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Duck-rice-fish system without insecticides: An useful organic agricultural value chain in rural north Vietnam

THI MINH NGUYEN¹, VIET LY LE², MARGARET GILL³

¹*Animal Husbandry Association of Vietnam (AHAV) (retired), Vietnam*

²*National Institute of Animal Science (NIAS) (retired), Vietnam*

³*The Macaulay Institute, United Kingdom*

Abstract

There is an urgent problem of contaminated feedstuff for human or animal by excessive use of insecticides for producing agricultural products, which can be a dangerous impact on health by immediate or hidden toxification. This serious problem is not only in Vietnam, but also in tropical developing countries.

This study therefore aimed at evaluating how to prevent or avoid the use of insecticides by keeping local ducks, fish and rice symbiotically. These systems could guarantee for safety agricultural products and environmental protection without insecticides, also help poverty alleviation for poor farmers.

Experiments were conducted with Co ducks in the symbiotic systems of duck-rice (DR); grower duck-fish-rice (DFR); layer duck-fish-rice (LDFR); fish-rice (FR); and compared to a control using insecticides for growing rice (R).

First, a technical test was done and results showed that rice production in R and DR systems were not different: 4053 and 4036 kg ha⁻¹ resp.; minimum residue limit of insecticides (MRL) was 3.9 and zero g kg⁻¹ of dry paddy resp.

Then the systems of R; FR; DR; DFR and LDFR with different number of ducks/hectare were compared. Results showed that rice yields were similar (4125; 4195; 4115; 4479 and 4743 kg ha⁻¹) between R; FR; DR; DFR and LDFR systems resp. MRL were 4.2 g kg⁻¹ of dry paddy; 0.05 g L⁻¹ of water in R system and zero in others. Net benefits were +1.94; +8.54; +9.91; +44.22 and +55.64 million VND ha⁻¹ in R; FR; DR; DFR and LDFR systems resp. at the exp. time.

The above systems proved useful and many poor farmers have been designing the none-insecticides systems for their cultivation for many years and expand up to now. Furthermore, many poor women became stakeholders in alleviation of poverty.

Keywords: Alleviation of poverty, Co duck, duck-fish-rice systems, experiments, insecticides