

Natural enemies called up for fight against flies

FARMERS ARE BEING ENCOURAGED TO USE LOCAL BIODIVERSITY, NOT PESTICIDES, REPORTS REBECCA THYER

The accidental introduction of the potato leafmining fly *Liriomyza huidobrensis* (LMF), an insect from South America, is causing major downturns in production for Indonesian farmers.

The notorious pest has attacked all types of vegetable crops, but has caused catastrophic damage to potato crops since it found its way into the country in the mid-1990s. And it threatens Australia.

Unlike other pest problems, pesticides are of limited use in controlling LMF and their indiscriminate use only serves to aggravate the problem.

A recently completed ACIAR project, led by Dr Peter Ridland from the Victorian Department of Primary Industries, found that attempts by Indonesian farmers to control the pest with chemicals were not only ineffective but also costly, and could lead to the development of resistance.

“Spraying two to three times a week for the 10-week season has still led to yield losses of up to 80 per cent in potato,” he says. “Instead, improving impact of biological control is going to be very important.”

Through surveys of infested vegetable crops, the ACIAR team has revealed a rich complement of natural LMF enemies, including 19 species of parasitoid wasps and one predatory fly. Their discovery has opened up exciting new options for

research and extension, Dr Ridland says.

The team has focused on conserving and exploiting local biodiversity and now aims to pass this knowledge on to farmers.

“Farmers will be able to solve a difficult problem by using information, not technology,” he says. “By conserving and exploiting their local biodiversity, farmers could reduce their dependency on chemical pesticides. This should result in substantial economic, social and environmental benefits.”

Dr Ridland says the challenge is using this information to provide farmers with practical solutions. “One of the key messages is that widespread use of broad-spectrum insecticides is not helpful. So, we have to come up with a system that gives farmers confidence in actively promoting biological control.

“We are still working out ways to get this knowledge to farmers; we need to develop practical protocols for farmers

to manage their resident natural enemies effectively that we are all happy with.”

The project has also helped Australia develop strong contingency plans in the event that LMF enters Australia.



Leafminer flies cause significant damage to plants and reduce production.

Controlling measures boost crop production

RESEARCHERS ARE USING LESSONS LEARNED IN VIETNAM TO HELP INDONESIAN FARMERS, REPORTS REBECCA THYER

Using brewery waste as bait has helped Vietnamese farmers reduce the incidence of fruit-fly infestation, leading to a fourfold increase in fruit and vegetable production. Now researchers behind this successful ACIAR-sponsored Vietnamese project – Professor Dick Drew and Dr S. Vijayasegaran from Brisbane’s Griffith University – are hoping for the same results in Indonesia through one of two new ACIAR projects. Both projects aim to increase fruit and vegetable production through better pest and disease control measures.

Project leader Professor Drew says infestation can cause crop losses of between 40 and 100 per cent. However, using an attractant protein bait system, made from brewery waste, loss rates can be greatly reduced.

The project involves identifying pest species to meet World Trade Organization health standards for international trade, introducing the attractant protein bait system, and building a protein production plant in a brewery to provide low-cost protein. In southern Vietnam the team built a protein plant that uses Foster’s brewery waste.

The protein spray is applied as a tiny spot to each tree in the orchard, attracting and subsequently killing flies. As it is applied discriminately, levels of spray needed are lowered, producing environmental and economic benefits.

Professor Drew says the Vietnamese project was so successful that the Vietnamese Prime Minister Phan Van Khai visited the team to thank them. A similar outcome in Indonesia is hoped for and would create immediate production gains.

“It will upgrade villagers’ intake of fruit and vegetables, providing major nutritional benefits,” he says. “In the longer term, export opportunities will increase, leading to more money for the country.”

A lack of satisfactory disease-control measures is also devastating Indonesia’s banana crops. In recent years the problem has worsened with fungal and bacterial wilt diseases caused by *Fusarium oxysporum* and blood disease bacteria wiping out major production areas.

Dr Peter Taylor, who is leading the ACIAR research project to diagnose and manage banana wilt diseases, says that despite research, disease-monitoring programs and testing of potential bio-

control agents, losses continue.

“Bananas have been dying for the past 10 years and at the moment there is no effective control method for these diseases,” he says. “We need to find out more about the pathogens and how they interact with their host plants.”

When the diseases strike, the impacts are devastating. “The plant’s defence mechanisms – which produce a gum – respond too slowly, eventually causing it to choke, wilt and die.”

The team will undertake field and laboratory work to understand more about the diseases, and develop systems to control them.

Disease management systems will be extended to commercial smallholders, mixed-system farmers and backyard growers, at an early stage.

“We will look at ways to enhance the plant’s own defence system and establish clean, disease-free plant stock,” Dr Taylor says.

He says it is important to control disease outbreaks to ensure that bananas remain a viable crop, to improve farmer’s livelihoods. “The impact of disease on farmers income is great. Some farm just half a hectare, so if a disease wipes out their crop, they have little to fall back on.”