In Honduras, there was a farmer who was an exemplary CIAL member. He was the leading CIAL spokesman, frequently called upon to explain the methodology to outsiders, to discuss the trials, and to help form new CIALs. This farmer played a leading role in the establishment of a watershed committee and in the annual national CIAL meetings. He was known locally as *el doctor* because of his ability to diagnose and analyze agricultural problems. And one day he abandoned his replication of the ongoing group experiment without a word of explanation. His action stunned the researchers monitoring the CIAL. Their “star performer” had let them down, without even a word. Worse, he had harvested all of his own maize crop, which encircled the replication site. What had gone wrong? The answer was that they had forgotten that *el doctor* was also a poor farmer with a family to feed. The CIAL experiment was ready to harvest just as he was about to plant a tomato crop with a neighbour. He made time to harvest his own maize crop, but the experimental plot required careful weighing and evaluation — and it would not feed his family, unlike the tomato crop — which was waiting to be planted with the aid of a rather impatient partner. However, he was too ashamed to admit his decision, so he said nothing and, by doing so, jeopardized a CIAL experiment.

This cautionary tale is taken from a 1999 report submitted to Canada’s International Development Research Centre (IDRC), which supported the Honduras project. It serves to
highlight the difficulties and the need for extreme sensitivity when attempting to involve resource-poor farmers as active partners in participatory agricultural research. Yet, despite such small setbacks, the CIAL program has been, and continues to be, a hugely successful experiment in action research, including participatory plant breeding (PPB).

Begun in the 1990s by the International Center for Tropical Agriculture (CIAT) the CIAL program has expanded rapidly. Today there are about 250 committees in eight countries of Central and South America. They involve thousands of men and women in the hillside communities of the region, and they are producing results that are surprising the scientists in the formal research system. In addition to Honduras, IDRC has directly and indirectly supported CIALs in Colombia, Ecuador, and Nicaragua.

How the CIAL works

The CIALs bring farmers and researchers together in a process of joint experimentation and learning. High on the agenda of most CIALs is evaluation of improved local crop varieties and testing new varieties for suitability in their location. Many of the alternatives tested by a CIAL originate within the local farming community. Others come from the formal research system. Or there may be a mixture of the two. Management of pests, diseases, soil, water, and nutrients are also significant concerns for the committees. The staple food crops — beans, maize, potato, and cassava — account for more than 80 percent of the on-farm research.

The people of the community choose the CIAL’s research topic at an open meeting, basing their decision on criteria such as chances of success, the number and groups of beneficiaries, and the likely costs of the research. Then comes the planning stage, when CIAL and other community members decide on the objectives of the experiment, as well as the treatments and control, the materials and methods to be used, the inputs needed, the data to be collected, and the criteria for evaluating results.

The experiment itself is usually carried out with the help of other members of the community, and once it is completed the CIAL meets with the facilitator (perhaps an agronomist from a local NGO) to evaluate the data collected. In analyzing the results, CIAL members ask “What have we learned?” This stage in the process is especially important when new crops fail or the experiment produces unexpected results.

Finally, the CIAL presents its activities, results, and expenditures at one of the regular open meetings of the community and seeks feedback. The CIAL may also make recommendations based on the results, but it is for the community to decide whether the CIAL should continue with the experiment, switch to a new topic, or even cease its activities altogether.

The Honduras experience

In Honduras, the CIAL concept was introduced by the Participatory Research in Central America (IPCA), a project established by CIAT with support from IDRC, and coordinated through the University of Guelph, Canada. From the beginning, the IPCA team was aware of the importance of trying to involve farmers at the outset in an experiment likely to show some success, fearing that if farmers continually experienced failure they would lose confidence in their own as well as the agronomists’ ability to look for alternatives.

They need not have worried. In a relatively short time, the IPCA agronomists were reporting that it was “not uncommon” to find that the farmer-bred varieties out-performed improved germplasm from the formal research system. Farmers learn through practical experience in the CIAL, which becomes, as one member put it, “a little school for learning.” This reflects the fact that the CIAL process goes further than just research and becomes in effect a field school.

The same CIAL member continues: “In the CIAL we have learned to sow maize, to give as much priority to improved varieties as to local ones, because amongst the landraces there can be good varieties. We have learned to select, to store seed, to identify characteristics, to use chicken manure, and to collect weeds and leave them between the rows to stop erosion.”

Through participation in the CIAL, farmers have learned to be curious and to assess different options for dealing with
their problems. For example, in Honduras farmers typically refer to all bean diseases and pest infestations as hielo (literally “ice”) without any attempt to distinguish the different causes and symptoms. But CIAL members now differentiate between bean diseases and pest symptoms and are learning some preventative methods.

As one eloquent farmer described his perception of this change: “We were almost blind as far as agriculture goes. Now we see things — our minds have been woken up. We have learned about agriculture and the process of managing research. It is worth the effort to work based on such a process. Research has helped me. Now I work in an ordered fashion. I plan, I figure out the costs, I do a diagnosis and say to myself, ‘I’m going to plant maize and not beans this time around’. Before I didn’t rotate my crops. But the brain is a little fresher these days because of the CIAL books.” (The books are training manuals provided by IPCA.)

In 1998, IPCA was instrumental in helping to create a federation of CIALs across Honduras. Known as ASOCIAL, the federation comprises four regional chapters supported by a committee of technicians from local organizations. Each chapter supports miniprojects through small project loans to the CIALs, to be repaid with interest at the end of the project. The ASOCIAL also organizes an annual meeting of CIALs, the encuentro, when farmers share the results of their research.

The Nicaragua experience

In 1997, a research team from CIAT, in cooperation with staff from the local Farmer-to-Farmer Program, introduced the CIAL to four communities in the mountainous region of Matagalpa, Nicaragua, as part of a broader natural resources management research project supported by IDRC and the Swiss Agency for Development and Cooperation (SDC).

The involvement of women in these CIALs was a sensitive issue, to the point where one committee was composed entirely of women. Noemi Espinoza, a researcher with CIAT, explains that women welcomed the opportunity to participate, but this did not always sit well with the men “The women think that being part of a CIAL allows them to show their skills, capacity, and potential, and in this way they are able to contribute to solving the problems of their community. They find in the CIALs an opportunity to get to know other community members, and to integrate themselves in other social networks beyond the core of the household routine.

“However, some women were worried about the reaction of their spouse; whether or not he would like the idea that she becomes part of a CIAL,” Espinoza adds, and in some cases the men objected to women’s participation. “Some men think that organizing is men’s role, and that women do not have the time to participate or to become organized. But not all men are so negative. Some see the participation of women as an opportunity to strengthen women’s skills.”

The communities evaluated the first year’s overall results positively, and the following year, members of the four CIALs, together with the CIAT team, organized a watershed-level meeting to share insights, plan for future activities, and identify training and technical support needs. Several farmers from other communities also attended, and subsequently a number of them took part in the second national CIAL training course. Four new CIALs were formed in the area, and two of the trainees (one man and one woman) became para-tecnicos, or junior technical staff. These two assisted the newly operating and existing CIALs, and in 1999 helped to establish two more CIALs.

Part of the Piedras Largas CIAL in Matagalpa province, Nicaragua, two farmers sow a local bean experiment.

Building bridges

Certainly the CIAL process is not perfect. Most CIALs go through up and down periods due to turnover in membership, people’s involvement with more immediately rewarding projects, and irregular technical support. Involvement for women is sometimes still difficult. But overall, as the experience of farmers and researchers in Honduras and Nicaragua demonstrates, the strengths of the CIAL system far outweigh any weaknesses.

In Matagalpa, several committees have since moved on to experimenting on a larger scale, addressing new aspects of problems in their communities such as soil fertility. A number of new farmer-leaders have emerged, including several women, and, where possible, CIALs are linking to each other to exchange ideas and results within the watershed and beyond — through participation in the annual CIAL meetings in Honduras, for example. They also are building bridges to formal research and technology organizations.

This case study is one of a series of six on participatory plant breeding written by Ronnie Vernooy, senior program specialist at IDRC, and science writer Bob Stanley.
Why diversity matters

Modern agriculture rests on a precariously narrow base. Genetic erosion could threaten the future food supply if anything should happen to reduce the effectiveness of the high-yielding varieties that much of the world has come to rely on. Crop breeders tend to rely increasingly on a narrow set of improved varieties, making it more and more difficult to broaden the diversity base. In the past, researchers have been able to depend on farmers to retain sufficient crop diversity to provide the “new” genetic material they need, but homogeneous modern agriculture threatens that source of genetic diversity, and thus threatens both local and global food security.

The high-yielding varieties developed by the formal research system are often high-maintenance varieties. They may require regular applications of fertilizer and other inputs. These constraints effectively put them beyond the reach of millions of small-scale farmers who cannot afford the high-priced seed and fertilizer. Many of these farmers reject the plant breeders’ offerings because they simply are not designed for marginal farmland — they meet neither the farmer’s needs nor local preferences.

Rethinking conventional breeding strategies means above all recognizing the key roles of farmers and their knowledge and social organization in the management and maintenance of agrobiodiversity. Recognizing these roles is the basis of the approach known as PPB. Simply stated, the aim of PPB is to ensure that the research undertaken is relevant to the farmers’ needs.

Sustainable Use of Biodiversity

IDRC’s Sustainable Use of Biodiversity program initiative looks at ways to conserve biodiversity by promoting its sustainable use by indigenous and local communities. It emphasizes research approaches that are sensitive to gender issues and inclusive of indigenous knowledge and culture, and seeks ways to inform policies with these approaches.

For more information

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References

For an overview of the issues raised in this article, read Seeds that Give: Participatory Plant Breeding, by Ronnie Vernooy (IDRC 2003) and browse www.idrc.ca/seeds.

For more information on agricultural biodiversity in general visit the Web site of the International Plant Genetic Resources Institute, www.ipgri.cgiar.org, or see The State of the World’s Plant Genetic Resources for Food and Agriculture (FAO 1998).