
GUEST EDITORIAL

'Farmer First' for establishing IPM

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Thanks to inertia from thirty years' official sanction and sustained by continuing commercial advertisement, pesticide dependency persists almost everywhere in the developing world. Integrated pest management (IPM) programmes seek to minimize the role of synthetic pesticides in pest control systems, emphasising outbreak prevention in combination with a safer, economical and ecologically sound array of alternative pest control measures. As yet, however, few IPM programmes have made a lasting impact on farmer knowledge, attitudes or practice.

I think a major part of the problem is deficient evaluation and adaptation of alternative pest control practices and inadequate teaching of IPM. Those tasks are partly or wholly the responsibility of agricultural extension. In particular, IPM requires different and/or higher-quality training for both extension officers and farmers than most existing extension systems are presently designed or equipped for.

In this editorial I want to explain that view and to draw attention to an innovation that could help break the impasse, a 'Farmer First' extension training approach now being fielded by Indonesia's National IPM Training and Development Programme with technical support from the United Nations Food and Agriculture Organization. This approach has been discussed in education and agricultural development publications and was previously acted upon mainly by small-scale, grassroots organizations. Because such training could contribute to the establishment of village-level IPM and may presage a sea change in extension institutions, a wider audience of field entomologists should be aware of it.

Falling short with the status quo

As described by Kenmore *et al.* (1987), the basic ingredients of IPM for irrigated rice have existed in Asia for some time. The need is exceptionally clear. Most farmers apply insecticide several times a season even though there is usually no economic benefit to be gained, insecticide misuse is implicated in the rise of the current key insect pest, the brown planthopper (*Nilaparvata lugens* (Stål)) (Homoptera: Delphacidae). The International Rice Research Institute and national research programmes produced a range of alternative pest control methods and found out more than a decade ago what it takes to train small-scale farmers in IPM. Yet IPM extension is only now starting to have a significant impact on Asia's vast rice farming population. The crux of the problem has been quality versus scale.

Since it is relatively complex, location-specific and management-intensive, IPM is an educational challenge. The farmer must learn the principles and acquire the knowledge and skills necessary to make autonomous decisions based on specific farm conditions. Adequate rice IPM training using conventional teaching methods requires about 40 hours of good-quality instruction in the paddy. Intensive hands-on practice is necessary each week over an entire growing season, with follow-up for one or two seasons while farmers gain confidence as independent practitioners.

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In order for IPM to gain official support and reach large numbers of farmers, responsibility for its extension must be given at least in part to national agricultural extension institutions. However, after 1984 when the baton was passed from the well-trained, enthusiastic staff of closely supervised rice IPM pilot programmes to the large-scale government extension systems in the Philippines, Indonesia and Sri Lanka, the quality and intensity of training dropped too far to change farmers' pesticide use as much as had been hoped.

National agricultural extension systems in those countries fit a general developing-country pattern. They are large, multipurpose hierarchies used to operating in the 'transfer of technology' mode: instructional messages about technical packages developed by researchers are passed by field agents to farmers. This is a top-down approach with 'experts' in charge and, in practice, little feedback from below.

Accordingly, conventional extension training assumes the traditional teacher-student relationship wherein the trainer dominates and the trainee is expected to be interested, deferential and unquestioning. The priorities of rank and Science overshadow real-life needs. The lower their rank (the closer to the farmer), the less training and rewards extension officers receive. Field extension agents are normally trained between cropping seasons, chiefly with theoretical classroom lectures in technical subjects. There is little opportunity for field practice, and teaching skills are largely ignored, so trainees are not fully prepared for their job of working for farmers. The supervision, quality and extent of training, and the motivation of all concerned tend to deteriorate at every step between a headquarters 'train-the-trainers' course for senior officers and the average field agent's performance.

Rice IPM extension in Sri Lanka benefitted from excellent support by the Department of Agriculture, highly able and motivated senior staff, extra field training for all ranks of officers, and special teaching materials. Nevertheless, working within the system I saw farmer and extension officer motivation evaporate as training imposed from above trickled down the institutional pyramid. In general, at the field level inertia, indifference and many conflicting responsibilities resulted in too few IPM class meetings and low farmer attendance. Classes were often held in temples or extension centres instead of in the rice paddy, and extension agents fell back on the familiar lecture approach. Follow-up was nonexistent.

Given that government extension organizations operating under tight budgets and with civil service limitations face certain intractable problems — that technical, educational, administrative, supervisory and evaluation skills will always leave something to be desired, and that there will never be enough incentives and rewards for good work by village-level extension agents — is there some means to boost their effectiveness? The response of rice IPM trainers in Indonesia has been to turn from the conventional top-down training approach to a more powerful training process that centers on farmer participation.

Radical ideas about farmer participation

'Radical' refers to a call for fundamental change. In this case, change is being demanded in the assumptions and patterns according to which agricultural development institutions and their staff currently function.

Paulo Freire, a Brazilian educator who honed his views about nonformal education in literacy campaigns, pointed out that adults are most motivated to learn things that relate directly to their life experience. Interest and exhilaration in learning is connected with understanding why things happen as they do and the presentation of knowledge as a tool for action, so that people can change their lives for the better. Learning should be dynamic and liberating, spurring people who were passive to become searchers and innovators.

In Freire's essay *Extension or Communication* (Freire, 1981), top-down extension is decried as perpetuating an ideology of elitism, paternalism/passivity, and social control. Instead, Freire stresses the need for a relationship of equality and dialogue between extension agent and farmer such that the partial knowledge of each is combined to solve problems and bring about positive change most effectively.

Field scientists comprising what is sometimes called the Farmer First school of agricultural development (Chambers *et al.*, 1989) echo Freire's views. They reject conventional top-down agricultural research and development as unproductive of truly appropriate innovations. Stress is laid on the need for farmer participation at every step of the R & D process in order to draw on farmers' intimate understanding of local conditions and constraints, their innovativeness, and their skill at making the best possible living using limited resources.

As in Freire's educational sphere, roles change. Agricultural specialists should not dominate but instead should act as consultants, facilitators and collaborators, stimulating and empowering farmers to analyse their own situation, to experiment and to make constructive choices. Extension agents should teach that analysis and decision making process. One method of field management training emphasises the ecological concepts is 'agroecosystem analysis', wherein simple descriptive diagrams prepared in the field from farmers' information and direct observation are used to order information and generate working hypotheses.

Placing the farmer at the centre of the technology development process is wholly consistent with the IPM goal of making the farmer a confident manager and decision maker, free from dependence on a constant stream of pest control instructions from outside. In that spirit Asian IPM trainers contributed to the new paradigm and have recently woven elements described above into Indonesian rice IPM training. Pimbert (1991) discusses the relevance of Farmer First to IPM and gives a general description of the corresponding educational process, which serves the needs of sustainable agriculture as a whole.

Indonesia's 'Farmer First' approach to IPM training

In Indonesia, the basic rice IPM training framework of long standing is retained but now farmers are the main actors in the teaching process, termed "*Apa ini?*", literally "what is this?" Trainers avoid an authoritarian role by answering each question with another question that will help trainees think for themselves. Thus farmers make their own discoveries and draw their own conclusions.

Apa ini? and agroecosystem analysis are used for weekly class decision making about pest control. Farmers are divided into small groups to monitor the crop and then each group analyses the field situation by making a diagram of the rice ecosystem. The rice plant is at the centre of the drawing, with tiller number, diseased leaves, water level, rat damage and weed density indicated. Natural enemies observed are drawn to the left of the plant and pest insects to the right, both with their numbers noted. With their drawing as the focus of discussion, group members respond to a series of diagnostic questions in order to decide whether any pest control action is necessary. Then each group presents and defends its summary to the other trainees. The trainer facilitates by asking leading questions or adding technical information if necessary. This process allows farmers to integrate and practice their skills and knowledge and gives trainers an opportunity to evaluate the trainees' ability.

Experimentation by farmer trainees supports this active learning. A part of each training class is set aside for activities that demonstrate key aspects of IPM. For example, farmers discover insect life cycles and predation by rearing insects.

Farmer-to farmer extension is encouraged. Graduating farmer trainees are awarded certificates authorizing them to train other farmers with technical backup from extension field staff.

Farmers have accepted these methods warmly. Hands-on exploration in their own paddys is a welcome replacement for the boring lecture mode of most extension training. Both farmers and their trainers are motivated by the excitement of new discoveries and the reinforcement of sharing them publicly with others.

Indonesian farmers' changed practices appear to approach the potential of IPM more closely than the impact achieved by any other rice IPM extension programme. A follow-up study of the 50,000 farmers trained in the programme's first year found that although rice yields did not change, insecticide use fell from an average of 2.8 sprays per farmer to less than one per season, with the majority of farmers not using insecticide at all.

This innovative training has been carried out so far on a medium scale (by Asian standards) and chiefly by Pest Observers of the Indonesian Crop Protection Directorate, with assistance from Extension field agents. Therefore the long-term impact of the new methodology as implemented on a national scale by a regular extension service has yet to be tested. The questions are how well the nonformal education process can be implemented by existing large-scale extension systems and how much it will increase the effectiveness of the IPM training that they deliver.

A glimpse of the future?

Röling and van de Fliert (1991) speculate that because IPM typifies the integrated crop management that is now required to increase agricultural productivity, innovations such as those described above, prefigure a general trend. At the same time these authors underline the fact that change brings conflict.

Daunting institutional questions are raised by large-scale extension training under the Farmer First paradigm. Existing government organizations function with opposing incentives and ideology. In participatory education, people skills — communication, teaching methodologies and group dynamics, for instance — are as important as the technical side and must be combined constructively with it. This multidisciplinary orientation is educationally and attitudinally demanding of agricultural workers who are accustomed to learning, thinking, teaching and operating along narrow scientific lines. Moreover, such extensive training, although extremely cost-effective in Indonesia, requires a large investment of time and money which governments may be reluctant to commit and sustain. Since it is foreign to mainstream agricultural institutions, has political ramifications, and is the newest fashion in agricultural development, Farmer First has inspired controversy and is met with distrust by old hands who have seen a succession of 'quick fixes' come and go.

Yet some innovations survive fashion. IPM, after all, is one. Because the human dynamics and robustness of Indonesian IPM extension methodology respond to key problems of motivation and training quality, I believe the principles it embodies represent another such advance. I think this model will be adapted for improving IPM training in many contexts.

Increased understanding of the crop ecosystem and the investigation and self-reliance encouraged by training should strengthen several other important aspects of the IPM development and extension process. Farmers will be better able to generate new ideas and evaluate and adapt pest control practices in relation to their needs. Moreover, they are likely to keep asking for more learning and for answers to new questions. Demand from below should motivate researchers and extension officers to keep IPM dynamic and focused on farmers' needs.

For IPM too, it makes sense to put the farmer first.

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