STATUS OF RICE PEST MANAGEMENT IN SRI LANKA

Nallini de Alwis

Rice production in Sri Lanka has intensified over the past decade. The success achieved in tailoring varieties for high yield, extension of good cultural practices, stress on balanced fertilizer use and pest control are the technological factors that have contributed to progress towards self-sufficiency in rice.

The extent to which the rice crop is damaged by insect and other pests vary greatly in time and place. It is therefore difficult to assess the overall losses due to their ravages. However, based on field plots, where the crop has received pesticidal protection throughout its growth, yield increases ranging from 17–61 percent have been recorded (Wickremasinghe, 1979). Reduction of this loss by developing less costly, effective control measures is the challenge facing us. But a program of pest control relying on routine schedules of chemical application for sustaining rice yields, is not the answer for the following reasons:

i. Economics of chemical control
ii. Changing status of rice pests.
iii. Potential for resistance to pesticides.
iv. Resurgence of primary and secondary insect pests.
v. Bio-type selection against resistant cultivators.
vi. Adverse environmental effects on humans, livestock and fish.

Rice is a low value crop and under rainfed conditions prone to high risks. The need for implementing effective pest control measures to enable the small time rice farmer to reduce ravages caused by insects, diseases and weeds have been receiving the attention of rice scientists. As a result new varieties which have resistant genes to blast, gall midge, brown and white backed planthoppers and thrips have been or are being developed. However, a fully integrated pest management system cannot be immediately realised in practice as a high level of expertize is essential for the execution of such a programme (FAO, 1966). The technique to be used must meet the needs of the farmer and their adoption will be conditioned by the climate, the existing cropping system, the local insects and pathogens, weed flora, the efficiency of water management and socio-economic factors. This will take many years.

The accumulation of research information and the development of feed back organization from the field requires trained and permanent personnel at all levels of crop protection-research, surveillance, extension and administration. The lack of these is a major constraint in adopting a comprehensive programme of pest control. Further, to be effectively implemented the system must accommodate itself to the social framework in the area as a change in technology may have political and social implications.

In the field of insect control the change over from routine spray schedules or timed treatments was made in the mid-sixties. This approach could be considered as a first step towards integration of pest control measures. The next major step was taken when the search for genes resistant to pests of major importance was initiated. As a consequence new varieties possessing resistant genes to the gall midge and the brown planthopper have been developed by our scientists. Detailed information on the ecology of the key pests is by no means complete but data on the impact of agronomic practices, natural enemies and the growth stage or duration of the host plant on the population dynamics of certain pests has been accumulating. These findings have enabled entomologists to modify their recommendations so as to avoid some of the adverse effects of pesticides.

The current recommendations for the control of pests of rice advocate scheduled treatments only in very few instances. There are:

(1) The recommendation of a preventive treatment for the nursery, based on the fact that seedlings are likely to become loci or reservoirs for pests that have migrated from rice stubble, ratoons or weeds in adjacent fields. The area so treated is small in relation to the area covered by seedlings at transplanting.

(2) The gall midge, O oryzae infests all stages of the crop when environmental conditions are conducive to its propagation. Generally, the build-up of this pest tapers off after maximum tillering as parasite activity reaches a peak. Based on the necessity to protect the productive tillers and the delay of three weeks before the appearance of damage symptoms, scheduled treatments are recommended for susceptible varieties grown in gall midge endemic areas.

(3) In the wet zone the paddy bug L. varicornis is a recurrent pest. A routine control measure is the application of two insecticidal treatments 7–10 days apart after the crop flowers.

For all other rice pests, insecticides are recommended on a need basis. However, the lack of man-power to advise these innumerable small farmers on the improvement of crop management as an initial crop protection measure has stalemated the need-based pesticide policy of the Agricultural Department.

Many of the chemicals recommended for the control of rice insects have a broad spectrum of activity; however, compared to Endrin and Parathion, the currently recommended chemicals are inherently less toxic compounds., Further some of these broad spectrum insecticides like BHC, Diazinon and Carbofuran, are recommended for use in an ecologically selective manner so that their greatest effect or impact is on the target species e.g.:

(1) Using granular formulations for the control of the rice stem borer, the gall midge and the brown and white backed planthoppers.

(2) Timing the application of the pesticide so that it coincides with the most critical stage of the pest. Insecticidal spray applications for the rice stem borer based on the light trap data are so timed as to control the first instar larvae. In the case of the paddy field mole rat, the timing of control measures is to reduce the rat population before the peak in reproductive activity.

(3) Timing the application of insecticides to coincide with the most susceptible stage of the host plant. The application of insecticide granules for the control of the gall midge is timed to protect the productive tillers of the rice plant. In the case of the paddy bug treatments give coverage during the milky stage of the crop.

(4) The use of pesticides only in restricted areas to reduce environmental pollution e.g. baits for crabs, mole rats and birds and the protective insecticidal coverage given to rice nurseries.

Thus, based on the available knowledge and in the absence of an effective system of that surveillance or forecasting to guide pest control, the following practices have been recommended for the control of pests in rice cultivation:

(1) The use of resistant or short aged varieties in areas endemic to the gall midge and BPH respectively.

(2) Staggered planting to be avoided.

(3) The balanced use of fertilizer, sound agronomic practices like spacing and weeding with the use of high yielding short aged varieties.

(4) Cultural practices that minimize pest problems — the manipulation of the water level, slashing of weeds on the bunds and clean weeding — to be encouraged.

(5) Nurseries to be raised (where feasible) and chemically protected to obtain pest-free seedlings.

(6) Use of insecticides only on a need basis and where possible in a selective manner for the control of the brown plant hopper and stem borer.

(7) BPH and stem borer to be monitored (by insect counts, light traps or egg mass counts) for the timing of insecticide application.

REFERENCES

FAO/1966. Proc. FAO Symposium on Integrated Pest Control 1965 — Volumes 1–3 Rome, Italy

Wickremasinghe, N., 1979 Paddy Pest Control — The Review of Research on Rice Pests in Sri Lanka. Proc. 34th Annual Session, SLAAS, 1979, Pages 23–50.

Wickremasinghe, N., 1978, An Approach to Integrated Pest Control of Rice..Trop. Agric. 84, 1–7.