Chapter 6
Implementing Integrated Pest Management in Developing and Developed Countries


Abstract Integrated Pest Management (IPM) systems in developed countries are largely based on substantial bodies of available information from a number of sources, including published material, extension agents, contract crop consultants and, more recently, the internet. Delivery systems for this information have traditionally been through extension agents in the USA but the internet is playing a larger role. IPM in developing countries, such as those in Southeast Asia, has been addressed most effectively through massive training of farmers through farmer field schools and farmer participatory research in the region. S.E. Asia is characterized by large numbers of farmers cultivating small plots. Production systems involve substantial amounts of labor inputs, which often put farm laborers at risk from exposure to harmful chemicals. Mechanical devices that replace labor in developed countries are not common in the S.E. Asia region. Technological advances have made an impact mainly through improved plant varieties and cultural practices to enhance yields. IPM training has taken hold throughout the region as a means to establish the farmer as the primary decision-maker and to equip him or her with an understanding of the critical relationship between agricultural output and field ecology. Training programs in all S.E. Asian countries are aggressively spreading the message to “grow a healthy crop” as the first step in establishing sound IPM programs. Results from some IPM programs are presented and discussed but the list is not all inclusive and is always evolving and changing with the farmers’ crop mix and increased knowledge of the agricultural ecosystem.

Keywords Integrated Pest Management · IPM · developing countries · developed countries · farmer field schools · farmer participatory research · IPM tactics
6.1 Introduction

Much has been written on the subject of integrated pest management (IPM) over the past 40 years. As one might expect, most of the published literature is focused on IPM in developed countries (Dent 1991, Kogan 1998, Metcalf and Luckman 2004, Pedigo 1989, Pimentel 1991, Olsen et al. 2003, Smith and Reynolds 1966, CAST 2003, and others). More recent publications deal with “globalizing” IPM (Norton et al. 2005, Maredia et al. 2003) with examples from several parts of the developing world. This chapter will draw heavily on the authors’ experiences in S.E. Asia and the USA for the comparisons between implementing IPM in developing and developed countries. Examples presented, however, are not all inclusive and methods and techniques are evolving and changing as IPM systems, worldwide, are refined.

6.2 Implementing IPM in Developed Countries

The impetus for developing IPM programs in the USA came from problems and concerns from overuse of chemical pesticides which was highlighted in Rachel Carson’s book Silent Spring (Carson 1962). As early as 1959, Stern et al. emphasized the need for integrating various control tactics in a classic publication entitled “The Integrated Control Concept”. As Olsen et al. (2003) pointed out, IPM has over a 40 year history in the USA that combines biological, cultural and chemical techniques into an ecologically sustainable system. This chapter barely touches upon development of IPM in the USA because this is so well documented elsewhere. Instead we will emphasize development and implementation of IPM in developing countries, with major emphasis on Indonesia.

Implementation of IPM in developed and developing countries requires completely different approaches. Many mistakes have been made using developed country models that simply do not work in a developing country context. First, the infrastructure, extension, information and delivery systems are usually not available in developing countries. Developed countries have highly sophisticated extension and information systems readily available to farmers. Also, even if developing countries have extension agents or other agricultural agents, they are limited in number, superficially trained, and often provide only token services to large coverage areas. Also, developed countries have access to information via various published media, agricultural extension agents and the internet. In contrast, many rural agricultural villages in S.E. Asia have only recently gotten electricity. Developed country IPM programs are built on years of research information. This information is generated by US Land Grant Universities, the US Department of Agriculture, private industry and other national and international research institutions. Various tactics include the use of high-yielding varieties with resistances against various diseases and insect pests, field monitoring to determine action or economic thresholds, and highly regulated pesticide testing, sales, and disposal systems. Some crop production industries have their own crop protection specialists that conduct research on various commodities.