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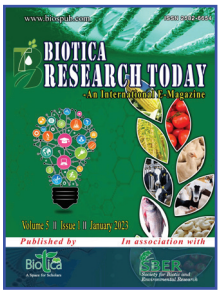

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Challenges of IPM Adoption in India

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Abstract

It is increasingly understood that rising agricultural pesticide use has negative effects on both human and environmental health. A substitute for the traditional pest management method is Integrated Pest Management (IPM). IPM can increase agricultural profitability by lowering the cost of pest control, and it also ensures fair, secure, sufficient, and consistent flows of both food and ecosystem services. In India, IPM has mostly remained an intellectual activity and hasn't had much of an impact on the farming community in terms of application or adoption. Lack of knowledge among farmers is a major concern as it contributes to their reluctance to employ IPM technology. The worldwide accepted strategy for pest management is Integrated Pest Management (IPM). Actually, it's often referred to as "integrated pesticide management." Here, we highlighted about the difficulties in true advancement and interpretation of the IPM method to achieve during its deployment and expansion.

Introduction

One of the challenges to enhancing food yield globally is the presence of insect pests. The global losses brought on by different insect pests vary with the crop, the region, and available pest control methods. Pests have undergone considerable changes as a result of new crops, cropping techniques, pests, and crop intensification. During the green revolution, high yielding agro-cultivars emerged that improved the availability of food grains through the use of high yielding varieties and energy inputs like pesticides, fertilizers, and irrigation. In the previous decades, food production has increased faster than population growth owing to the adoption of better technologies. In addition to raising production, new technologies have led to a rise in the usage of synthetic pesticides and fertilizers. Over-reliance of pesticides has led to food poisoning, ground water contamination, environmental pollution, pesticides residues, and pest resurgence. The misusage of insecticides and the management issue that causes the consequence are generally regarded as the origins of Integrated Pest Management (IPM); nonetheless, the paradigm has broadened to include two opposing schools of thought throughout the time. The first promotes the judicious use of pesticides and has been referred to as "pesticide management" (Brunner, 1994), "tactical IPM" (Barfield and Swisher, 1994) and "the ecologist armed with chemicals" (Perkins, 1982). Regardless of the school of thought to which one belongs, the strategy was created for sustainable agriculture with the intention of ensuring fair, secure, sufficient, and steady flows of both food and ecosystem services. One of the main tenets of IPM is the rationalization of pesticide use.

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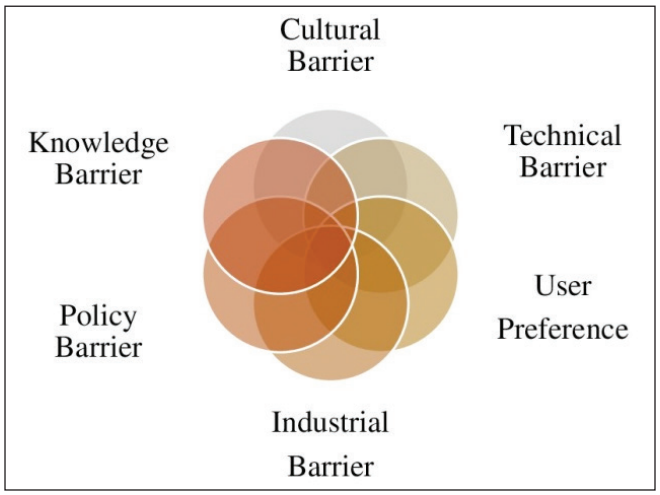

Figure 1: Barriers in IPM adoption

Challenges in Adoption of IPM

1. Lack of Information and Proper Technical/ Research Support

Small-scale urban farmers who belong to non-farming backgrounds are most frequently reported to lack basic agricultural and horticultural skills. These growers frequently receive basic agricultural training from non-profit groups, sometimes in collaboration with local government or other service providers (such as agricultural extension services). However, such training typically only covers the most fundamental information on pest and weed management. In order for advising information to be effective, it must be both approachable and relevant to the intended audience. Various strategies may be required to make advisory content available to the target audience if there are considerable barriers such as linguistic, work-related, or culturally unique learning styles.

2. Lack of Accessibility to Information

Lack of knowledge about or inability to access online information sources can be a barrier, particularly in rural areas where internet connectivity may not be available or may be prohibitively expensive. Likewise, some small-scale farmer communities may find it culturally undesirable to receive information via phone or computer. However, even in locations with easy access to the internet, it can still take growers some time to gather, assess, and validate the data required to address a new issue. In terms of pest and disease management, where prompt responses are frequently required, this can be a considerable downside.

3. Availability of Appropriate Pest Management Inputs

Small-scale farmers may not be able to use some pest management strategies due to cost alone, but also because certain inputs may not be available in pack quantities that are acceptable for their scale. For example, some insecticides permitted for organic production require pH buffering for usage in alkaline water, but in some nations, organically-approved buffering chemicals are only available in very large containers, with restricted availability and extremely expensive shipping costs (again, holding far more than would be needed by a small-scale farmer).

4. Lack of Political Voice and Visibility

Both of the aforementioned issues share a common root cause, which is that small-scale farmers, particularly in developed nations, do not have the same level of political power or exposure as their more established counterparts. While urban agriculture and the growth of organic produce have in some ways helped to restore this equilibrium, the underlying issue persists. As previously mentioned, the creation of grower associations or co-operatives by groups of small-scale producers may improve their capacity to more effectively represent their needs to governmental bodies as well as to research and educational institutions, with regard to agricultural policies and the prioritization of IPM.

5. Difficulty in Reaching to the Substantial Percentage of Resource-Constrained Farmers

The majority of farms in low and lower-middle income nations are smaller than 2 ha, occupy between 30 and 40% of the total area of cultivated land, and have shrunk in size between 1960 and 2000. Farmer field schools, media campaigns, and other training and outreach initiatives have been successful in introducing IPM to farmers with limited resources and encouraging them to utilize it. However, such initiatives are costly and are only likely to benefit a hundreds of millions of farmers who are resource-constrained. Limited percentages of IPM-trained farmers in dispersed communities are not enough to influence other farmers. A critical mass of knowledgeable farmers scattered throughout nearby areas is required before information can be effectively communicated and adopted by non-participating farmers.

6. Inadequate Management Decisions

Making the ideal management decisions requires an accurate, fast, and reliable estimation of the pest population density. If assessments are not carried out accurately, there is a considerable risk of making poor management decisions that result in the application of insecticides when it is not necessary or with insufficient frequency.

7. Drawback in Assessing the Suitability of Integrated Pest Management Strategies and Farmer Acceptability

Before the technological compatibility of various strategies is understood, researchers must create creative experimental designs to sort through the complex jumble of potential results. Determining whether farmers will adopt and implement the IPM strategy is far more difficult. Even the most strategically sound plan will fail if it

cannot be adjusted to local cultures, politics, and competing market forces. In the words of Levins (2007), "The ultimate goal of IPM is not the pest, or even the crop, but the viability of rural life as a whole and a safe, sustainable food supply in the face of numerous sorts and rising severity of uncertainty." The survival of the IPM system; however, depends on the farmers and regional cultures. Unless farmers and local communities remain the main emphasis, attempts to assess the compatibility and effectiveness of IPM approaches are essentially academic exercises.

8. Financial Issues

IPM has repeatedly been criticized for failing to provide a short-term financial advantage over conventional control, in part because to the high cost of labour. The challenges most frequently mentioned in relation to high expenses include complex monitoring and employee supervision. Implementation challenges may arise if farmers are not initially charged for these expenses. Implementing biological control elements in IPM programme is recognized as being severely constrained by financial issues. The meagerness or lack of profits from the sale of biological control agents, issues with patenting, and the difficulty of monitoring their efficacy exacerbate the lack of funding for extension and commercial development. The cost of developing selective pesticides is another barrier.

Conclusion

The key to IPM adoption is persuading farmers to use non-chemical alternatives (such as biological control, plant diversification) as primary management components and to apply pesticides sparingly and only when non-chemical alternatives are unable to manage pests population successfully. On farms with limited resources, IPM's effectiveness, uptake, and sustainability can all be improved through research, extension, and regulatory changes. The main difficulty is creating communication and support mechanisms that enable farmers with limited resources to explore, accept, and maintain IPM that increases yields and profits in the face of numerous uncertainties and difficulties. It needs encouragement to connect farmers to the technical resources needed to improve yields and earnings and reduce hazards to the agricultural community, and the environment through the use of information technology, media development, crowd-sourcing, and rural sociology.

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