

Participatory Integrated Pest Management in Rice - *A Sustainable Approach for Managing Insect Pests, Diseases and Weeds*

Rice production in India is constrained by a complex of insect pests, diseases, and weeds, often leading to excessive pesticide use, higher cultivation costs, and environmental concerns. To promote sustainable crop protection, the AICRPR conducted **participatory Integrated Pest Management (IPM) trials** across seven agro-ecological zones during **2019–2023**, involving scientists, extension personnel, and farmers in validating location-specific IPM modules under farmers' field conditions.

The IPM modules integrated resistant varieties, balanced crop nutrition, pest surveillance, conservation of natural enemies, biological and mechanical control, integrated weed management, and need-based pesticide application. Over five years, IPM consistently reduced the incidence of major insect pests by **20–70%**, disease severity by **30–80%**, and weed population and biomass by **25–70%** compared to farmers' practices. These improvements resulted up to **60% higher grain yield**, with additional yields of up to **1.5 t ha⁻¹**, while the **benefit–cost ratio increased from 0.88–3.29 under farmers' practice to 1.29–4.64 under IPM**.

The programme documented **26 farmer success stories**, demonstrating reduced pesticide use, improved crop health, conservation of natural enemies, and enhanced profitability. Farmers shifted from calendar-based pesticide applications to need-based decision-making through regular field monitoring and pest surveillance. The participatory approach strengthened farmers' knowledge and confidence, making IPM a practical, economically viable, and environmentally sustainable strategy for rice production. The validated **zone-specific IPM modules** are now ready for large-scale dissemination to enhance productivity, profitability, and climate resilience in rice-based production systems.

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