

Improvement of Livelihood of Tribal Farmers of Mizoram through Area-Wide Integrated Pest Management (IPM) in Rice: A Success Story

Rice is the staple food crop in Mizoram and is grown in valleys, terraces and uplands in hill slopes as *Jhum*. Large-scale cultivation of high yielding, fertilizer responsive and semi dwarf varieties led to large-scale outbreak of insect pests in rice. Over-reliance on the use of synthetic pesticides in management of insect pests around the world has resulted in disturbances to the environment, pest resurgence, pest resistance to pesticides, and lethal and sub-lethal effects on non-target organisms, including humans. Given the economic importance of rice in Mizoram and the losses incurred by insect pest infestation, it is important to adopt the area-wide Integrated Pest Management (IPM) of major insect pests of rice for an improvement of livelihood of tribal farmers of Mizoram.

ICAR Research Complex for NEH Region, Mizoram Centre, Kolasib, Mizoram has conducted a field demonstration under Tribal Sub Plan (TSP) to evaluate IPM against major insect pests of rice (cv. Gomati) for two years during 2014-2015 and 2015-2016 at Chemphai village, Kolasib district of Mizoram. The details of IPM module are as follows: (i) Pheromone traps @ 12 per ha for monitoring, (ii) Release of *Trichogramma* egg parasitoid @ 5.0 cc per ha per release on 30 and 37 days after transplanting (DAT), (iii) Application of entomopathogens @ 2×10^9 conidia per ml, (iv) Application of Neem oil @ 3.0 ml per litre of water, (v) Application of *Bacillus thuringiensis* (Bt) @ 2.0 ml per litre of water, (vi) Application of need based insecticides per litre of water such as imidacloprid @ 1.0 ml, quinolphos @ 2.0 ml, spinosad @ 0.25 ml, acephate @ 1.5 g, indoxacarb @ 1.0 ml, profenophos @ 2.0 ml, carbosulphan 2.0 g, chlorpyrifos @ 2.0 ml.



Installation of different pheromone traps @ 12 per ha.

IPM module consists of parasitoid, fungal pathogen, botanicals along with other management methods evaluated against insect pests on rice recorded a lesser population of insects as compared to farmer's practice and untreated check. The per cent reduction of insects'

population over unprotected condition was the highest in IPM module (74.81) than the farmer's practice (29.43). Maximum yield was recorded from IPM module (4.27 t/ha) as compared to untreated check (2.61 t/ha). The net profit and benefit cost ratio (BCR) were also higher in IPM module (1 : 2.34) than the farmer's practice (1 : 1.81).

IPM module as very effective by managing the insect pests in comparison to rice crop protected with recommended insecticide schedule and unprotected condition. IPM module recorded the highest number of natural enemies such as coccinellids, chrysopids, spiders, etc. Hence, the IPM can effectively used on rice to suppress insects population and to realize higher yield, net return and benefit cost ratio. After realizing the success of IPM and other beneficiaries in Chemphai village got motivated and they have started to adopt IPM in large scale covering 50 ha. of area. Thus, the interventions have improved the standard of living, livelihood and socioeconomic status of the villagers.

Source: ICAR Research Complex for NEH Region, Mizoram Centre, Kolasib-796 081, Mizoram