

**21-1 VETERINARIAN STUDENTS AT MICHIGAN STATE UNIVERSITY ARE AT YOUR DISPOSAL TO ANSWER QUESTIONS.** For the past two years, students in the veterinary department at MSU who have an interest in Third World development have been organized to help missionaries and others doing similar work when animal health problems perplex them. Dr. T. W. Schillhorn, Coordinator for International Programs in the College of Veterinary Medicine, is your contact person for the program. (I am glad for this close faculty involvement because it means the program should continue as students come and go).

They get an average of 10-20 requests per year. There are two main ways in which they have helped people to date. (1) People have written with disease symptoms and they have tried to diagnose the likely problem. A few times someone from MSU or known to them has been traveling in the area and was able to actually visit to assist with especially difficult problems. (2) They have sent literature that they believe will answer a problem, or particular articles that someone has requested.

Dr. Schillhorn says the medical school has now started a similar service. You can write him at College of Veterinary Medicine; Michigan State University; East Lansing, MI 48824, USA (phone 517/353-6489). Thanks to Roy Danforth in Zaire for alerting us to this service.

**21-1 ELECTRIC SHOCK TO TREAT POISONOUS BITES.** In response to my question in the last issue, a few have written with leads which I am still following up. I received the following account of personal experience with scorpion bites from Don Mansfield in Mali. Don works in agriculture; his wife Jo Anne runs the clinic. I hope to hear from more of you who may have personal experience in this area.

"The missionary I replaced had told me how to treat scorpion stings with a pair of 'electric shockers.' Frankly I did not believe it. Three weeks after we arrived a woman we knew came to the clinic. She had been stung on the side of her foot by a BIG scorpion of the kind that are common here. She was bent over with pain. We had nothing but an antihistamine, which did not help. I told her about the shock treatment. She was in so much pain that she was willing to try anything.

"We could not find the equipment my predecessor had told me about, but we did have a Briggs and Stratton power plant. I put the metal portion of the spark plug wire right on the spot where she had been stung, and had someone pull the rope. She jerked, but kept on moaning, hardly noticing the shock. The second pull had the same result. After the third pull she immediately straightened up, stopped moaning and began to leave. I stopped her and asked about the pain. She had none.

"In the next couple years we treated 4 or 5 more people similarly. In one case, where the sting was in a difficult spot to shock, there was still pain although it was a lot better. The others had total relief from pain, sometimes with one pull. None took more than three pulls."

**21-1 WHEN A COMPUTER SEARCH OF LITERATURE WOULD HELP YOUR WORK...** . Lew Dick, a U. S. reader of EDN, wrote, "I have just started using Western Union's Infomaster collection of databases. I also search Dialog's databases. If you or your readers have a reference request that might benefit from a database search, I would be happy to do the search. I could offer 1-2 searches a month at no charge to organizations working with Third World farmers. Other searches cost \$8-10."

If you have never done a search, let me give you a recent example. Lew read of our interest in using electric shock to treat snake bites. To limit the number of articles picked up, he requested titles and references for articles that contained both the words "electric" and "snake." The printout listed 20 articles. Three titles clearly discussed electric shock to treat snake bites. The rest had to do with electric current used in laboratory studies of snake venoms and were not relevant. We could now print out the abstract that accompanied each of the three selected articles (at extra cost). You will be seeing the results of this search in a later issue.

If you write to Lew, be as specific as possible about the kind of article you are interested in. Tell him how you will use the information and a paragraph about your work with small farmers. If there will be any cost, you can correspond as needed. His address is 2715 Marlborough Drive, San Antonio, TX 78230.

**21-2 SOME OF MY MOST HELPFUL BOOKS.** Servanthood: the Vocation of the Christian by Darrow Miller, 121 pp, Food for the Hungry, 1985. "Dear Servant of the Third World." That was the salutation in my introductory letter to each of you (if you receive EDN directly from us rather than through your organization). Quite likely you began preparing for your present work as you came to realize in your own life that you were called to serve both God and man, rather than live for yourself. It is even likely that you have taught on this subject, seeking for your students a vision-expanding, life-changing encounter with the Scriptures.

Servanthood is not like most books. To begin with, it is quick-copied and spiral bound. Each chapter begins with half a page consisting of three segments which he calls "review," "preview" (what the chapter will help you understand) and "know and do" (what personal change should result from this understanding). The rest of each chapter is an interesting mix of comments, quotes from other authors, passages of Scripture to study, and questions to think about (with space in which to write the answers if you so desire).

You can use Servanthood in several ways. The place to start is to use it yourself as a personal study guide. It then lends itself exceptionally well as the basis for a course on servanthood, perhaps in your church or for a series of talks for a visiting work team. He wrote it to encourage a group of Christian high school students from the States as they prepared for a work project in the Dominican Republic.

I phoned Darrow to confirm ordering information. He told me of another use -- training your new staff members. Food for the Hungry uses it with all their training programs. They go through it as a group, but he asks students not to fill in any of the blanks. Then after they have been overseas for a few months, long enough for culture shock to begin to set in, they go through it, this time carefully responding to all the questions. "Consistently over five years students later list the servanthood course as the single thing from their training that helped them most." He said that Bob Moffit also uses it with his organization, Harvest, and has translated it into Creole.

I will conclude with a few quotes to give a flavor for the book. "The revolutionary thing about this teaching is that these people [in a New Testament passage addressing slaves] to whom first-century culture affords no choice at all, are addressed as free moral agents. Paul gave personal moral responsibility to those who had no legal or moral status in their culture. He made decision-makers of people who were forbidden to make decisions."

[When confronted with the problem of hunger and poverty, people say, "What could I do?"]. "The trouble is with the question. 'What could I do?' is the wrong thing to ask. Before we ask what we, as individuals, could do, we need to ask the personal question of commitment -- 'Am I willing to serve?' A person can be shown a thousand needs and be given ten thousand opportunities for service; but if there is no commitment to serve, the question will always be 'What could I do?' If a person has a commitment to act and to serve, then God will indicate the appropriate service."

You may order for \$10 plus postage (\$5 Air overseas, \$1 USA) from Food for the Hungry; 7729 E. Greenway Rd.; Scottsdale, AZ 85260, USA.

**21-2 BOOK ON SUSTAINABLE AGRICULTURE IN NEBRASKA.** Dr. Charles Francis compiled several extension bulletins and newsletter articles into a 221 page book called Sustainable Agriculture, Wise and Profitable Use of Our Resources in Nebraska. He told us that, "Although most of the articles were written with Nebraska in mind, the principles will apply across a much wider area. ... Our approach of recommending reduced input is not what farmers will hear from all university extension people!" Dr. Francis was formerly director of the international program at Rodale and has worked at International Agricultural Research centers overseas. The goal is to reduce costs of purchased inputs, minimize impact on the environment and sustain production and profitability on midwest grain and soybean farms. Send \$7 (I would estimate \$12 if you want air parcel post; the book weighs 1.2 pounds) to Agronomy Department; 279 Plant Science Hall; Univ. of Nebraska; Lincoln, NE 68583, USA.

**21-3 RESPONSE TO REVIEW OF MICROHYDROPOWER BOOK (#17-5).** John and Caryl Busman wrote of their experience in Tamil Nadu State in southern India. "Although power was provided erratically and at widely varying voltages, farmers did everything possible to connect their irrigation pumps to the 'grid.' Attractive electrical rates and low maintenance costs compared to bullocks or diesel made the decision to switch an easy one. That one state ended up with a million electric pumps on small irrigation wells.

"The question is who fixes things when they break? The informal sharing of knowledge has created a whole new group of technicians. Little villages would have 4-5 people who knew the business of rewinding motors. You would see motors hauled to town on ox carts for service, with quick turn around time for repair. What is most interesting is that this has all happened within 20 years."

**21-3 DOING YOUR OWN CORN (MAIZE) IMPROVEMENT.** Bob Short in Mexico is teaching farmers to improve their own open pollinated (i. e. not hybrid) corn varieties. To be sure, the people already select the best ears for seed, but the selection is made from a pile after the harvest. Selection based on ear size only can cause more problems than you might think. This brings up an interesting story.

In the early 1900's in the United States a popular magazine, "Wallace's Farmer," and a professor at Iowa State University promoted corn competitions. These became annual events all over the midwest. Judging was based on a vision of the ideal corn: uniform ears, 10 inches long, with even rows and deep kernels shaped like a keystone. At one of the professor's talks a 16 year old boy (the editor's son) asked whether seed from the ideal ear would produce more corn than any other. "Of course," he replied, though he had not tried it. The boy's persistence made him nervous, so he collected 25 ears of the best show corn and 25 of the poorest. The highest yield came from an ear no corn-show judge would look at twice. As a whole, the highest-ranked show ears produced less than those that ranked lowest. The boy went on to school, and later formed what was to become the largest corn seed company in the world, Pioneer Hybrid, and eventually became Secretary of Agriculture.

Bob finds that even after selecting the best ears for seed, about half of the plants produce a poor ear, if any at all. Bob decided that the basic traits that he wanted were present in one plant or another in the field of "criollo" corn, though not necessarily on the same plant. He wrote, "Our method of selection is simple. The first thing we do is de-tassel the poor plants before pollination. This ensures that reasonably good plants will be the male parents of the corn. Then we select the ears to be kept for seed in the field. We take from the best plants which produce a good ear, taking into account the quality of the roots, stem, disease resistance, leaf area, etc." The important difference in this method is that good ears come from plants that are also known to be good.

"We have seen problems of in-breeding, so now recommend that seed come from fields that are at least half a hectare in size and that a minimum of 400 ears be selected. The selected ears are shelled and the seeds are thoroughly mixed together and saved for the next planting.

Bob says that they have definitely improved the quality of their own corn. It is difficult to convince farmers to change to it though because improvement is too slow to be seen quickly. A few are beginning to try it and he hopes that in 5-10 years it may be widespread.

I asked Dr. David Unander, a plant breeder on ECHO's Board of Directors, to comment. Highlights of his reply follow. "How many ears should one save to avoid inbreeding? Plant breeding texts and research suggest a minimum of 30 plants to avoid serious inbreeding, but much more is better. Unneeded seed can always be eaten. The extent of inbreeding is a function of the percentage of the population saved and will increase substantially if much less than 10% of the harvest is saved and mixed in the seed bin."

Dave suggests a way to further improve the technique. "Because differences among plants depend on the local spot in which the corn plant is grown, mentally divide the field into little blocks of 10-20 plants each (or more in a larger field). Be sure to select the best ear or ears from each of these imaginary blocks. Plants with mediocre genetic traits may have done well just because they grew in an unusually fertile spot, and plants that are outstanding may have done poorly if they grew in a poor part of the field." [I imagine this would also help to keep in your pool of seeds traits that would enable the best performance possible in those poor parts of the field].

A special merit of Bob's method is "that he has thought out exactly what he wants to select: he has a mental picture of what a good corn plant would be like for his area. This is one of the most important things to establish before beginning any breeding program."

**21-4 SOME OF MY MOST HELPFUL PERIODICALS.** Occasionally someone writes that they read EDN as soon as it arrives. Hort Ideas is in that category for myself. Gregory and Patricia Williams, the authors of this 12 page monthly newsletter, scan the horticultural literature and other newsletters, attend the most important horticultural conferences, look over advertisements and correspond with a large base of subscribers to select the most relevant information for condensing into a paragraph or two. They scan both technical and popular sources. Addresses are always provided to get a copy of the full article, place an order or write for further information. I put at least one article from most issues in my file to share with EDN readers. Here are excerpts of several examples.

Not all composts are created equal ... at least with respect to their abilities to suppress damping-off (a fungus disease which kills seedlings soon after they emerge). Composted hardwood bark, composted sewage sludge and certain other organic materials have disease-suppressing effects. Recent research at the Ohio Agricultural Research and Development Center has shown that organic materials composted at high temperatures (above 140 degrees F) can actually be conducive to damping-off due to Pythium ultimum. Only materials composted at lower temperatures are suppressive, apparently because higher temperatures kill the microorganisms that are antagonistic to Pythium. The bottom line is to get compost from the cool edge of the pile, rather than the hot center, if you want to control damping off of seedlings. High temperature composting kills pathogenic microorganisms, but it can kill some beneficial ones too.

Curved cucumbers? Here's why. Experiments in Japan show clearly that curvature is an abnormal condition due to shading or too few leaves per fruit. Cucumbers curve when they aren't getting enough food! Straight cucumbers result from early thinning to make sure the leaf area per fruit is large, and by trellising to minimize shading of the leaves.

Aluminum sulfate for slugs. Most molluscicides are based on methiocarb or metaldehyde. [Many gardeners are reluctant to use these poisonous chemicals]. Experiments at the Long Ashton Research Station in Great Britain suggest that aluminum sulfate works as well as, or even better than, these more toxic chemicals. It also costs less and is easy to apply. All commercial molluscicides were found to protect Chinese cabbage seedlings during the first four days following application, then damage increased. So frequent applications may be needed. This makes a less toxic treatment even more important. Some results suggest that aluminum sulfate acts mainly as a repellent, not as a poison, which would lead to a slower buildup of resistance. Adding aluminum sulfate at a rate of 5 pounds per 1000 square feet won't lower the soil pH very much; 10 times that rate is needed to lower the pH from 7.5 to 6.5.

Because items for Hort Ideas are selected for its primary clientele of readers in the USA, many will, of course, not be directly relevant to tropical small farms. Also, the field of horticulture includes landscaping and ornamentals, which may or may not be important where you work. If you are heavily involved in horticulture, though, I think you will become an avid subscriber. Subscriptions cost \$15 per year (\$17.50 Canada and Mexico; \$20 overseas surface; \$30 overseas air mail). Send your order to Hort Ideas; Route 1, Box 302; Gravel Switch, KY 40328; USA.

**21-4 UPCOMING EVENTS. SHORT COURSE ON SMALL ANIMAL HUSBANDRY AT ALABAMA A&M UNIVERSITY.** Dr. Steven Lukefahr, coordinator of the university's International Small Livestock Research Center, says that this intensive 5 day course will be held June 20-24 this year. There are five training modules: rabbits, poultry, small ruminants, small livestock integration (probably including aquaculture), and project development. The course has become an annual event, so even if you will not be in the USA this time, you might wish to get on his mailing list for future course dates. The 40 hours of training include lectures, field trips and hands-on work with small animals. In evenings students can use their extensive literature files, which are arranged into the same categories as the course segments. Last year 25 students took the course, many from or working in Third World countries. The course fee is \$200 (\$100 for students). Two hours of graduate credit is available if you pre-enroll for that and pay an additional tuition fee. Trainees stay in the dormitory, which last year cost only \$5 per night, and buy meals in the cafeteria.

PERMACULTURE IN THE THIRD WORLD. Two intensive 2-week courses will be offered: June 18-July 3 in Oregon and August 6-21 in Mexico. Topics include small-scale agriculture; agroforestry, reading the landscape, local food and fuel production, strategies for high altitudes, arid and tropical areas, erosion control, water conservation and soil improvement, biological pest control. Tuition is \$600, with some partial scholarships for Latin Americans. Write Third World Course; Aprovecho Institute; 80574 Hezelton Rd.; Cottage Grove, OR 97424, USA.

**21-5 BUSH OKRA FROM ECHO GREW WELL. HOW DO WE EAT IT?** Klaus Prinz wrote from Thailand, "We could not figure out how to eat the small pods. They ripened quite fast, though, so that a lot of seed was collected." Bush okra is a misleading name. It is actually grown for its leaves, which are cooked and eaten. It is called bush okra because its seed pods look a lot like very small okra pods. The scientific name is *Corchorus olitorius*, also called jute mallow and Egyptian spinach. It is a major source of food from the Middle East to Tropical Africa. The fibers are used in twine, cloth and burlap bags. The better vegetable varieties are smaller and more branched than those selected especially for fiber, but the leaves of all are edible. A related species, *C. capsularis* is the better known source of jute. Plants tolerate wide extremes of soil, are easy to grow and are resistant to drought and heat. Leaves may be dried for later use as a tea or cooked vegetable. They require little cooking. The leaves are mucilaginous (slimy), like okra, so may be offensive to some people. Plants reach over 3 feet (1 meter high) and are about 20 inches (50 cm) in diameter. [The above information is from Frank Martin's Edible Leaves of the Tropics.] Want to give it a try? We have plenty of seed (free to Third World workers).

**21-5 A GUIDE FOR BEGINNERS IN SMALL SCALE TROPICAL AGRICULTURE.** There are certain basic and important questions we receive which are so encompassing that we cannot answer them in a letter. One such question is, "I have just begun work in this country. My degree is not in agriculture, but I want to help local farmers. They know much more than I about farming in this area, but there has got to be some ways to make improvements. Where do I begin?" ECHO is selecting a few such questions and preparing what we will call "Basic Documents" that answer them well, but briefly enough that we can send the document in a regular envelope.

The above title is the first in this series, written by Dr. Frank Martin. In 11 pages he discusses differences between the tropics and the temperate climates (where many of our readers are from), nature of small scale tropical agriculture, some common problems (weeds, water, soil fertility, appropriate species and varieties, pests and diseases, nutrition, hygiene, and family economy), and finally steps toward improving small scale agriculture. Here is an excerpt:

"Diagnosis. The first step in improvement of rural agriculture is to ask the right questions so as to arrive at a diagnosis. These may include the following and others: What land is available and what are its limitations? What crops are grown, at what seasons, with what techniques and with what results? How are these crops harvested, stored, transported and used? What crop residues remain and what is done with them? What animals are produced on the farm and with what techniques? What is done with the animals and their by-products? What do people eat? How is it prepared and stored? What parts of the diet are inadequate? How does this change with time of the year? How does animal production interact with human welfare? What do people buy, trade or share? Where do they get the money? What markets exist for new products? What purchased inputs are available (tools, fertilizers, fungicides, etc.)? What is the health of the people? What are the social and economic factors influencing distribution and marketing? What is the infant mortality rate and the life expectancy? Does the diet appear balanced? From what diseases do people suffer?

"As the answers are compiled, an impression will grow of the fundamental problems of the rural community. ...Some decisions will need to be made of the most important problems to be attacked, and their root causes. The fundamental problems may not be agricultural problems."

We will send you a free copy if you are in this beginners category, or if you want to consider the document for use in training your new staff. (Those not qualifying for free assistance send \$2.00). We would appreciate feedback. It will help us evaluate when to recommend it to an individual.

**21-5 UPDATE ON MORINGA.** *Moringa oleifera*, (benzolive, malunggay, drumstick tree, horse radish tree). Moringa, together with velvet bean (last issue), have probably become the two most successful plants in ECHO's seedbank. As you read in EDN # 10-1 and 11-7, moringa tree leaves, pods and roots are eaten, flowers are loved by bees and seeds are powdered and used to purify water from murky rivers. E. g. Ross Haliburton in Pakistan wrote, "We planted moringa seeds in April and, with hand watering, they have grown well. The tender leaves from six plants have been regularly used like spinach since July. A group of Afghan refugee men (chiefs and nurserymen caring for small nurseries in the refugee villages) visited us. When they saw the moringa trees they immediately asked for seed. We believe this tree has potential as a green vegetable in refugee villages, where there is a general lack of greens, especially through the summer."

Dr. Mike Bengé with the forestry department of AID has put together a 196 page photocopied compilation on moringa which he titles Moringa: a Multipurpose Vegetable and Tree That Purifies Water. He wrote, "If you have people who would like this kind of information, just send their addresses." You can write him at S&T/FNR Agro-forestation; Rm. 515-D, SA-18; Agency for International Development; Washington, D. C. 20523.

Tom Post in Belize mentioned that his moringas are growing so he now needs recipes. There is an 18 page section in the book from the Philippines called, "Learn to Eat Malunggay." If you are only interested in the recipes, write to ECHO for a photocopy (free overseas, \$2 others). We also have seed packets.

Dr. Samia Al Azharia Jahn has written a 539 page book called Proper Use of African Natural Coagulants for Rural Water Supplies. (Chapter titles: Annual fluctuations in raw water quality, Water treatment with traditional plant coagulants, Special microbiological and toxicological studies on water purification, Cultivation of moringa trees, Introducing domestic water treatment to rural people, Practical guide to domestic water coagulation and hygienic water storage). Much of the book is devoted to moringa. French and Spanish translations are in preparation. The book is available from the Deutsche Gesellschaft für Technische Zusammenarbeit; D-6236 Eschborn 1 (bei Frankfurt am Main); Postfach 5180, Dag-Hammarskjöld-Weg 1-2; Federal Republic of Germany. The price of the book is DM35 (\$21 at current exchange rate). [They might consider you for a free copy if you write on official letterhead and need the book for your work in a Third World community]. Dr. Jahn has sent us seed for two related, more drought-tolerant species which, if we get them to produce, we will offer to you. Dr. Jahn would like to hear from you if you are working with moringa in a major way. Write in care of the Water Purification Project at the address in Germany.

Dr. Jahn sent us an article from the "East African Medical Journal" that investigated whether water treated with moringa seed powder might be toxic to people. Pounded seeds were fed to rats for 6 weeks with no toxic effects. "As the plant material acts as a flocculent [makes solids come together and settle], one might assume that most of it will get trapped in the sediment and only easily dissolvable substances will be present in the water." Furthermore, moringa "seeds are used for food; they are roasted like peanuts, pounded for tea and curries are prepared from the green pods." [I should add that I have not heard of the mature dried seeds being eaten, and at least the variety we have is quite distasteful, so I wonder if these food uses are not all for green seeds.]