

Herbicide Resistance and Sustaining Food Security in South Asian Rice Culture – A Case Study

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Introduction

Weeds cause significant reductions in crop yields of all tropical crops. In rice, the staple food crop of all Asia, weeds could reduce approximately 60 – 70% of potential yields (Florez et al, 1999). Hence judicious weed management, especially in staple food crops is a critical factor for securing and sustaining food security in the developing countries of Asia (Timsina and Conner, 2001).

The advent of herbicide technology and its use has resulted in most farmers resorting to these practices for weed control, especially in rice culture of the tropics. However, over the recent past, farmers, especially the smallholder subsistence farmers, have found it difficult to obtain required quantities of herbicides, due to increasing prices caused by externalities and removal of subsidies. Hence, most smallholder farmers, who have problems of weeds, have begun using suboptimal rates of herbicides for weed management. The more affluent farmers however, use excessive quantities due to the greater prevalence weeds due to poor management.

The continued use of herbicides, while bringing in some degree of success has also caused problems. The evolution of herbicide resistance in weeds, especially with the use of suboptimal rates has caused some degree of concern in the developed countries for over 30 years (Beckie et al, 2000). More recently, the evidence of herbicide resistance has been identified in some selected locations in the developing regions. However, studies on the incidence of herbicide resistance have been carried out principally in the industrialized countries. Hence, a project was carried out to determine the possible incidence of herbicide resistance in rice fields of Sri Lanka, as a case study for the region, as this is an important and relevant field of research in weeds (Hall et al, 2000).

Objectives

The objective of this project was to determine weed populations in rice fields of farmers who use different rates of herbicides for weed control, to identify changes and continued presence of weed species and populations and observe possible resistant species. This would provide an insight into possible measures to develop weed control strategies for increasing yields, thereby sustaining food security of farmer families and also using optimal rates of herbicides for conserving the natural resources, which are degraded by frequent and excessive use of pesticides.