

ASSESSMENT OF AN INTEGRATED CASHEW IMPROVEMENT (ICI) PROGRAM, USING WEAVER ANTS AS A MAJOR COMPONENT, IN CASHEW PRODUCTION IN VIETNAM

Cashew (*Anacardium occidentale* L. [Sapindales: Anacardiaceae]) is an important industrial crop in Vietnam, and it contributes to more than 200,000 farmers' households incomes in rural areas. Pest damage is one of the constraints reducing farmers' income, and overuse of insecticides has caused environmental and health problems. The integrated cashew improvement program using weaver ant¹ (*Oecophylla smaragdina* (Fabricius) [Hymenoptera: Formicidae]) as a key element developed for Vietnamese cashew farmers has been fully assessed. Weaver ants effectively controlled the main insect pests on cashew, including the tea mosquito bug, the brown shoot borer, leaf rollers and the leafminer. Weaver ants reduced the pest damage to an acceptable level compared to the insecticide treatment, or to levels under the control threshold. At the same time as weaver ants reduced the damage caused by the major pests, there was no change in the damage caused by sternorrhynchan pests. However, damage caused by sternorrhynchan pests was either negligible or well below the control thresholds. This

is because the ICI program enhanced the population of natural enemies which, in turn, suppressed sternorrhynchan pests.

The implementation of the ICI program enhanced arthropod diversity and natural enemy populations in comparison to the farmers' conventional farming method (FCF), which used insecticides heavily.

Compared to the farmers' conventional farming methods, the ICI program generally produced similar nut yield, but with a reduction of expenses by 10.3% and an increase of net profits by 13.3%. In addition, the ICI program also produced higher quality nuts than the FCF.

The competition between weaver ants and other ant species was identified as an important factor in implementation of the ICI program. To resolve this, orchard understorey and boundary tree management, focussing on improving the availability of other food sources, was proposed. Large scale continuation of the implementation of the ICI program is highly recommended for the Vietnam cashew industry.

¹ Weaver ant, golden weaver ant, yellow tree ant, green tree ant, red tree ant, Asian weaver ant, orange **gaster** **ect**; and kiến vàng (Vietnamese).



Photo 1. Weaver ants catching a tea mosquito nymph



Photo 2. Weaver ants catching a leaf roller