Farmers implementing IPM in Ghana

To meet Ghana's future demand for rice, its policy makers encourage the expansion of rice area and the use of intensification packages to raise yield per hectare.

A tendency to increase the use of pesticides indiscriminately in lowland irrigated rice in Ghana poses a high risk of new pest problems. Ghana is among the major importers of pesticides in West Africa.

To counter this risk Ghana's bold policy makers recently took decisive steps:

- IPM was declared a national policy for crop protection;
- blanket pesticide subsidies have been abolished;

legislation has been developed to strengthen the environmental protection control over pesticide importation and use.

The Government of Ghana, with assistance of FAO, the Philippines national IPM programme, and WARDA established a project with the overall objective to increase national capacity to implement IPM. The project focuses on intensified rice schemes where there is a risk of excessive pesticide use. In 1995, a 122-day IPM Training of Trainers course for 28 extension officers selected from all regions of the country was conducted at Dawhenya Irrigation Project, which was recently rehabilitated by an EC project.

The keystone activity of this course was three seasons-long Farmers' Field Schools with a total of 75 farmers, of whom 15 were women. Every week during this season the participating extension workers (trainers) in their study fields, and then farmers in their Farmers' field Schools, made field observations on plant growth and condition, soil and water condition, weeds, insect pests and their natural enemies, and diseases.

Each group processed and analyzed their observations in order to make a consensus decision regarding the proper management of the field to be evaluated in turn during the next week's re-entry into the field. These Agroecosystem Analyses formed the core of the weekly training curriculum to which were added activities on special topics that that trainers and farmers carried out in their fields.

These topics included comparisons of cultural and chemical weeding practices that showed a combination of hand weeding and water management to be more economical than regular herbicide use as in the conventional package.

Both trainers' and farmers' Agroecosystem Analyses compared crops grown under the conventional inputs package with IPM crops. The conventional inputs package included two applications of carbofuran intended for stemborer and defoliator control in the vegetative stage. In the IPM fields farmers made decisions based on the weekly Agroecosystem Analysis. As a result of these decisions no insecticides were used in the IPM fields and hand weeding replaced herbicides.

For Farmers' field Schools, net return was 32% higher in IPM; yields in the two crops compared were 4.03 tons per hectare, and a more than US$100/hectare savings. For the Training of Trainers' fields, IPM net returns were 77% higher due to 3.74 tons yield compared with 3.65 and accompanying savings in inputs.

Farmers and extension participants also carried out Participatory Action Research to develop their skills for investigating cause and effect relationships in local farming problems and stimulating farmers' design of local research. The experiments included cage studies on natural enemy behavior and biology and open field studies of crop compensation after simulated insect damage.

Trainers and farmers discovered that levels of damage well above the 20% dead hearts observed in the rice fields had no significant effect on yield, because the rice crops more than recovered from damage. This helped farmers make decisions not to apply insecticides unnecessarily.

One experimental plot in the Farmers' field School showed symptoms of soils alkalinity. The ability of the rice crop to produce tillers was greatly reduced. The crop looked weak. When farmers entered the field during the weekly agroecosystem analysis plants would bend down in the mud as roots were poorly developed.

While discussing this problem in the Farmers' field School, farmers related that when similar problems occurred in their fields they would apply chicken manure with good results. Even though the crops were nearing the panicle initiation stage, the farmers suggested applying chicken manure to the plot.

The Farmers' Field School facilitators initially reacted reluctantly, saying it would no longer help;

anyway they had already applied nitrogen fertilizer. The fact that farmers brought up an interesting idea for doing a field experiment surprised most extension workers. After a long discussion everybody agreed to take a few square meters of rice in the plot to apply chicken manure and see what would happen.

The pH of alkaline soil drops when chicken manure is applied. As formerly fixed soil nutrients become more readily available in the soil, plant growth and development were enhanced, and the farmers' previous observations were confirmed.

Neither farmers nor extension workers knew the particular scientific concepts under their empirical knowledge. The farmers' successful experiment allows new useful concepts to be introduced.

No formal lectures were delivered during this training. The whole curriculum was experiential and discovery-based. Instead, training activities were designed to have participants learn by doing. About 50% of training time was spent in the field.

Exchanges of information and generation of knowledge was facilitated through sharing observations (both from group fields and prior experience), brainstorming, and long spirited discussions.

The IPM experts implementing the course were primarily facilitators of learning and only added new information to farmers' or participants' discussions when it was felt necessary and appropriate. Farmers participated, debated, and experimented enthusiastically.

Experience with the training method in Asia helped make the curriculum effective, responding to the motivated extensions staff and especially the tremendous skills and drive of farmers.

The Government of Ghana, through its Ministry of Agriculture has started a full second season on Farmers' Field Schools in five locations around the country with considerable investment of staff, facilities, and fund.