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EARWIGS: INSECT ALLIES OF PHILIPPINES' FARMERS

by JEAN-MARC FLEURY

A tiny insect that has a pair of hard, pointed pincers at the end of its body and is known to attack European fruit trees is an indispensable ally of small farmers in the province of Batangas, Philippines.

It was once believed that the insect crept into the human ear, whence its common name of "earwig". But while the European species sever the petals and stamens of orange and peach flowers, the Philippines' earwigs vigorously attack the insects that gnaw at the centres of corn stalks. They tackle the largest larvae, resolutely pursuing them into their galleries and dismembering them with their hind pincers.

Without the help of earwigs small farmers who plant corn after their main rice harvest would experience catastrophic losses because insecticides are of little use against burrowing insects that hide in the stalks and appear only when the plants are almost mature. Thanks to earwigs, corn-fields in Batangas province are now yielding well without the use of insecticides. Pleasantly surprised, scientists who have studied the cropping methods used by farmers in this region, located south of Manila, have had to admit that the corn growers of Batangas were absolutely right in taking no action against the insects.

It must be recognized that the small farmer, with limited resources and a great deal of work to do, cannot wage a large-scale battle against the tiny, destructive pests. Often his only alternative is to trust to luck.... and earwigs. Even when effective chemical insecticides are available, their use would require too much of his time and resources. Agricultural researchers intend to take these constraints into account and are planning an insect control strategy that will enable small farmers to increase their yields without overtaxing their resources.

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The reason researchers do not plan to ask farmers to put more energy into the struggle against insects is simply that they are saving them for other tasks. They intend to ask farmers to increase their annual yield of cereals and vegetables.

At the International Rice Research Institute (IRRI) in Los Banos, researchers are mainly concerned with the world's most important food grain. Since the early 1970s, however, a team, supported in part by funds from the International Development Research Centre of Canada and directed by a Canadian, Dr. Hubert Zandstra, has expanded the research activities of the Institute on new multiple cropping systems. The team is investigating how to improve traditional methods of intercropping rice with corn, sorghum, beans and melons. All aspects of agricultural production are being studied, including insect and disease control.

Entomologists participating in the program under the direction of Dr. James Litsinger began by seeking to better understand the farmers' methods in order to improve them gradually, rather than propose major changes -- often more impressive in theory than in fact. They found, for example, that in the case of the mung beans, planted throughout the Philippines after the rice harvest because of their high resistance to drought, most farmers merely sowed the seeds and reaped the crops. Losses are considerable and yields reach only 200 kilograms per hectare, whereas, with the use of insecticides, yields of 1,500 kilograms would be possible. The small farmer prefers not to spend much time and energy on this crop, and researchers admit that given the farmers' limited inputs the yield is good.

But closer study has revealed that several traditional agricultural practices contribute to reducing insect damage. Although the mung grower does not always realize it, a number of his methods reduce insect populations. For example, he uses three times more seeds than required, thus compensating for the great number of seeds destroyed by plant lice. Instead of ploughing the soil, he plants mung seeds directly in the rice stubble-field and thereby wards off fly infestations. He also knows that he must plant at about the same time as his neighbours, or before them, because if he delays, harmful insects will reach maturity in neighbouring fields and quickly invade his. Finally, he prevents diseases and parasites transmitted through the soil by rotating crops and flooding his rice fields.

In fact, entomologists have realized that most anti-bugs techniques used by the small farmers -- crop rotation, date of planting and crop combinations -- are methods of cultural control. For example, the infestation of corn by burrowing insects can be considerably reduced by alternating rows of corn and peanuts.

It has become evident to the researchers, however, that many farmers do not plant disease and insect-resistant strains, that they do not use insecticides or use them badly, and that they know little about biological control -- three major ways of fighting insects. And so, they remove most visible insects by hand, unaware that a single ladybug, for example, can destroy thousands of plant lice larvae.

The scientists involved in the cropping systems program hope to promote "good" insects and all other means that can be utilized by small farmers without draining their resources. Since seeds must be planted in any case, why not plant insect and disease-resistant varieties? Rice varieties that have natural defences against various diseases and insects are already available. Rapid progress should be possible with the mung bean, the most popular varieties of which are easy prey to 26 insects and six diseases!

Crop yields could also be rapidly increased by using the available insecticides more effectively. Many farmers do spray their fields, but often at the wrong time and in insufficient quantities, thereby doing their crops more harm than good, says James Litsinger. In fact, the insects that prey upon pests are generally more mobile than those that devote their energies to eating a leaf or a piece of stalk. "Useful insects thus absorb more insecticide and are destroyed in greater numbers than pests," explains the entomologist. At least, by using adequate doses of pesticides, it is not only the good insects that are eliminated. According to Dr. Litsinger, the use of insecticides by farmers is a striking example of a poor application of a modern technique. Fortunately, a technological solution to this problem has just been found: a new insecticide sprayer invented in Great Britain automatically applies the right quantities.

Nevertheless, pesticides will remain outside the means of many peasants. Unquestionably, their mung bean harvests would increase fivefold if they adopted effective methods of spraying insecticides, but scientists admit that this would require a corresponding increase in the time and money invested.

Taking a realistic approach, scientists propose that insecticides be used only as a palliative until cultural controls, biocontrols, and resistant varieties are developed. They do not claim that they will be able to eliminate the laborious task of insecticide spraying completely, but they plan, in the long run, to considerably reduce its role in pest control. In the case of mung beans, they feel that the use of multi-pest resistant varieties, biocontrol and cultural control methods should account for 80 percent of the yield improvement due to insect and disease control, while the use of insecticides would account for the rest.

And so, piece after piece, researchers assemble the puzzle of improving cropping sequences. Not only do they have to choose the best suited crops, but they also need to protect them against insect cohorts which are already sufficiently populous.

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