

ZIG-ZAG in Nicaragua

A Participative Trainingsystem in Increasing Demand



Group of extension workers practising in a nursery.

by Cora Schibli¹

In Nicaragua, agricultural extension workers write up their own microprojects to familiarize farmers with integrated production. During a 2-year educational project by CATIE-MIP², extension workers are trained in the areas of integrated production and microproject development while performing alternating work both in the training facility and in the field. This training program, which became known under the name of Zig-Zag, has proven itself and will be presented here using coffee cultivation as an example.

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² CATIE-MIP „Centro de agricultura tropical de investigación y enseñanza- manejo integral de plagas“ is an international institution that deals with agricultural research and education in subtropical and tropical regions and also runs projects in various countries in Central America. The Project for increased use of Integrated Production (MIP) is located in Nicaragua.

Why are we participating?

“We noticed that we have been more motivated and felt more responsible for our work since we started participating in the CATIE-MIP training project,” said Gaston Schneegans, an extension worker of a small NGO in Carazo called AGRODERSA. “It’s more satisfying if you can implement a project that you yourself devised. You’re interested in sticking with it to the very end so that you can learn about and use the tools of self-supervision. That way everybody can figure out if what they did was a success or a failure and continuously improve their work. That gives us more self-confidence. You really need a great deal of self-motivation, but the same holds true of the whole concept of integrated production which is what we’re teaching. There, the focus is also on training your own thinking capabilities because natural conditions are always going to be different wherever you are, which means that there will never be one, universal solution.”

1. The ZIG-ZAG training system used by CATIE-MIP

The training program in the CATIE-MIP project has a 10-year history. Integrated production training was developed to be participative training using Nicaragua's four most important crops: coffee, banana trees, vegetables and basic foods (beans, corn, millet). In coffee farming this currently looks something like this:

At the beginning of the vegetation cycle there is a 3-day nation-wide introductory workshop on integrated production and the methodology used when working with the farmers. There, the latest topics are introduced and theoretical knowledge is presented along with many practical exercises both in the classroom and on the field. The participants' tools are a manual and notebooks.

There is an additional two-day workshop during the cycle during which extension workers learn how to develop, monitor and then evaluate their own micro-projects.

The core element of this training program is made up of the regional meetings spread throughout the whole year. There are five meetings each consisting of two

days of coursework in each different climactic region. Each meeting will take place at a different vegetational stage of the plant so that the actual problems in the fields can be integrated into the class.

The extension workers work alongside the farmers after every meeting, applying what they have just learned. Based on the data and information obtained from the field, they calculate expected pest infestation, diagnose weeds found, inventory shade trees and evaluate the health of the plants on their plantation.

In the methodical portion, extension workers practice participative training with the farmers. The central unit that performs integrated production techniques is the family (adults, children, older people). Many practices are worker-intensive, meaning that they must be performed repeatedly and mechanically. These include clearing the plants from any leftover coffee beans. That can be done easily by various members of the family. This prevents any other additional expenses from arising and instead utilizes the family's own un-exploited workforces.

Individual microprojects are also presented at each meeting and, on this basis, the current phase of project development (planning, monitoring, evaluation) is discussed within the group.



ZIG-ZAG schematic diagram: Five phenological plant stages during which the meetings are organized (leaf loss / flowering/ budding of new leaves / fruit formation / ripening of fruits).

Meeting preparation and organization

Various groups participate in the organization and preparation of extension worker meetings:

- The staff of the CATIE-MIP program which is trying to step back,
- representatives of regional groups where decision-makers of the NGOs and institutions, whose extension workers participate in the training program, meet and coordinate,
- the national Coffee Group where professionals and specialists from universities, coffee institutes and technical colleges form a forum,
- the Ministry of Agricultural Technology also participates in certain regions where a large number of governmentally-employed extension workers attend the workshops,
- and, in areas where they are available, former participants also attend.

A group of these specialists is put together in each region to prepare and modify the workshop curriculum that they worked out to fit regional characteristics. There is also a course cycle of four annual meetings for these groups in charge of preparation where selected topics and the latest research results are presented and methodical aspects and project development can be worked on.

2. Hands-on details

Requirement

Anybody interested in participating in this training course must meet a few basic requirements. The extension workers must be employed by an organization and work together with at least one group of farmers that is not already being financed by another sponsor for the same purpose. They must have the support of their superiors and be willing to accept project development as a part of their training.

Goals of this training course

The goal of this training course is to provide the extension workers a foundation and the tools needed to use participative methods to implement integrated production on coffee plantations with farming families. Another goal was formulated in 1998. The extension workers are to draw up, implement and evaluate their work as a project.

Extension workers implement their own projects

Every assisted group of farmers is really its own microproject and is developed independently by the participants. During the second year of training, they are able to plan their own microproject on behalf of their organization or institution, separate the financial element from the actual contents of the project and, with the necessary signatures from their superiors, submit the project to the CATIE-MIP program.

They follow the progress of their projects on a regular basis by visiting colleagues (on a workshop day) and then discussing this in the group at the next meeting. If necessary, they make corrections and, along with the group of farmers and using various self evaluations, they evaluate the project at the end of the cycle so that they can submit a project continuation proposal for the next year.

Persistent repetition until it works

A few basic ideas are needed to get started in integrated production:

1. How do the ecosystems work?
2. Who are the biological participants in that agricultural area?
3. What is natural pest control?
4. Which ones are strategies for pest management?

That means that individual insects, small animals and weeds are precisely identified and observed. Their behavior and numbers are studied and matched to plant symptoms. Extension workers learn how to regularly record data about the appearances of pests and the phytosanitary state of the coffee plants and to then pass this information on to the groups they are in charge of.

These data are compared at the course meetings. Projections are then made to calculate the infestation by a specific type of pest at a specific point in time. The last step is then to specify the damage threshold and discuss the possible solutions.

These calculations are quite difficult for functional alphabets to apply and the forms used are quite complicated. A considerable amount of practice is necessary before these can be used to make any sort of damage prognosis. However, this is an indispensable basis for independent decision-making and to avoid dependence on recommendations made by the chemical industry. Each meeting provides an opportunity to practice, either on the plots in front of the

classroom or using the figures from the monitored groups of farmers.

Successes are experienced as early as the second and third year. The calculations then no longer take up the majority of classroom time. At that point, more attention can be focused on discussing which practices are best suited to limiting the economic damage.

Exchange between participants

At the extension worker meetings, groups work on the newly acquired topics whereby each participant contributes his or her experience with the farming concept they are using. This familiarizes participants with different practices and gives them an opportunity to judge them.

The extension worker's work with groups of farmers is monitored by other extension workers in the same course on at least three different course days. The purpose of this mutual monitoring is to judge whether the material learned was implemented correctly and serves as a learning experience for both parties.

Feedback from the home base

At each of their meetings, the participants present two one-day workshops that they held for their groups of farmers as well as their results. These are current topics that were dealt with in the last session which the person making the presentation has modified and adapted in an especially creative or successful way while taking the specific situation into consideration. This gives participants in the classroom new encouragement and ideas from their colleagues. These classes also serve to praise and improve the form and content of other participants' workshops.

Coaching by specialists

Another way of evaluating success is guaranteed by the staff of the CATIE-MIP project or specialists from the Universities that are participating in the preparatory groups and that drafted the training course curriculum. All participants have an opportunity to ask an expert to visit once or twice and monitor their own workshops. During these visits, video recordings are

sometimes made so that they can be played in the participant group. This allows the group as a whole to evaluate the methodology and content of the workshop given.

3. Results worth seeing

Increasing yield without additional pesticide use

The coffee berry borer (*Hypothenemus hampei*) represents the most significant pest to small and medium sized farming families who use very few agricultural input. In integrated production, two methods can greatly reduce the occurrence of these insects: After harvesting, any coffee beans left hanging and lying on the ground must be gathered together and burned to deprive the borer of food. Ideal conditions must also be created for the reproduction of the berry borer's naturally occurring enemies (a fungus and a parasitic wasp). If the 10,000 families who indirectly learn from this project use these two methods on their coffee plantations, an area of 30,000 hectares would be affected which would mean a reduction from 3% to 1%³ in the number of fruits damaged. That equals an increased Gross Economic Benefit of US\$ 1.008 mill. per year or an increased Gross Economic Benefit of US\$ 100⁴ per family. That is an amount that cannot be underestimated for a rural Nicaraguan family living a predominantly self-supplying life.

A tendency toward yield stabilization has been observed in the families that have applied integrated production techniques over a number of years. And that not only holds true for coffee, rather for other crops, as well. That means that the effects of natural catastrophes or economically relevant political decisions (a change in the external factors) no longer have such the huge downward impact like they used to have. These are empirical observations that should be substantiated by studies currently in progress.

ZIG-ZAG disseminates knowledge with long-term effects

After completing the two-year course, the progress these extension workers have made is obvious. They can confidently calculate pest infestation in a reasonable amount of time and know exactly what level it can reach and when before it causes any economic damage. They can recognize symptoms of disease in plants, identify pests and their characteristics and know how to take crop-specific, mechanical or – more seldom – biological steps to fight them and keep them in check.

³ From: Programa Regional CATIE/MIP-Agroforesteria (NORAD), Managua, Nicaragua, April 1998

⁴ These calculations are based on a coffee price of US\$ 120 per 100 kilo of coffee oro, a presumption made in 1998 that was to hold true for the next five years. In the meantime it has fallen to about US\$ 50.

In at least 50% of the farming families trained by the extension workers, pests in crops are systematically counted⁵. They know twice as much about the causes of plant diseases and biological pesticides as other farming families. These courses had an even greater impact among women since the former participants differ from the women without this training by the factor 3⁶.

Increased feeling of personal responsibility

The extension workers feel more responsibility toward a project that they themselves devised and are more ambitious to correctly and successfully complete it than they would be if implementing a project devised by somebody else, as has been the case in the past. This project work involves a certain amount of extra effort, but this is gladly accepted by the participants since it holds such excellent learning potential. Monitoring by the other extension workers, evaluations by the group they take care of and self-evaluations have a self-supervisory effect on the extension workers. This gives them a chance to think things over without having to worry about being embarrassed and also gives each and every participant a high level of satisfaction. By calling the monitoring of a group of farmers during a vegetation cycle a microproject instead of just a book-keeping entry at a large institution also appeals to their sense of personal responsibility and increases motivation.

There is also a learning effect present in the actual development of project that can be transposed to other projects being carried out by that extension worker.

4. The excitement of every-day work

Half of farmers use biological farming techniques

Up to 50% of the biologically farming families who sell their products under a familiar and officially accepted label like Max-Havelaar attend producer meetings organized by the CATIE-MIP project parallel to the extension worker training sessions. These families are organized into groups that follow a long list of rules and recommendations. To supplement this, in Zig-Zag these families learn something about the ecological balance in nature and become adept at

observing, recording data, analyzing and making decisions. Working together with families who use vastly different production methods often provokes intense discussions but, at the same time, also teaches them to respect and deal with people who think differently.

Further training is necessary to supplement basic training

The additional courses offered in integrated production supplement and enhance the insufficient training offered by universities. However, their inadequate infrastructure and unbroken philosophy of progress as well as the country's problematic political situation make collaboration difficult. In spite of that, a great deal of time and effort was spent to make an agreement with the Ministry of Agriculture to formalize this collaboration and firmly define its scope.

NGOs in Nicaragua with a high level of personal consistency

Extension workers from governmental institutions who are sent to these courses by their superiors are, in our experience not as consistent as NGO extension workers. They, on the other hand, are not just employees or bureaucrats, rather sometimes even members of the organization. They are interested in the work and want to learn more to get ahead. They often have a wide base of knowledge gained from professional experience and several training courses and are well integrated in their professional live. That quality is becoming more and more rare in Nicaragua, making it that much more valuable. They can sometimes help acquire projects using their newly learned project skills and their evaluation can result in a decision. Their work is taken seriously.

There are also motivated government officials, but they do not enjoy the same support. Mauricio Ponte, an extension worker at MARENA (Ministry for Agriculture and Environmental Protection) explained at a session that he is not allowed to use any working hours to meet with farming groups. So he does this on the weekend, even if he isn't paid for it.

Few drop out during training

The financial remuneration offered by the CATIE-MIP project only just barely covers expenses for food, transport and lodging. That way the project is not in danger of contributing to the self-preservation efforts of a non-productive NGO.

The decision-makers of organizations and institutions who send their extension workers to these training

⁵ Selected results of the study: Participación de las familias rurales en los procesos de capacitación y su impacto sobre conocimientos de plagas y plaguicidas de: Rugama, R.; Guharay, F. (1998), Proyecto CATIE/INTA (NORAD)

⁶ See note 5.

courses are included in the training system through their involvement in regional groups or special informational events. That gives the extension workers some support and a certain sense of assurance that they will be able to attend the courses during the whole cycle, even though their pending work still has priority.

5. Project acknowledgement

This kind of training course gives organizations the chance to be involved with groups of farming families throughout an extended process. That creates a certain continuity and has a lasting effect on the farmers. They don't work using fixed recipes - they use basic concepts. They learn how to understand, think through and observe ecological balances and make decisions based on this. This might be challenging for those involved, but it is more satisfying than simply following a memorized process step by step.

Field work requires self-initiative and gives participants an opportunity to have a say in how the project is structured. Another important aspect is that the project is nature-oriented. The physiological state of the plant, the stage of pest development as well as the requirements and needs of the participants provide the topics and set the date of the next course.

6. Challenges

Demand for this kind of training is rising

Last year, submissions of microprojects for further training in the CATIE-MIP project was far higher than its capacity. Many microprojects had to be turned down because of staff shortages and logistic limitations. Extension worker Otilio Muñoz from the NGO ODESSAR commented: "I've been here for 4 years already and sign up again every year. I think I still benefit from it because it is impossible to learn everything about the ecological balances and because new, current topics are always being integrated." In his NGO, he trains biologically-producing farmers and often has controversial ideas. But each time he takes his valuable time and comes for more training.

National staff will take charge of project

The project is set to be placed in national hands in 2003. The intention is to divide the functions of the CATIE-MIP project among different agencies. The "Congreso MIP", the integrated production congress, has been the highest committee of in which all universities, two ministries and similar programs have been

represented since 1998. It makes decisions on how to structure, staff and finance projects and is accountable to the projects' sponsors.

The existing regional groups along with professors from the universities and specialists from national, crop-specific groups will take care of logistics for and contents of the meetings.

The following issues must still be solved:

1. Outside financing will still be necessary.
2. The discontinuity in governmental institutions, both regarding staffing and structure, is great and negatively influences the project. The agricultural minister, for example, was replaced three times in 2000 as were portions of the staff.
3. The principle CATIE-MIP project must cut itself loose and place itself in other hands with the knowledge that there will be changes or that cuts will have to be made. That is a challenge facing the current crew of well-trained, proven scientists. Their work at this intersection between theory and practice has been excellent and they will play an important roll in the takeover.