultural history. This includes the development of a widely used but little studied indigenous fallow management system using the biannual, woody legume, *Tephrosia vogelii*. As part of a global initiative studying indigenous upland fallow management systems, I returned to this spectacular part of Central Africa, where I had previously worked as an agroforestry extension agent with the Peace Corps. I spent five days working with a number of women's farming groups, farmers, government extension agents, and field staff from an integrated conservation and development project (ICDP), called the Ijim Mountain Forest Project, conducting an initial characterization of the tephrosia fallow system. Using a number of participatory rural appraisal (PRA) techniques (including community mapping, transects, matrix ranking, farm/fallow inventories and others) we looked at five communities ranging in elevation from 1,000 to 2,500+ meters above sea level.

Before the women of Kom started managing the current species of *Tephrosia vogelii* (known locally as Tekoin-nya) within their rotational fallow system, they used a stunted species of tephrosia that did not provide as much leafy and woody biomass. Before that, an even smaller legume locally known as Alang (*Crassocephalum mannii*) was used. These other legumes, as well as a local variety of *Sesbania spp*., are still found in the region. However, since the early to mid 1950s when *Tephrosia vogelii* was introduced from the neighboring Nso region, it is estimated that more than 70 percent of Kom farmers have been actively managing this useful legume as an integral part of their farming system.

Farmers say that the primary benefit from tephrosia is its use as a green manure for improved soil health. Secondary benefits of the leaves include fish poison, traditional medicine, crop protection against aphids, and treatment of diarrhea in chickens. The woody stems are used as bean poles and stakes for yam production. More importantly, the stems provide a major source of cooking fuel.

Farmers felt strongly that the fuelwood acquired from the fallow system significantly reduced pressure on the montane forest above their communities. Tephrosia also serves to create shade on the farm to protect infants from the sun and is sometimes planted to create a temporary live fence around compounds and gardens. When asked about using tephrosia as a green manure and its effects on soil, the women not only discussed its importance in fertility replenishment for sustainable maize yields; they also alluded to improved soil physics with its impact on soil structure and tilth, particularly noticed during land preparation. They praised tephrosia for its ability to reduce erosion on steep, hillside farms and to suppress noxious weeds like spear grass (*Imperata cylindrica*).

When asked about the major drawbacks of tephrosia, the women mentioned that goats eat it when it is planted near compounds; it is susceptible to weevils and, in some cases, there is not enough seed when the plant is not allowed to reach maturity due to increasing land pressure.

*Tephrosia*

The fallow system works most effectively on a three-field rotation. Farmers typically interplant tephrosia on one field in March with the first cycle of corn, beans and potatoes; they thin the young plants during weeding and allow the tephrosia to dominate the field after harvesting the maize in August. In a second field, the tephrosia planted in the

previous year has established a thick canopy of leaves, covering the soil and serves to suppress weeds. In June, the farmers clear a third field of tephrosia, planted two years previously, harvest the fuelwood, incorporate the green manure, and cultivate crops in the second cycle of the eight-month rainy season.

This allows for two cycles of crops each year, with one field always in fallow, one coming out of fallow, and one going into fallow. A small number of farmers are starting to experience the pressures of increasing population and decreasing land availability. However, most women interviewed are planning to continue practicing this indigenous method of fallow management and to pass the knowledge to their daughters. The few who do not have sufficient land to fully take advantage of the tephrosia system have expressed interest in experimenting with incorporating perennial legumes into their farming systems. While in the region, I linked these farmers with conservation and development field staff to facilitate this experimentation.
END

## Report on the Conference for Christian Agricultural Workers in Tanzania.

Brian Polkinghorne writes, "Warm greetings in the Lord's name from Tanzania. Your message of greetings to our Conference participants was read on 17-5-99 and we prayed for our compatriots who were meeting at the same time in Haiti.

"Overall the conference was a great success I believe. We had 32 participants. We decided to meet together next year and are publishing proceedings from the conference. Dennis Murnyak whom I meet at the Kenya conference did a fine job of organizing everything. We did not receive any financial assistance, so I was surprised that 32 people could come up with about $55 each to attend. I personally made some good contacts and was stimulated to think and act in some new ways by the conference."

If you want to follow up with Brian about the possible conference next year, his address is Box 302, Mwanza, Tanzania; e-mail: bpolk@tan2.healthnet.org.

# UPCOMING EVENTS

## IIRR INTERNATIONAL TRAINING COURSES FOR YEAR 2000

The International Institute of Rural Reconstruction (IIRR) offers regular, international training courses on a range of topics. These courses are designed for development managers and leaders and focus on field experience and participatory approaches. They draw on IIRR's 35 years of work in development and on the experience of participants and collaborating organizations. More than 9,000 trainees from over 90 nations and around 2,500 organizations have attended training programs at IIRR.

IIRR courses are typically 2-4 weeks long. They combine interactive presentations, discussions, hands-on exercises and field visits. Many feature action planning, during which participants formulate plans to put into practice on their return home. Course topics for the coming year follow (prices are in US dollars). For details, check ECHO's home page or contact Education and Training Department, International Institute of Rural Reconstruction,Y.C. James Yen Center, Silang 4118, Cavite, Philippines. Phone: (63-46) 4142417. Fax: (63-46) 4142420; e-mail: etd-iirr@cav.pworld.net.ph.

**Sustainable Aquaculture for Small-Scale Farmers**, February 21 – March 10, 2000 in Bangladesh ($1800) for international participants and $1000 for local participants.
**Rural Development Management**, May 1 – 26 and July 24 – August 18, 2000 ($1500 + $1000 for room and food).
**Sustainable Agriculture Training of Trainers**, June 19 - July 14, 2000, India (tentative) ($1500 + $1000 for room and food).
**Community-based Integrated Watershed Management**, July 24 – August 18, 2000 ($1200 + $800 for room and food).
**Systems in Community-managed Health**, August 14 – September 8, 2000 ($1500 + $1000 for room and food).
**Food Security: Lessons from the Field**, September 11 – 29, 2000 ($1200 + $800 for room and food).
**Development and Management of a Training Program**, October 2 – 27, 2000 ($1500 + $1000 for room and food).
**Environmental Management Training on Integrated Conservation and Development**, October 9 – 27, 2000 , Nepal, (tentative) ($1200 + $800 for room and food).
**Farmer-led Extension**, November 13 - December 1, 2000 ($1200 + $800 for room and food).
**Gender in Program Management**, November 20 – December 8, 2000 ($1200 + $800 for room and food).