EDN

ECHO Development Notes

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Edited by Martin Price

Issue Highlights

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A Word from the Editor

You will find an application enclosed for our 6th Agricultural Missions Conference November 9-11, 1999. We expect to have around 200 delegates and to cover many topics.

If you will need a visa to enter the USA, note early deadlines. Some delegates have come from a developing country thinking they would learn "modern farming techniques." Instead ECHO specializes in inexpensive techniques for subsistence and small-scale farms and gardens.

ECHO is also sponsoring a conference again in Haiti, near Cayes, May 24-28, 1999. Language will be Creole with English translation limited to our 13 headsets. See Upcoming events for registration information.

Micro-Scale Water Harvesting

By Roland Bunch (author of* Two Ears of Corn *and the director of a non-profit development group in Honduras called COSECHA)

Introduction

The following is a report on a technology that we (COSECHA) consider very promising, but that is still in its early phases. We feel it is now ready only for introduction among farmer leaders who can stand a certain amount of risk, and who will experiment with it to find better, more efficient ways of using it. In the not too distant future, we would hope (and feel confident) that this technology will become less expensive, more efficient and more varied, and will thus be capable of benefiting hundreds of thousands of the poorer farmers on the hillsides of the semi-arid and subhumid areas of the developing world.

The Definition Of The Problem

More and more, the small-scale farmers of the semi-arid and subhumid areas of the world are losing their harvests because of the irregularity of rains. During some part of what has traditionally been the rainy season, the rains cease, and as a result, the crops that depend on that rain are either totally lost or produce but a small fraction of what they would have produced had the rainfall pattern been normal. At other times, the lack of rainfall comes at the very beginning or end of the traditional rainy season, drastically cutting productivity because the growing season is shortened, thereby not allowing for proper growth of traditional crops, or perhaps any locally used crops at all.

We cannot be sure exactly why this phenomenon is becoming so common in so many parts of the world, but it is likely related to heavy deforestation (forests tend to buffer both humidity and temperatures, both of which, in turn, when buffered, would tend to make rainfall less irregular). Another possible cause of the increasing irregularity of rains is the greenhouse effect, one of whose predicted long-term effects is precisely an increased irregularity in many different climatic variables, of which rainfall is just one. If these are the major factors causing the increased irregularity of rains, we should expect that the problem will continue to worsen for many decades

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to come, because neither large-scale net deforestation nor global warming are anywhere near coming under control or being slowed down.

Thus, it is very likely that the crop losses, famines, decreased productivity and ecological damage that are directly and indirectly caused by irregular rains will worsen during at least the next three decades.

For all these reasons, three programs in Honduras have been looking for ways that poor hillside farmers can capture rainwater in their own fields and hold it there for two or three months. This water could then be used for supplemental irrigation during droughts or for extending the cropping season into the dry season.

We have limited our research to systems that cost less than US$500.00/hectare, and can be adopted and provide benefits in increments of $10.00 at a time. That is, a farmer can invest $10.00 and then increase his/her income enough to expand the system, thereby self-financing the gradual adoption of the technology on larger and larger parts of a farm. We have also limited ourselves to technologies that an individual farmer can adopt without requiring the permission or cooperation of any other farmers or the entire community. And we have furthermore limited our research to systems for use on hillsides, because hillsides provide tremendous economic advantages for such systems, making them less expensive than similar systems on flat land. In this way, we would also hope to contribute to the competitiveness of hillsides, where large portions of the rural poor in the developing world now live.

WHAT WE HAVE LEARNED TO DATE

We have been experimenting mostly with very small “micro-catchments” which can be distributed throughout much of a farmer’s field, in part to simplify the distribution of the water, in part to lower the “entry costs” of the technology to the previously mentioned $10.00, and in part to allow the collection of any water in the field that starts to flow downhill, causing erosion. The size and shape of such micro-catchments can vary depending on the nature of the soil profile, the presence of toddlers (for whom there might be a risk of drowning), the slope of the field and other factors. The most common size would be approximately 2 m in length along the contour, 60 cm deep and 80 cm wide, allowing for approximately 1 cubic meter of capacity. This quantity of water is sufficient to irrigate about 200 square meters of land once or twice, depending on the intensity of application.

We normally construct the catchments every 20 m along the hedgerow or contour live barrier, assuming the barriers are about 10 m apart (allowing 200 sq. m of land for each catchment). In this manner, a few stalks of grass or other material in the barrier can be used to provide shade for preventing evaporation of the water, and a ditch or terrace along the lower edge of the bund can serve both to catch water eroding from above and to carry the overflow from each micro-catchment that is already full on to the next one.

In many, if not most cases, farmers will have major sources of water other than just the surface of their fields. These sources will include roofs, patios, roads, paths, or natural drainage courses where rivulets of water run during a rain. These sources will probably provide most of the water for the micro-catchments, although some water would also drain from the farmers’ own fields. A small ditch from any such source(s) of water would run to the first of the catchments, and then continue along the contour (or preferably at a half-percent slope) to the others. At the end of the field or line of micro-catchments, a small vertical ditch would run down to the second line of micro-catchments.

Of course, another common source of water will be “gray water" from potable water sources that farmers are prohibited from using for irrigation. Small, ground-level home-made filters of rock, sand, and charcoal can filter out most of the soap, so that this gray water could also run by ditch into the micro-catchment system.

In the vast majority of cases, these micro-catchments must be made watertight. We are presently using either cement linings, a thin lining of cement over a layer of lime, or plastic. These solutions, however, represent much of the expense of the micro-catchments, and we hope, in time, to find ways of using dispersed clay, clay plus animal manure, clay plus different kinds of resins or tree sap, etc. Thus, in time, we hope to reduce costs, but for now, in order to get the technology into farmers’ hands so they can participate in the search for better solutions, we are using these simpler but more expensive means.

The distribution of the water would most easily be done with just one section of hose, about 20 m long, employed as a siphon, which would serve for any number of micro-catchments the farmer has. Since the water could thus only be used for crops planted below the level of the water in the micro-catchment, each micro-catchment would be used to irrigate a patch of land that would start some 5-15 m away from the micro-catchment, rather than an area of land contiguous to it.

Experiments with micro-catchments have demonstrated that the value of just one harvest of vegetables saved by one micro-catchment will often more than pay for the total cost (including labor) of its construction, especially in areas where there are no nearby irrigated fields whose produce will compete with that of the fields watered by the micro-catchments.

Many farmers would initially prefer to have just one large tank made with cement walls near the water source, and with a several-hundred-meter hose to distribute the water. This may well be the best solution for farmers who possess the necessary economic means or access to large loans, and have only one major water source, with very little flow of water down their fields. But for poorer farmers, who have multiple sources (a situation that occurs more than we originally thought), or a fair amount of infield run-off, a series of micro-catchments will be much better. In any case, micro-catchments that poorer farmers begin with should always be placed so that eventually, if and when their incomes increase, they can later incorporate larger tanks at strategic places in the system.

Of course, micro-catchments will not compete with gravity fed irrigation systems where these are available.

What We Have Yet To Learn

1. What are the cheapest, simplest, and most widely applicable ways of lining the catchments in order to make them impermeable?

2. How can we best naturally control mosquitoes, so the catchments do not become a source of disease? Using preparations of tobacco leaves, gliricidia leaves, neem leaves, or even a little oil on the water surface, are possibilities, but we need to test these possibilities on a fairly large scale and over time. Some of these possibilities would also serve to fertilize the crops being irrigated.

3. What sizes and shapes of catchments and combinations thereof will be most useful in each situation?

4. What alternative uses will compete with irrigation for this water? We assume that families without available drinking water will be sorely tempted to use it for that purpose, and animals will likely be watered from the micro-catchments, as well. Farmers also use the water to fill their backpack sprayers. How will these uses change depending on the distance of the fields from the house, the inclusion of filtered gray water, the presence and adequacy of potable water systems, and/or the size or number of catchments? In light of the fact that these alternative uses are (and well should be) higher priorities than those of irrigation, how much water will be left for irrigation? Another issue in the case of fields distant from the household would be that of the theft of water, especially for these alternative uses, although treatment of the water for mosquitoes will probably also reduce this problem.

Uses and Advantages

Of course, once a farmer has water in his or her micro-catchments, he/she will have a series of options as to its use for irrigation purposes. One use is to irrigate crops during a drought. A second use would be to use it to extend the growing season a couple of weeks or a month beyond the end of the rains. Another possibility would be to plant perhaps one quarter of the field, perhaps in patches below the catchments, in crops that would require as much as a month or two more rain, allowing for three or four irrigations. In still other cases, a farmer with water in the catchments could decide to plant very small patches of crops at the beginning of the dry season, calculating the quantity of crops planted such that they could be irrigated all the times needed with the water available. And, of course, farmers could plant perhaps half their crops after the very first rains (if the catchments filled up during the rain), figuring that even if the rainy season has not started yet, they can water the crops two or three times during the month or so before it does start, thereby getting a head start on other farmers, and getting their produce to market before anyone else.

The introduction of this technology could also have a major impact on the adoption of soil conservation technologies in many areas of the world. If farmers have a 30 to 60% chance of losing their crops to drought in any given year, most soil conservation techniques will not be economically feasible. Very few such techniques are economically viable if the benefits are reduced by 30 to 60%. With micro-catchments, a farmer could easily reduce that percentage to 5 or 10%, making soil conservation and recuperation (green manure/cover crops) considerably more attractive.

Water harvesting will also have many positive environmental and economic impacts, including less cutting of forests as existing farm land becomes more productive, less erosion, less destruction of roads, less need for bridges over temporary streams, fewer floods downstream, and increased food security and incomes for the poorest farmers.

But the technology won’t be adopted because of these factors. It will be adopted because farmers want the benefits that will accrue to them personally. And although we have only begun working with farmers on this technology, we have found it far more popular than any soil conservation or soil recuperation or even productivity-enhancing technology we have worked with to date. There have actually been cases where farmers who were not chosen berated our extensionists for not having taught them to make micro-catchments also. In thirty years of work, this had never previously happened to our extensionists here in Central America.

Ironically, thousands of development organizations, virtually all of whom say they work on the basis of the people’s felt needs, have worked for decades with soil conservation, soil recuperation, the use of fertilizers and insecticides, IPM, etc., when the people were complaining most vociferously about the droughts that were killing their crops. Now that we have, at last, quit turning a deaf ear to their pleas, the farmers are demonstrating to us once again that we will be a good deal more successful if we do respond to their strongly felt, and frequently expressed, needs.

Fly Control for Cattle

By Darrell Cox
Adapted from IPM Practitioner (September '97) and an ATTRA publication "Alternative Fly Control"

Cows will give more milk and calves put on more weight by simply ridding cattle of flies. In the U.S., university researchers found that moderate horn fly control with insecticides (organosphosphates and pyrethroids) resulted in a 17% greater weight gain in treated cattle over a three-year period. Similar increases in productivity have been reported for weaning weight of cattle (4.5 to 6.8 kg /10-15 lbs increase) and milk production (10-20% increase).

Horn flies, *Haematobia irritans*, congregate on the backs of cattle, often clustering on the midline and spreading down the sides. Sometimes horn flies settle around the bases of horns, and if the weather is extremely hot, they may move onto the belly. The horn fly feeds on blood, biting its host up to 20 times per day. Often cattle are bothered by more than 100 flies that cause a blood loss of 1 to 2 grams per day (for every 100 flies). The irritated cattle lose condition (Ed: no longer appear in prime health) due both to restlessness while beating their tails and shaking their heads and to the resulting reduction in the amount of fodder eaten. Defense reactions and the pain due to bites result in reductions in milk production of up to 50% per day and in weight gains of up to 300 grams (2/3 lbs) per day. Horn flies also are potential vectors for trypanosomes and other parasites.

Other flies, including buffalo flies (*Lyperosia* sp.) and stable flies (*Stomoxys calcitrans*), cause similar problems as the result of biting and sucking. Distribution of these flies is generally worldwide, including the tropics.

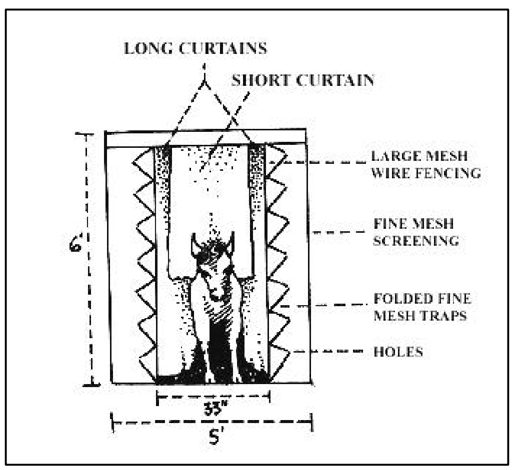
Adult horn flies remain almost constantly on the host. After the flies feed and mate, the female is ready to deposit eggs. The female oviposits into freshly dropped cattle manure. The development of the eggs passes through three larval stages and a pupae stage in the manure, before the adult stage emerges. The larval and pupae stages require a high humidity environment (fresh manure) and temperatures of 27-33°C (80-91° F). Development into adults can take up to 29 days in cool climates and can be as little as 10 days under warm conditions. Horn flies breed to enormous numbers very rapidly.

Conventional (non-chemical) control methods are focused on sanitation. The removal and stacking of animal manure and decaying hay and straw out of reach of the fly greatly reduces its numbers. Practices that prevent a high humidity environment during development will reduce fly numbers; for example, spreading out straw and hay will cause it to dry out sufficiently to prevent development of flies.

Herds that are not well managed (e.g., that receive no supplemental nutrients or are otherwise poorly nourished) show even greater responses to fly control. So one would expect that fly control would be an efficient way to improve cattle production in developing countries. However, fly control that is dependent on pesticide use will be out of the reach of many farmers. In addition, horn fly control measures dependent on pesticides are in jeopardy due to horn fly resistance to pyrethroid insecticides.

Horn flies have been controlled with insecticides in the U.S. since the early 1950s. An alternative, mechanical means of control (horn fly trap) was developed prior to World War II, but this never made its way into mainstream agriculture because of the growing use of pesticides following the war. The horn fly trap is now being promoted as an effective means of controlling not only horn flies, but also stable flies, face flies and house flies.

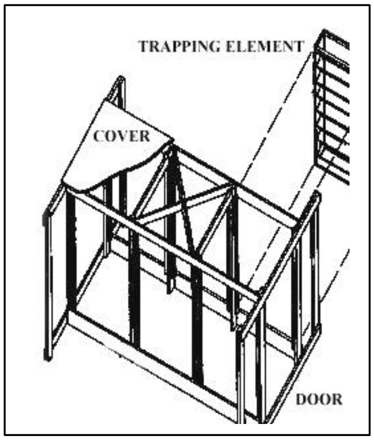
William Bruce developed the walk-through trap in 1938. In field tests done in Missouri in 1986, the trap provided 50 to 70% control of horn flies. Numbers were kept at less than the 200 per cow that has been quoted as a threshold number above which economic losses occur (note: the threshold number may be lower for animals maintained under sub-optimal conditions). The researchers in Missouri also found that horn flies migrate very little, and when flies are trapped, there is very little reinfestation from adjacent areas.



The Bruce trap is most effective where cattle must pass through it on a regular basis. The best site for placement is between a pasture area and a source of water; however, any scheme that encourages cattle to pass through the trap will work (e.g., fencing to route cattle, mineral blocks, molasses). Over time, cattle are trained to walk through the fly trap as part of their daily activities. It has been said that "cows like using the traps so much that sometimes they don't want to come out" because they learn to associate the trap with a lack of biting flies.

Details of the Bruce trap are quoted below, but it will be difficult to build from just a verbal description. If at all possible, obtain the blueprints at the address given at the end of this article.

"The trap is of simple construction and can be built at relatively small cost. The framework of the trap is 5 feet wide, 6 feet high and 10 feet long (1.5 x 1.8 x 3 m). The base of the frame is made of 2 x 8 inch (5 x 20 cm) lumber, the remainder of 2 x 4 inch (5 x 10 cm) lumber. All pieces are securely bolted together with 3/8 inch (9.5 mm) bolts. The top is made of any inexpensive lumber. The passageway through the trap is 33 inches (0.8 m) wide and approximately 6 feet (1.8 m) high, and is lined along the sides with heavy large-mesh wire fencing. On each side of the frame, set side by side behind the wire are three screen trapping elements, each 37.5 inches (0.95 m) wide, 10 inches (0.25 m) deep and 5 feet (1.5 m) high. These screen trapping elements are made of 18-mesh, galvanized screen and are of a modified tent-trap construction – i.e. the screen of the trap facing the passageway is folded in a series of z's. The apertures through which the flies enter the trapping element are 3/16 x 3/8 inches (5 x 9.5 mm) and are placed ¾ of an inch (19 mm) apart along the inner acute angles of the z's. Each trapping element is provided with a door through which the dead flies are removed.



"Two sets of curtains and six weighted strips are used to dislodge the flies from the cattle as they pass through the trap. Each set of curtains consists of three pieces of carpet [Editor: Or other appropriate materials such as feed sacks]--two pieces 20 inches x 6 feet (0.5 x 1.8 m) and one short piece 24 x 30 inches (0.6 x 0.8 m). The two long pieces of one set are attached to the frame at the top and sides of the passageway between the first and second pairs of trapping elements. These long curtains, being fully one-half as wide as the passageway, meet at the center. The short piece is suspended from the top at the same place of attachment as the long curtains. This serves to brush the flies from the backs of the cattle and also to darken the space above the animal, which is opened by the parting of the long curtains. The other set of curtains is installed in the same manner between the second and third pairs of trapping elements. The weighted strips are made of carpet 4 inches (10 cm) wide and about 6 feet (1.8 m) long and are suspended at irregular intervals from the top of the trap between the two sets of curtains. The weights consist of small pieces of lead, iron, or other heavy metal weighing at least 4 ounces (113 g), which are riveted to the strips near the lower end. These weighted straps flap about the body and legs of the animal as it passes through the trap and dislodge flies not reached by the curtains.

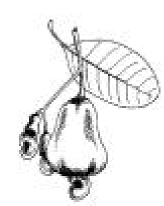
"It will be noticed that the placing of the z-shaped trapping elements along the walls of this trap takes advantage of the tendency of horn flies to fly outward and upward when they are brushed from an animal. Stable flies also rarely fly directly upward. The construction of the trap is such as to allow as much light as possible to enter, particularly on the side walls of the entrance section. This feature prevents the escape of any great numbers of flies through the entrance opening."

Blue prints of the trap are available from the University of Missouri for $5 plus $2.50 shipping (Agricultural Engineering Plan Service, Room 205, Agricultural Engineering Dept., Univ. of Missouri, Columbia, MO 65211, USA; specify plan 1-904-C6 "fly trap"). They are also on their web site at http://muextension.missouri.edu/xplor/miscpubs/mx1904.htm.

A couple of notes of explanation are needed here. When flies are brushed from the backs of cattle they move toward the screens because they are attracted to light. The top to the trap tends to be dark because the curtains and carpet pieces are hung from this area. The z-shaped trapping elements work on the basis of the "inverted cone" principle. The traps force the flies to crawl from a large opening (acute angle of the z) through a small one (holes made in the mesh where it is bent to form the angle). Once the flies have passed through these holes the cone now faces the wrong direction. Not many flies will find the holes and escape.

ECHOES FROM OUR NETWORK

ADDITIONAL COMMENTS ABOUT CASHEW



In the last issue Brian Hilton shared his experience with cashew trees in Mozambique. For this issue we asked Brian to expand on some of the issues raised there. Then we follow with a letter that Ian Wallace in Guinea-Bissau wrote us seven years ago about some of the problems with the cashew work there. It confirms some of the warnings that Brian raised in the last issue.

Interview with Brian Hilton, Mozambique.

Editor: You said you would not recommend planting cashew in an area where there was no processing industry. What is involved in starting a processing plant?

Brian Hilton: There are basically two types of processing systems for export quality kernels. The first are large mechanized factories employing several hundred people. These systems require a very expensive capital input, huge warehouse space and are strictly for large investors.

There are also several types of mini-processing factories which cost US $25,000-$50,000. These factories process 500-1,500 kg (500-1,500 lbs) of raw nuts per day. The mini-factories employ more people (25-200 people depending on the factory) per ton of processed cashew than the highly mechanized factories. Because humans are better at separating the nut from the shell than machines, kernel breakage is less with the mini-factories and they can be quite profitable. Several companies make the mini-plants including Pierce in Brazil and Chirag in India, and there is even a small engineering firm in South Africa. Obviously even these mini-factories are not for the small investor.

One of the biggest costs is stockpiling cashew to keep the mini-factories going. The cashew-harvesting season is only about two months long. So if you want to keep the plant going for 200 days per year, the smallest plants would require a stock of about 100 tons of raw cashews.

For quality seed it is important to remove the poisonous liquid in the hull. This is usually done by a hot oil bath or drum roasting.

Editor: What is involved in marketing cashews?

Brian: I've never done the marketing of the processed nuts, but owners of cashew plants say it is not difficult. Buyers exist in South Africa, Europe and the USA. You also need to deal with export licenses, taxes, foreign currency exchange, etc.

Editor: You mentioned that farmers might want to create marketing associations so they could sell in quantity and negotiate a better price. What has been your experience with these?

Brian: Associations can be an effective way of obtaining higher prices. It is a very costly and laborious process for buyers to buy small quantities of cashew from individual farmers. By pooling their cashew harvest together and selling in bulk, farmers can get a higher price. Such associations usually have a quality control officer to do some elementary quality control. This can save buyers additional expenses at the factory. We are working to get buyers to recognize the savings and to pay a further premium to the farmers' groups who ensure quality cashews.

Editor: You mentioned that farmers were encouraged to prune lower branches to help control powdery mildew. How does that help?

Brian: Powdery mildew likes cool, humid conditions and succulent growth. It does not tolerate high temperatures or high ultraviolet light concentrations. So pruning lower branches to let in more sunlight seems to be helpful. Powdery mildew can reproduce in 48 hours, releasing millions of spores into the atmosphere. One farmer alone will not significantly reduce the inoculum in the air by pruning. But it has been proven that many farmers pruning in adjacent areas can significantly delay the initiation of the disease. Those not living on the East African coast may not have to do this since powdery mildew is generally not a problem elsewhere.

Editor: Is the fruit a valuable commodity?

Brian: In some countries, like Brazil, cashew "apples" enjoy a ready fruit market. [Editor: It is such a popular drink in Brazil that it is available as a canned beverage.] In Africa cashew apples are used locally as fresh fruit, or used in jam or alcohol production. But it is highly perishable and its use is severely limited. In Tanzania the smell of rotting cashew apples is a common odor in the village during cashew harvest season. *End of Interview*

Letter written in 1992 by Ian Wallace in Guinea-Bissau.

"Vast areas of virgin bush have been cleared and planted with cashew trees in the past 10 years. Certainly the crop has not fulfilled all that was expected of it. Perhaps the expectations were too high, or too little care was given. The initial stages of raising the trees is so straightforward that there is a tendency for people to sit and wait for the tree to "do its stuff," with many orchards remaining uncleaned.

"The crop is unreliable and very little is processed locally. That which is processed locally is of poor quality. The majority of the nuts are exchanged by the government for rice and then shipped raw to foreign processing centers. The true value of the crops remains unrealized since much of the profit is only added after processing. We have also seen a disastrous fall in rice production because it is easier to collect cashew nuts and exchange them for imported rice than it is to work the rice fields. This is obviously a fault of the exchange policy, but it is difficult to see how else the farmers could see value for their cashew nuts as there is no other market and the government has no other means of paying.

"It is indeed a labor intensive crop. Harvest time involves an army of workers, many of whom are children from the age of six years on up who are taken out of school for that purpose. It is rare to see men involved in the harvest.

"Cashew has greatly aggravated another social problem—drunkenness. The squeezed fruit juice ferments quickly, without the need for people to do anything, making a strong alcoholic drink in days. The cashew wine is available in far greater quantities than palm wine. Cashew season sees a marked increase in drunkenness."

The Papaya Seed Stomach Cure

Jim Ardill, SIM Ethiopia Development Administrator

We asked Jim to expand on what we wrote in the last issue on this subject. "Some of my co-workers also use papaya seed for stomach ailments. It is part of traditional Ethiopian medicine for stomach worms, especially tapeworms from a raw meat delicacy. I've not analyzed stool samples, so have no scientific evidence. A one-teaspoon dose for 3-5 days usually handles most cases of worms. I use papaya seed for several reasons; it works, it's free and I've read that prolonged use of the medicine 'Flagyl' has been known to cause cancer. It is fun to prepare my own medicine from God's fruit orchard and experience healing through it.

"It is not necessarily easy to overdose, but important to keep to one teaspoon only.

By the way, I'll be looking for gelatin capsules when I reach the US, so I can prepare the seeds in these capsules, making them so much easier to swallow. "

Performance of Jack Bean Seed that ECHO Sent Us.

Dave Crist, Thailand

[Editor: I sometimes wonder if someone opening a packet containing just a few very large seeds may question whether anything worthwhile can come from such a small accession. This is a good example of how quickly seeds can multiply.]

"Of the 8 seeds that were sent 4 were planted in a place where sunlight was restricted to about 4 hours a day. These gave very few pods. The 4 others got more sunlight and we got a harvest of 185 seeds so far. We have planted 160 of these seeds at our demonstration site and they are growing vigorously. With this second harvest we hope to promote the use of jack beans among the farmers who have infertile plots of land."

[Editor: Assuming his second planting yields at least as well (46 seeds per plant), I calculate that he could have 8,510 seeds in a few months and over 390,000 the next year. So never underestimate what can happen from a small packet of seed.

It might be wise for someone in the midst of a big grow-out of a new crop that is very promising to get more seed from ECHO, or better yet, another source. This variety of seed sources will provide more genetic diversity in what is ultimately released to the farmers. That diversity will, in turn, increase the chance that at least a portion of the plants might have resistance should a new insect or disease appear.]

BOOKS, WEB SITES & OTHER RESOURCES

Two Books on Experimentation by Farmers

Reviewed by Darrell Cox

Development organizations are increasingly interested in the results of experiments done by farmers themselves. This reflects a growing respect for their "indigenous knowledge." Below we review two recent acquisitions to ECHO's library on the topic of farmer experimentation.

Field Experiments with Forages and Crops: Practical Tips for Getting it Right the First Time

Manual published by Australian Centre for International Agricultural Research (ACIAR), 1997.

This 48-page manual provides the basics of how to set up a replicated field trial with randomized plots. It is well written and is in a format that would allow each of the eight chapters to be used as a lesson in training extension staff or village agriculture workers on the methodology. There are numerous illustrations that are very useful for conveying some of the key ideas in each chapter. The manual includes a chapter on data collection; however, nothing is included on how to compile, analyze and interpret data. I imagine the authors decided these topics went beyond the scope of the manual.

The manual is the first in a series that is being prepared by the Forages for Smallholders Project in Laos with the support of ACIAR. The topics of the next three booklets will be: forage species with broad adaptation for SE Asia, forage agronomy, and participatory approaches to developing agricultural technologies with farmers (all to be published in

1999). Order from Forages for Smallholders Project, P.O. Box 6766, Vientiane, Laos PDR; email: p.horne@cgiar.com; or from ACIAR, GPO Box 1571, Canberra. 2601 Australia. Fax: 61 2 6217 0501 E-maillynch@aciar.gov.au. It is free for development organizations.

Farmers' Research Practice: Lessons from the Field

Book published by Intermediate Technology Publications, 1997

All forms of interaction that combine the knowledge and skills of farmers with those of outside facilitators to creating improvements that are sustainable in farming systems are collectively known under the guise of Participatory Technology Development (PTD). The editors of this book have collected 17 case studies of recent or ongoing PTD programs that have attempted to build genuine collaboration in agricultural development. They have categorized these case studies into four groups based on their general approach to supporting farmers' research: 1) grasping (seeking to learn from) farmers' research, 2) adding technical options, 3) improving experimental design, and 4) sustaining the process (developing linkages so that agricultural innovation can continue without the presence of external PTD facilitators).

The scope of the case studies is wide both topically and geographically– from design of tillage equipment to cassava breeding and from Asia to South America. A FARM-Africa project in Ethiopia provides an example of a program adding technical options. This case study "recounts how it deliberately built on indigenous knowledge to promote the local development of appropriate agricultural technology. Farmers from different parts of the project area were brought together for workshops. Here, the farmers told each other what they had observed about the behavior of the mole rats which destroy their staple food crops and discussed how their own knowledge could be used to control the pests. This led to the farmers' experimentation with various types of traps. In this case, merely giving farmers the opportunity to think through a problem together stimulated their inherent skills in technology development."

Order from Intermediate Technology Publications Ltd., 103-105 Southampton Row, London WC1B 4HH, UK; e-mail: orders@itpubs.org.uk; ISBN 1-85339-392-4; £9.95 (add 25% for shipping outside of Europe).

UPCOMING EVENTS

Integrated Development for Water Supply and Sanitation

25th WEDC Conference, Ethiopia, 30 August-3 September 1999

The principal objective of WEDC conferences is to enable those involved in water, sanitation and hygiene projects and programs in low-income and medium-income countries to meet, discuss their work and learn from one another. Much of the conference program is devoted to discussion amongst specialist groups. Encouragement is given for everyone to comment and ask questions about presented papers, and to talk about their own experience. Topics that are likely to be discussed include water and wastewater treatment, rainwater harvesting, on-site sanitation, hygiene education, guinea worm eradication, and community management. For more information, contact: Prof. John Pickford, WEDC, Loughborough University, LE11 3TU, UK, j.a.pickford@lboro.ac.uk, fax (44) 1509 21109; or Getachew Alem, Catholic Relief Services, PO Box 30361, Addis Ababa, Ethiopia. Fax (251) 1 654450 E-mail crs@telecom.net.et

ECHO Conference for Christian Agricultural Workers in Haiti.

May 24-28, 1999. Rev. Franz Clotaire with SEED Ministries (Box 15665 West Palm Beach, FL 33416 or B. P. 32, Les Cayes) is chairman. His phone in Haiti is 86-0941. In Haiti obtain registration materials at SEED Ministries, Warf Masse, Okay, Biro MEDA, Delmas et Rte Aeoport, Potoprins; Convention Baptiste D'Ayiti, Rue 15-A, Okap; Globe Missionary Evangelism, Bordes #34, Jeremie or Eglise Methodiste Libre Ruelle Dupiton #12 A, in Gonaives. Or e-mail Franz Clotaire at frantzseed@maf.org