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Science and Farmers: IPM by Farmers

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Introduction

Integrated Pest Management (IPM) has evolved in the last fifty years from a technical mix of various components (Stern et al., 1959; Smith and Reynolds, 1966; Bottrell, 1979; Kenmore, 1987) to a farmer led programme (Dilts and Pontius, 1998). The evolution of IPM to its present day necessitated intense debates by a wide cross section of people in the world, which has led Kogan (1998) to conclude that the concept has become a household word. Along the way, IPM took different values but successful IPM has always followed an ecological approach (Kogan, 1998). The FAO Programme in rice in Asia offers an opportunity to reflect a rather myopic view suggested by Morse and Buhler (1997) that IPM is too idealistic for resource poor farmers such as in Asia. It also brings into focus the perennial question, IPM for farmers or IPM by farmers? Or simply put, do we solve problems for farmers or do we help farmers solve their own problems?

Like many IPM programmes, the FAO Inter-Country Programme for development and implementation of Integrated Pest Control in South and Southeast Asia, initially focused on an integration of various components. Farmers were passive recipients of technology developed by researchers. While farmers have locality specific problems, IPM technologies prescribed general recommendations in the form of economic thresholds or other forms of rules to follow. Farmers often didn’t have a clue about how economic thresholds were formulated and very much less about the interactions between populations of herbivores and their natural enemies. This led to suggestions that IPM is too complex for resource poor farmers (Goodell et al., 1981). Efforts were made to simplify the technology given to farmers, such as providing answers to problems specified by farmers (Adhikarya, 1994). Farmers continued to be passive recipients of technology provided by researchers. While some farmers adopted some of the technology, they were often unable to innovate. This was due to the farmers’ lack of understanding of the agroecosystem. It was common that farmers would shuttle from one problem to another without realising the causes of the problems. Working on the basis that ecology is fundamental to successful implementation of IPM (Kogan, 1998), it follows that for resource poor farmers to successfully implement IPM, they have to understand how the agroecosystem functions. This paper describes the process of educating rice farmers to understand ecological science so that they can develop IPM by themselves.

An introduction to ecology: What is this?

In the history of Asian rice cultivation, the most shocking event is probably the widespread outbreaks of the brown planthopper (BPH) in the 1970s and to some extent the 1980s. At least three international conferences were organised to discuss this pest. Most papers were focused on trying to solve the outbreaks and few really examined the causes. Kenmore et al. (1984) and Ooi (1986) first pointed out the link of insecticides to BPH outbreaks. Insecticides killed off effective predators and other natural enemies, which kept rice pests in the tropics in check. Often, farmers did not know about biological control and some rice farmers sprayed their fields when they see spiders and other natural enemies (Winarto, 1995). This lack of understanding of ecology meant that many rice farmers did not know that their rice fields were protected by the action of natural enemies.

To address this issue, the FAO Inter-country Programme (ICP) adopted a farmer education approach. The IPM Farmer Field School (FFS) represents a learning approach based on a season long learning experience. In the FFS, farmers learn about ecology and agroecosystem management. A rice field is used as a field laboratory (Russ and Dilts, 1998). Learning ecology involves getting farmers to discover what is going on in the rice field. Field walks invariably leads to a common question, What is this? This encourages farmers to be curious and look for answers. Often, farmers using simple experiments could discover the answers. For example, to determine if an arthropod is a herbivore or otherwise, the farmer would carefully collect the organism, place it into a cup and would then place parts of rice plants inside. Regular observations will confirm the role of the arthropod in the agroecosystem. Such a study is popularly known as 'insect zoo'. To determine if an arthropod is a predator, a known herbivore is introduced into the insect zoo (Ooi et al., 1991).

<u>Understanding ecological concepts: ecosystem analysis</u>

Weekly FFSs provide an opportunity for farmers to study the population trends of arthropods. Results from insect zoos help farmers to sort out the herbivores and natural enemies (or defenders). Farmers are encouraged to make drawings of rice plants to reflect the growth stage in the field. They will draw the arthropods observed in the field and accord them the position where they were found. Usually, the herbivores would be placed on one side while the natural enemies will be placed on the other side of the plant. Farmers will make presentations to their fellow FFS participants about the condition in the field. The ecosystem analysis also takes into consideration preliminary results from experiments, which help farmers understand plant compensation.

The analytical processes employed in the FFS enhance farmers' capabilities to examine the conditions, in which they live and work.

<u>Generating knowledge: experimentation</u>

After farmers have graduated from FFSs, learning continues. Farmers are encouraged to continue to carry out studies to increase their knowledge. Hence, when agricultural authorities in Indramayu decided on a prophylactic approach towards ‘preventing pest outbreaks’ in late 1998, the farmer group, Bumitani, decided to evaluate the insecticide component of the package recommended. Farmers planned an experiment where five fields owned by their group would not use the insecticides recommended (namely carbofuran granules and fipronil sprays). They found five other farmers who would adopt the package and sought their support to monitor arthropod populations in the fields. All ten fields were planted with the same variety (IR 64) and were planted about the same time. Field practices were similar with the exception of insecticide applications. The farmer group would collect weekly data; record costs and eventually analyses the data. Results would be shared with all participating farmers as well as other interested farmers in the village and those outside.

Farmers who wanted to know more are duplicating this approach in many villages. In addition to receiving information, they wanted to generate information to improve their production. Often, they come out with ideas that revolutionised the way rice is grown.

Farmers as scientists: farmer empowerment

Farmers who carry out experimentation tend to be more confident. They tend to be critical of suggestions made by outsiders and would insist on proofs. A story was related by a field trainer of how a group of farmers in Java reacted to a group of salespersons who wanted to promote a new insecticide. The group of salespersons touted the product as a breakthrough by a developed country to produce an insecticide ‘compatible with IPM’. In marketing language, it was a safe compound. At this suggestion, a farmer asked if he could taste the insecticide since it was safe. To this, the salespersons replied that it was not safe for human consumption but was safe to the environment. Another farmer then got up and informed the group that he would collect some spiders and predatory insects to see if they would survive the insecticide. The salespersons suggested that this was not necessary as the insecticide had already been tested in sophisticated laboratories. However, farmers in the group insisted that they should test the insecticide to evaluate the claims that it is safe. They asked for samples to test in ‘insect zoos’ and in the field and invited the salespersons to return in the next few days to discuss the results. Strangely, they didn’t return to the village!

A vital aspect of scientific studies is that it can be repeated. Hence, scientific papers emphasised as much on the methodology as the results. The ability of farmers to question research results and insisting on repeating experiments to confirm them shows that they are scientists. They are curious and they want to know more. In the process, they become better farmers. Such farmers tend to face challenges with confidence. The FAO’s Programme for Community IPM in Asia encourages this education approach and farmers have become good IPM trainers as well as organisers of IPM activities that strengthen the community’s food production.

Acknowledgement

This paper is dedicated to the thousands of farmers who are confident in developing IPM as a means to secure food production.

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