

Case study on disease management action research in Vietnam

- Presented by Janny GM Vos (CABI Bioscience) during the Regional Trainers' Workshop on Vegetable IPM Curriculum Development in Chiangmai, Thailand (18-24 February 2001)

Introduction

Since 1996, Farmer Field Schools for vegetable IPM have been organised in Vietnam. Farmer trainers have emerged from these Field Schools and have trained other farmers in formally organised Farmer-to-Farmer Field Schools. By early 1999, some 14,500 farmers had attended vegetable Field Schools and had become IPM Expert Farmers. The Expert Farmers proved to be keen to continue the learning process, either through individual or group field studies or through linking up in IPM Clubs, which meet regularly to discuss agriculture and other related issues. Field Schools and follow-up activities have shown that pesticide use (as well as costs) in vegetable production can be reduced through a better understanding of the agro-ecosystem.

Farmer Participatory Research

Farmer participatory approaches aim to empower farmers with knowledge on field ecology and confidence to make informed decisions. Farmer participatory training (FPT) is practised in Farmer Field Schools. Field School curricula are based on the concept of discovery-based learning and aim at enabling farmers to become active learners and independent decision makers. In Field Schools, field studies are conducted to compare conventional practices, as applied in the control plot, with an IPM plot, which farmers manage based on regular observations and in which they apply interventions that they learn to understand and analyse. Alongside field studies there are participatory exercises, interactive discussions and group dynamics which all contribute to them learning together how to become more environmentally friendly and more profitable farmers. The actors in farmer participatory training are typically the farmers, who are facilitated to learn by trainers / facilitators (either extension or NGO field staff, and/or Expert Farmers), who in turn make use of a curriculum for which the resource material is brought together by resource persons (any knowledgeable person, often researchers, field staff and/or Expert Farmers).

The concept of farmer participatory research (FPR) can be interpreted in many different ways. In fact, the term currently causes great confusion best summarised by the question: "Who participates in whose research?". One interpretation is that farmer participatory research is to fill knowledge gaps using a "hands-off" approach for independent experimentation by farmers, while applying research skills using a "hands-on" approach to joint problem-solving. Depending on the objectives, different levels of farmers' involvement occur in problem defining and designing, testing, monitoring and evaluating IPM options. As much as possible, farmers set the research agenda, do the implementation of the field studies including observation and evaluation, while the trainers / facilitators and the resource persons assist in the design of the studies and the choice of methods of observation and evaluation.

It is clear that the participatory element in the described approaches involves integration of the roles of farming, extension and research, which is a dramatic change from the conventional top-down system of delivery of information from research to extension to farmers (Figure 1).

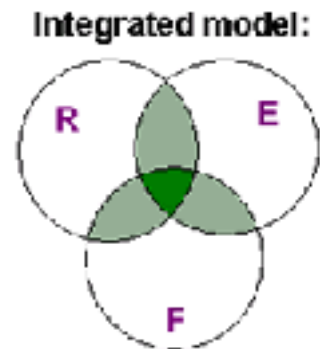


Figure 1: Top-down delivery of information to solve farmers' problems compared with integrated generation of solutions to farmers' problems (R = research community; E = extension community; F = farming community)

Disease Management Action Research - Vietnam Showcase

Expert Farmers conveyed a need for more knowledge on vegetable disease management to the national IPM programme, which in 1999 initiated a pilot activity called Participatory Action Research (PAR) for vegetable disease management with support from the FAO Asia regional vegetable IPM project. CABI Bioscience was requested to provide the technical backstopping through a series of missions and supply of information.

The pilot began in January 1999 with a planning workshop that brought together trainers/facilitators from three provinces (Hai Phong, Ha Tay and Lam Dong), and resource staff from the Plant Protection Department, Regional Plant Protection Centre and National Institute of Plant Protection (NIPP). The workshop aimed at identifying a rough plan-of-action for the trainers to facilitate farmer participatory research on disease management in the respective provinces. During the planning workshop, the following activities were developed (five steps):

1. Prioritisation of diseases and crops

Trainers from each province prioritised the crops for study, and an agreement was reached to focus on soil-related diseases: bacterial wilt in tomato, root rot (fungal disease) in bean, bottom rot (fungal disease) in cabbage and bacterial wilt in cucumber. However, as it became clear that not all diseases had been properly identified, the urgent need for their identity to be clarified was agreed.



2. Refresher of appropriate vegetable disease exercises

During the workshop, practical disease exercises were undertaken as refreshers for the trainers, such as characterisation of disease, disease 'zoos' / infection studies, and preparation of disease triangles. During a session on composting and the use of compost it became clear that the term 'compost' created confusion. In Vietnam, a mixture of manure and crop residues is

called compost even before it is fully composted. Immature compost can still contain spores of disease, while in mature compost those spores have been killed during the composting process.

3. Preparation of disease triangles

Information on disease and crop management was compiled in group discussions as well as during workshop field visits and discussions with local farmers. 'Disease triangles' were prepared that led to potential management options that could be applicable in the various provinces.



Disease triangle with corners 'host', 'pathogen' and 'environment' and potential disease management options that focus on inactivating specific corners of the triangle to prevent disease development

4. Prioritisation of disease management options

After completing the disease triangle, group discussions were held to identify which management options were applicable in Vietnam, which ones were already being practised by farmers, and which ones were not being applied or were being applied incorrectly. E.g. applying compost to manage tomato bacterial wilt was applicable in Vietnam but was not yet being done properly by farmers (the composting process was not complete before farmers applied the compost to the field).

5. Preparation of plan-of-action

Much attention was given to the design of PAR and observation and evaluation methods, and drawing up action plans for each province. For the purpose of the workshop, which was basically to practise what trainers would be doing with farmers in their respective provinces, each workshop group focused on one topic and designed a study. All groups came up with field studies, but during the discussions attention was requested for small pot studies to complement the field studies. Next, participants designed observation parameters and evaluation methods for the field studies they had designed. The use of simplified statistics, a

method developed in Indonesia, was promoted to assist careful interpretation of the results of field studies.

After the planning workshop, the provincial trainers, now the facilitators of the PAR, returned to their respective provinces and organised farmer workshops to go through the five steps described above. During these farmer workshops, the details of the PAR were finalised, with farmers choosing specific diseases to be studied, and farmers deciding on the various treatments as well as the design of the study.



Farmers' pot experiments in Ha Tay (top picture) and Lam Dong (right picture) investigating disease ecology on cabbage

In March 1999, a backstopping visit showed that despite the very short time-frame available for preparations, farmers were well underway with their PAR studies in the North (Hai Phong and Ha Tay Provinces) while the season hadn't begun in the South (Lam Dong Province). In Ha Tay, field studies had been delayed, causing problems with crop establishment, while excellent pot experiments were established.



Hai Phong farmer showing tomato seedlings raised in banana leaf pots filled with soil from a pond mixed with compost. According to the farmer this method yielded more and healthier seedlings than the conventional method of raising seedlings in flat beds in the field

In Hai Phong, nursery experiments were already yielding results and field studies were being established without major problems. Exchange visits were subsequently organised to achieve cross-pollination of ideas between the Northern provinces.

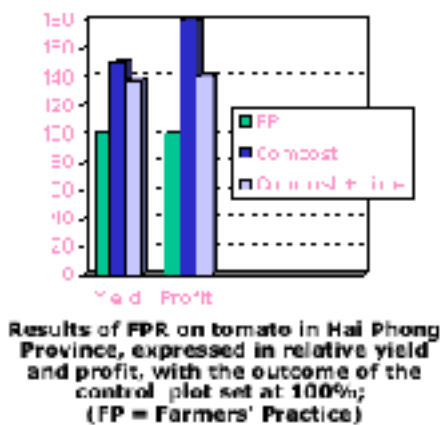
Following the first season of PARs in the North, an evaluation workshop was held in September 1999 as an evaluation and planning forum for IPM trainers and farmers from each of the three provinces and resource personnel from the National Institute of Plant Protection, FAO and CABI. Although the weather during this first season of the project was largely unfavourable for the diseases chosen for study, and some mistakes were made in some experimental designs, farmers and trainers were enthusiastic about the results and what they had learned, and were determined to continue.

For example, the participating farmers in Hai Phong Province focused on compost - how to make it and its impact on cucumber wilt (identification still not clear) and bacterial wilt in tomato (*Ralstonia solanacearum*). They also evaluated the effects of using pesticides only after weekly agro-ecosystem analysis (AESA) judged them to be necessary, rather than following local pesticide practice. In both crops, the incidence of the disease under study was too low to reach any conclusions in this first season, but farmers were encouraged by what they experienced, and in particular at how IPM practices could make their crops more profitable. In cucumbers, it was found that adding manure to the planting hole at about 19 t/ha led to better cucumber plant growth and yield, and lower disease ('blight') incidence. The yield was 80% higher than for the farmers' practice treatment and this, together with a reduction of pesticide

applications from nine to five per season, led to an almost astronomical increase in profits, from VND 14,000/sao in the farmers' practice treatment to VND 255,000 in the IPM treatment. [1 sao » 360 m²; US\$ 1 » VND 13,500]

In the tomato trial, seedlings for the IPM treatments were raised in banana leaf pots filled with clean soil and compost, whereas farmers traditionally raise them in flat field beds. At transplanting, the IPM treatments added manure to the planting hole at about 15 t/ha ± crushed lime. Farmers found that there was less damping off in seedlings, and less seed was needed, when plants were raised in clean conditions in pots rather than in traditional seed beds. Results indicated that pest and blossom end rot incidence were similar in all treatments, but AESA led to pesticide applications being reduced from 11 in farmers' practice plots to seven in the two IPM treatments. Yields were also higher by 37% and 50% for treatments with and without lime, respectively. Profits increased from VND 558,000 in the farmers' practice treatment to VND 787,000 in the plus-lime IPM treatment, and VND 1,007,000 in the no-lime IPM treatment. The farmers also conducted pot experiments to study the effect of clean soil and/or irrigation water on disease spread and infection. They concluded that disease can be harboured in crop residues, soil or water, and that a combined approach to disease management has to be taken, including field sanitation, crop rotation (rice-rice-cucumber), and roguing of diseased plants and using them for composting.

The enthusiasm of the farmers at the evaluation workshop was striking. It was clear that the lead was now coming from the farmers and trainers, who had already made plans for the next season and were inviting resource persons to come back and help.



Follow-up

The Hai Phong farmers continued to conduct another round of field studies over the 1999 - 2000 winter season during which the PAR farmers further decreased pesticide use to two applications in comparison with ten spray events by non-IPM farmers. This led to profit increases of about 20% compared with non-IPM farmers. The PAR farmers have now developed an integrated approach for more effective management of bacterial wilt and other diseases of tomato:

1. Minimise disease source in the field through field sanitation, timely removal of diseased crop residues and rotating tomato with rice.
2. Properly prepare and apply compost in the field.

3. Minimise mechanical injury of stems and roots by raising seedlings in banana leaf pots.

As a result, in early 2000 the Provincial Government of Hai Phong sought the assistance of the Plant Protection Sub Department (PPSD) in the design of field activities to improve tomato cultivation in the province. The PPSD subsequently received funds from the Local Government to support farmers in carrying out similar PAR field studies on larger areas in preparation for the opening of an Italian tomato processing plant in the province. The Hai Phong PPSD, IPM trainers and PAR farmers joined forces to train other farmers to reduce pesticide use in tomato through a better understanding of biological control, crop compensation and improved cultural practices.

Conclusion

In 1999, the pilot initiative on participatory research truly grew into a 'Vietnam showcase'. It demonstrated the positive impact of participatory research on Expert Farmers' further understanding of ecological principles and through this their management practices and incomes. The outcome in Hai Phong Province shows that the described pilot led to farmers' leading follow-up research. The fact that the PAR farmers paved the way towards larger scale training activities of the community shows that participatory research can be a very successful tool in an integrated programme of farmer participatory training and research.

Further Information

Vietnam national IPM programme, contact Mr Dung
FAO IPM project office Hanoi, contact Dr Pat Matteson
CABI Bioscience consultant, contact Dr Janny Vos (j.vos@cabi.org)
The 'Vietnam showcase' has also featured in Biocontrol News and Information 21(1) (March 2000), 10N-11N.
Weblink: <http://pest.cabweb.org/Journals/BNI/BNI21-1/TRAIN.HTM>