

Appropriate Support for National Programs: Training, Research, Administration, and Funding

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ABSTRACT

The Biological Control Program (BCP) of the International Institute of Tropical Agriculture and national biological control programs, established specifically to control exotic cassava pests in Africa, are now evolving to address other pest problems. Formal training syllabuses are therefore to be broadened. Equally important is the need for the BCP and national researchers to collaborate to bring the value of biological control to the attention of decision makers. National programs currently need assistance in assessing the impact of the mealybug control campaign. In due course, they should be supported by the BCP in developing their own research programs aligned with national priorities. Within countries, a flexible administrative structure may be needed in which biological control activities are pursued within various institutions, rather than by a single formal program. Internationally, networks may be formed to tackle specific pest problems under the umbrella of a unifying biological control organization. Sustained funding of both national program development and basic research is now needed. National programs may need assistance in preparing projects for funding, but governments must take more responsibility for supporting programs or soliciting the interest of donors.

The Biological Control Program (BCP) of the International Institute of Tropical Agriculture (IITA) was launched in response to an international emergency—the appearances in Africa of cassava green mite and cassava mealybug and the threat to the basic food supplies of millions of people that these pests represented. From a technical point of view, the immediate objectives of the project were almost self-evident: it was necessary to identify effective control agents in the Neotropics, test them thoroughly, multiply them in the largest possible numbers, and then disperse them as widely as possible in the affected areas of Africa.

Given the size and nature of the problem, it was clear that the national authorities in affected countries would need a great deal of assistance to mount effective control campaigns. Large numbers of staff from national plant protec-

tion and agricultural research organizations would have to be trained to carry out the necessary surveys, releases, and follow-up work. Despite the success of a number of earlier biological control projects in Africa, classical biological control was widely regarded in 1980 as a novelty, and the techniques involved were not generally familiar to entomologists and agriculturalists in the continent. A massive investment in education and practical training was therefore needed, simply to ensure the success of the control campaign.

Fortunately perhaps, those involved in planning the training program were farsighted enough to take a longer-term view. It was not sufficient that national staff should be taught the practical techniques of biological control to enable them to implement the control campaign against the cassava mealybug. National scientists must have the opportunity of studying the fundamentals of the subject, through Master's and Doctoral degree programs, to enable them to participate fully in the research component of the program.

The success of *Epidinocarsis lopezi* (De Santis) in controlling the cassava mealybug has already alleviated the most pressing food supply problem in the earliest-affected parts of Africa and has at least brought within sight an end to the crisis elsewhere. This success has come faster than anyone could have dared to predict—and in many cases before national biological control programs were fully developed as effective, self-sustaining research organizations.

This has brought us, perhaps prematurely, to a point of decision, where it is necessary to try to assess the future roles of IITA and national programs and their relationships to one another. Until now, these roles have been fairly easily definable in terms of responses to the exigencies of the mealybug control campaign. Certainly the chronic problem of cassava green mite remains and will require a continued, and perhaps increased, commitment of research effort by all concerned. However, few national governments would see this problem alone as justifying, in competition with so many other pressing concerns, so large an investment of trained manpower and resources.

In this context, the objective of the present paper is to draw attention to some of the strengths and weaknesses in the effort so far to develop national programs and so to stimulate a discussion of the future needs of these programs.

TRAINING

Training at several different levels, formal and informal, theoretical and practical, has been a cornerstone of IITA's biological control program from its inception. From 1983/84, with the support of the Food and Agriculture Organization of the United Nations and the United Nations Development Programme (FAO/UNDP) some 30 trainees per year have each undergone a short, intensive

training course at IITA, lasting about 4 weeks, and covering practical biological control, concentrating on cassava pests. IITA's new Biological Control Program Center for Africa, in Benin, has better training facilities than those that have been available to the program in Ibadan, and consequently about 48 students per year will receive training from the beginning of 1989 onward, while the courses are being extended to 5 weeks. Some of the first trainees have now begun to return to IITA for "refresher" courses.

A somewhat smaller number of people have visited IITA for informal training or orientation, lasting from a few days to several weeks, and ranging from general briefings on the project for decision makers to intensive bench training or collaborative studies for researchers. Shorter, in-country seminars and training courses have been held in several countries, either to launch major national biological control campaigns or to raise awareness of biological control among non-specialist target groups, such as extension workers.

Finally, by 1992, over 50 national scientists will have received scholarships from the project to pursue post-graduate studies at the M.Sc., M.Phil., or Ph.D. level. This flexible program may involve research studies at IITA, the International Centre for Insect Physiology and Ecology (ICIPE), in the student's own country, and/or at universities with strong programs in biological control in Africa, Europe, or North America.

The departure of some of the most highly qualified national staff for long-term studies, at a time when control campaigns were getting under way in their own countries, has often involved some hard decisions. However, this investment is already beginning to pay off, as many of these researchers have now completed their studies and are returning to provide leadership and a strong research base for national programs. It should also be noted that some of these students, through their basic research, have made significant contributions to the scientific foundations of the overall project.

One problem encountered by the training program has been to ensure that returning trainees remain involved with their national biological control program and are not immediately transferred to other duties. While, in the long term, it may be desirable that persons with an awareness of biological control should be widely dispersed in research and plant protection organizations, and in decision-making positions elsewhere, in the short term these departures have sometimes seriously disrupted national program development.

This problem will be greatly alleviated as the BCP appoints regional coordinators who are able to work closely with national authorities in the selection of candidates and their subsequent deployment. However, as the threat of mealybug damage recedes, many countries will find it difficult to justify retaining some of

their best-trained entomologists in a formal program that is devoted largely or exclusively to biological control. IITA will need to develop a flexible approach if it is to remain in productive contact with its former "trainees" (in the broadest sense).

The continuation of biological control work, whether by a discrete national program or as an activity of individuals within various organizations, will depend on the value of this discipline being recognized by policy makers at all levels of government. Ultimately it will be the responsibility of national researchers to demonstrate to decision makers in their own country that biological control techniques can be widely and effectively used in plant protection.

However, a greater impact on policy may be achieved if the BCP can lend appropriate support to its collaborators in this special form of training. This support might include inviting carefully selected administrators to the BCP headquarters for orientation (as is done already, to some extent); films, posters, and other teaching materials could be supplied to national collaborators; senior members of the BCP staff could offer seminars or lectures of various kinds when visiting countries on technical support missions.

For the foreseeable future, there will be a continuing need for practical training in biological control techniques, both as natural wastage disperses those previously trained and as new pest problems are tackled. As regional and national structures are strengthened, it should be feasible to carry out more of this focused, target-oriented training within countries, allowing larger numbers to be trained for a given cost. However, there will still be a need to bring some trainees to the project headquarters, to enable them to become fully conversant, under ideal learning conditions, with the project's increasingly diverse activities.

In parallel, the scope of the training syllabus needs to be broadened, in order to increase awareness of possibilities such as the biological control of weeds and the role of biological control in integrated pest management. To achieve this diversification, it will be desirable, and indeed necessary, to bring in specialists from other organizations, who will at the same time reduce the already heavy teaching load on the BCP's core staff.

RESEARCH

It was an inevitable consequence of the situation in which the cassava mealybug control project was launched, that IITA undertook most of the necessary basic research, while national programs in Africa concentrated on local implementation and applied research directly associated with it. At the very least, this involved following the spread of mealybug, the spread of the parasite and its

introduction, and monitoring mealybug populations to detect the impact of biological control. It must be said that, in some places, even this basic objective has not been satisfactorily achieved.

Within the same framework we also need to understand better the relationship between the mealybug and its natural enemies in different ecologies. We often hear reports that biological control is "not working" in a particular place, but rarely are such comments backed by firm observational data, let alone interpretative studies to understand why it might be so. From a scientific point of view, it is actually very difficult to show whether a parasite is achieving control of a pest and, if so, how (see Neuenschwander and Gutierrez, these Proceedings). To resolve such questions will require very close collaboration between researchers from IITA, national programs, and other organizations.

A different facet of the research program is the need to document the impact of biological control in terms of reduced losses and economic benefits. Again there are technical problems, but these can and must be solved by interactions between researchers. Despite the 100-year history of classical biological control, there are very few studies that have adequately quantified its impact, costs, and benefits. Often this is a question of the long-term allocation of resources; funds are available for exploration and releases but once the control agent "appears to be working" (or not, as the case may be) sponsors are rarely prepared to continue support for adequate follow-up.

In the context of the present project, it is in the vital interest of all concerned to complete this follow-up phase. If the success of the cassava mealybug project is widely and properly documented, through collaboration between IITA and national researchers, this should help to ensure the continued flow of resources, which will be needed for sustainable national program development.

As the research capacity of national programs is strengthened by training and the development of facilities, a new relationship between IITA and its collaborators can and must evolve. National programs must begin to identify their own priorities and targets for biological control and carry out their own basic research to analyze pest situations. IITA should be ready to assist in both planning and implementation. Moreover, the BCP must be flexible and imaginative enough to provide this support, even when priorities selected by national programs do not coincide with its own. Where crops or pests targeted fall outside the mandate of IITA, other specialist organizations may be better placed than the BCP to provide support.

ADMINISTRATION

It is clear from the above that the immediate objective of the project should be to

establish a partnership between the BCP and national biological control programs, in order to tackle, firstly, pests of cassava and, subsequently, a range of other major pest problems. However, careful consideration needs to be given to the nature of this relationship and an appropriate administrative structure through which it might be achieved. At one extreme, it is possible to visualize a centralized structure in which IITA takes a clear leadership role. This would simplify research management and promote timely problem solving but might foster a counter-productive "us and them" attitude and hinder the development of self-sustaining national programs. At the other extreme, a loose association of national organizations, working independently or in informal collaboration, would entail a risk of wasteful duplication of effort and would be unlikely to be able to sustain a target-oriented, adequately funded research effort. Certainly, the present system of ad hoc, bilateral arrangements between IITA and individual governments and organizations leaves much to be desired.

One possible compromise is offered by a networking approach. Within a network, researchers from national and international participant organizations come together at intervals, on an equal basis, to identify priorities for research, to discuss methodologies, to allocate responsibilities and resources, and, finally, to share results. By dividing responsibilities, the best possible use is made of limited resources and, ideally, a productive spirit of scientific collaboration may be fostered.

However, for this approach to work effectively, the participants must recognize the importance of a unifying common purpose and be prepared to surrender some of their independence of action in order to achieve their shared objectives. Such common cause is easier to achieve if the network is not too large and its participants somewhat homogeneous. The scope and objectives of the network need to be carefully defined and its relationship to other groupings considered. Finally, a network may be most easily administered and funded if its composition corresponds to existing political or geographical groupings.

A network approach has been pursued by this project and its collaborators in eastern and southern Africa, initially as a medium for organizing cassava green mite research. The BCP is currently formalizing and reorganizing this approach with the planned establishment of regional associations for west, central, and eastern Africa and for the countries of the Southern African Development Coordination Conference (SADCC). Each region will have a coordinator, based on the spot, whose job it will be to foster links among participants. It is anticipated that these networks will extend their scope to select and tackle new target pest problems as these arise. Currently, plans for the SADCC regional network are the furthest advanced: a coordinator has been posted to Tanzania and major sources of funding to support network activities have been identified.

Regional meetings will in due course be organized and communication and information sharing will be promoted through the establishment of an electronic mail network.

The experience of this and other projects is that the networking model can be successful, but is not invariably so. Goodwill and common purpose are prerequisites. Considerable investments of manpower and material resources are needed if a network is to be truly productive. A two-tiered structure may be envisaged, in which small, specifically targeted networks are formed for a limited time period to tackle particular problems, while a permanent umbrella organization provides continuity and fosters contacts within the broad discipline of biological control. An Africa branch of the International Organization for Biological Control might appropriately fulfill this second role.

Equally important to the success of national biological control efforts will be the establishment of appropriate national institutions or the careful positioning of individual biological control practitioners within existing organizations. Biological control is a discipline in which research and implementation cannot be separated. Many countries are therefore unsure whether a national biological control unit should be established within a plant protection service or within an agricultural research organization. A university with an applied research program may also provide a suitable environment for biological control work. As the BCP begins to tackle a greater diversity of projects, involving different commodities and perhaps weeds as well as arthropod pests, its contacts with national institutions will become increasingly complex and diverse.

Certainly a single organizational model cannot be applied to all countries. However, the concept of a national biological control committee, involving representatives from a variety of interested organizations and taking responsibility for coordinating relevant work within the country, is one which could be more widely employed. Such committees have ostensibly been formed in some 14 countries collaborating with the BCP, though many apparently have not yet played an active or effective role.

FUNDING

In the final analysis, the future of this project and its various components depends on the ability of IITA and its national collaborators to obtain adequate and sustainable funding. IITA has so far been very successful in persuading international donors to support all aspects of the project, from basic research, through training, to implementation of biological control and national program development. Initially, the demonstrable seriousness of the mealybug and cassava green mite problems, the clear focus of the project and the definable, attainable nature

of its goals facilitated the effort to raise the necessary funds. The program is now, however, at a turning point, where vital technical and organizational decisions must be made.

The establishment of national biological control programs in most countries has depended on "initiation packages" provided by the BCP. The nature of the packages has necessarily varied greatly, depending on the needs and existing resources of recipient countries. Typically they have involved disbursement of grants of \$30,000-\$50,000 over a 2-year period to equip a basic field laboratory and provide a vehicle and sufficient travel costs to support an active field program. Some countries have received a second infusion of funds from the BCP to sustain this initial development phase. Funds for this purpose have mainly been contributed by donors directly to the IITA Biological Control Program for distribution to national collaborators.

The intention has always been that the initiation phase should be succeeded by a longer-term arrangement, which would guarantee and sustain national program development over at least a 5-year period. The hope was that multilateral and bilateral donors would be prepared to support country programs directly, on a country or regional basis, and, in parallel, fund the BCP's relevant research program and necessary technical support services. Longer-term support of this nature is vital to a discipline such as biological control, which requires sustained research and commitment of specialized, highly trained manpower.

In practice, it is now apparent that a large proportion of available donor funds are now disbursed through country or regional projects and that the donors' own rules usually preclude the transfer of such funds directly to an international organization such as IITA. In this situation, the BCP's supporting services (such as advisory visits, training, and the supply of natural enemies) can be funded by subventions from country programs, but only at the discretion of the country.

Serious obstacles have already been encountered with this system of financing. Perhaps most seriously, national accounting officers often perceive the charges made for the BCP's services as excessive when country programs are expected to bear the full economic cost of those services—some have even been known to refuse to authorize payments. If the BCP is to maintain or increase its capacity to provide appropriate support to national programs, donors will have to be ready at least to subsidize the cost of providing services by direct grants to the BCP.

A multilateral project currently being negotiated for the SADCC countries provides a model for the complementary funding of national program development and the BCP's supporting activities, though the 3-year duration currently foreseen is shorter than ideal. However, this project, as in the case of earlier initiation packages, has largely been arranged through the efforts of IITA to

solicit the interest of donors. It is very much to be hoped that national governments, recognizing the value of biological control, will be prepared to take over support for national programs, either from general aid budgets or from their own internally generated resources. Of course they will continue in any case to need foreign exchange to cover the cost of goods and services obtained from abroad and many will look to donors to provide this on a long-term basis.

The experience, around the world, of a number of commercial concerns and parastatals such as commodity boards, is that biological control can be cost-effective and represents an economically worthwhile investment. Moreover, at this stage international interest is sufficiently high to ensure that Third World countries that are able to demonstrate their need for biological control research and their capacity to carry it out should have little difficulty in obtaining sufficient funds. The BCP should be ready to assist national programs in selecting appropriate research targets and in preparing well-argued project proposals. However, the BCP should not be expected to generate projects and solicit funds indefinitely on behalf of national programs.

CONCLUSION

The achievements of the Biological Control Program of IITA and its national collaborators over recent years have been impressive by any standards. Not only has a devastating pest been rapidly and effectively brought under control; for the longer term, the foundations have also been laid throughout sub-Saharan Africa for the development of a discipline—biological control—which is potentially of even greater value. The program can no longer be regarded as a limited response to a particular emergency; rather, it must play a central role in demonstrating that biological control is a viable, permanent, and fundamental component of plant protection in an environmentally conscious world.

However, if the full potential of biological control is to be realized, the program must evolve scientifically, administratively, and financially. Just as national researchers must begin to take responsibility for their own research, they must also persuade their governments to take responsibility for ensuring that it is adequately funded. Research must be clearly targeted if it is to be successful, and the necessary follow-up carried out to demonstrate that it has been so. Research objectives will be more easily achieved through close collaboration and the free exchange of information between collaborators.

For the moment at least, donors should be prepared to continue their support and, most importantly, pledge their support over a longer time scale. It would be naive to propose that IITA should immediately abdicate its leadership role or that biological control in Africa is ready to be self-sustaining without outside support.

However, appropriate support for national program development at this stage can help to increase the self-reliance of these programs and provide an atmosphere for productive and sustainable collaboration.

WORKSHOP DISCUSSION

With reference to support for training, the workshop endorsed the idea that the scope of both the BCP syllabus and the selection process could be widened, to include new pest problems as they arise and to include government officials and policy makers in specialized sessions designed to inform them and help them understand the importance of the science involved in biological control. The allocation of responsibility for applied and basic research, and the necessary support that each would entail, was discussed by the participants. It was agreed that both components were equally valuable in biological control research and that it was vital that the highest scientific standards should be maintained by national programs and international collaborators alike. Notwithstanding the general scarcity of funding, it was noted that there is support available for well-argued proposals by countries who demonstrate the ability to carry them out, and that the BCP should continue to assist national programs in securing this funding wherever possible.