Agroecology Impact Evaluation of Pest Management with an Environmental Impact Quotient (EIQ) Model in Northeastern China

Qiao Zhong (China), 2008

Intensive pesticide application has been a concern for the general public because of the serious problems it has raised. Requirements for reducing pesticide application potential impact have been increasing. As a result, pesticide risk indicators have been developed as a quantitative method for assessing pesticide potential impact to meet the requirements. The Environmental Impact Quotient (EIQ) model, developed as a user-friendly pesticide risk indicator, was applied as a potential impact assessment tool to evaluate the agroecological impact of pesticide application in two villages, Taojia Tun and Gaojia Cun, in northeast China. Assessment scores were categorized into Field Total EI, Farmer EI, Consumer EI and Ecology EI for evaluating pesticide potential impact at the field level of each household. Field Total EI, the average of Farmer EI, Consumer EI and Ecology EI, which provided the total environmental load of pesticide application, yielded higher scores in Gaojia Cun than in Taojia Tun. Overall in the two survey areas, the EIQ model calculation indicated that pesticides had a high potential impact on the ecological component resulting in the high scores obtained from the Ecology EI, but there was less impact on the human perspective based on the relatively low scores of Farmer EI and Consumer EI. However, the actual situation of farmers' behavior and pesticide practices suggested much higher chances of exposure to pesticides than that indicated by the EIQ model. Also, how farmers applied pesticides had a higher potential to increase the amount of pesticide residue on vegetable products for consumers. These findings implied limitations to the EIQ implementation despite its easy-to-use features; thus, the real situation of pesticide application should be taken into account for pesticide potential risk assessment. The results also indicated that a participatory approach involving farmers is required for sustainable pest management in facilitating the EIQ model.