

Integrated Pest Management in Groundnut

AME Foundation is born out of a concern for ecological agriculture. Embedded in this concern are the livelihood improvements and ecological balances. Choosing to work with resource poor families in fragile ecosystems of dry farming, AMEF seeks to enable them to generate and adopt alternative farming practices, that are acceptable and affordable.

Sustainable agriculture (SA) in dry lands requires adoption of a bunch of practices pertaining to rainwater conservation, soil fertility improvement, diversified crop production systems, along with rebuilding of environmental support.

Over the years, AMEF has found certain alternative farming practices highly accepted by farmers. Such practices are considered here as Good Agriculture Practices eligible to be widely disseminated. **This good agricultural practice pertains to management of pests through integrated approach.**

AMEF firmly believes that while farmers alone are the practitioners of these options, as end users, there are several agencies working with them as enablers. This brief seeks to help the enablers to promote SA in their specific context.

In the dry lands of South India, the productivity of groundnut crop is affected by increasing incidences of pests and diseases due to variety of factors like mono-cropping leading to erosion of biodiversity, poor soil organic matter content and biological health and, indiscriminate use of chemical pesticides leading to pest resistance and destruction of natural enemies.

The indigenous practices of managing pests and diseases are disappearing following the introduction of chemical pesticides in the green revolution era. Most of the present day farmers often rely on input suppliers for advice and use chemical pesticides recommended by them. Besides crop failures, it is adding to the cost burden of resource poor farmers and reducing farm incomes.

Hence, alternative pest management practices assume greater significance in dry land cultivation of groundnut, today. Integrated pest management (IPM), increasingly seen as a viable option, involves the intelligent combination of different practices to manage the pests below the threshold level. Some of the important IPM practices include the use of tolerant varieties, cultural practices like deep summer ploughing, use of biologicals, alternative cropping system involving the use of trap/border/ecofeast crops, light trap, mechanical control and botanical extracts with chemical pesticides, as the last resort.

Tolerant varieties of crops withstand the pests and diseases attack. Farmers grow groundnut

varieties such as ICGV 86031, ICGV 2271 that withstand leaf miner (*Aproaerema modicella*) infestation.

Cultural practices like deep summer ploughing helps in exposing resting stages (pupae) of insect pests for predatory birds to feed on them. Red hairy caterpillar (*Amsacta albistriga*), an important pest on groundnut, is managed by summer ploughing practice.

Seed treatment with biologicals like *Trichoderma* helps in the prevention of seed and soil borne fungal diseases. It is used for the control of root rot caused by *Macrophomina phaseolina* and stem rot caused by *Sclerotium rolfsii*. Groundnut farmers are using *Trichoderma* for dry seed treatment @ 4 g per kg of seeds.

Cropping system approach helps in reducing the pests and diseases by creating unfavorable situation for their multiplication. Instead of growing a mono-crop, farmers adopt a combination of crops as alternative pest management practice. Growing three to four rows of bajra as border crop helps in reducing the spread of peanut bud necrosis disease (PBNB) by acting as a barrier for the virus vector, thrips from moving into the field from outside. Castor, grown on borders, acts as trap crop for tobacco caterpillar (*Spodoptera litura*). Use of biocontrol agents is another option available for the management of important caterpillar pests. Nuclear Polyhedrosis Virus (NPV) is applied @ 100 - 200 larval equivalent (LE) per ac to control red hairy caterpillar, tobacco caterpillar and gram pod borer.

Farmers grow ecofriendly crops like cowpea, bajra and niger to reduce groundnut leaf miner (*Protaetia modicella*), through the buildup of natural enemies like parasitic wasps and predatory lady bird beetles which feed on the aphids on cowpea. Some of the most preferred host plants of insect pests are grown as trap crop to divert the pests from the main crop.

Farmers in Pudukkottai district of Tamil Nadu use light traps along with bonfire for killing the adult moths of red hairy caterpillar before they laid their eggs on groundnut crop. Farmers in Bijapur district of Karnataka state practice dragging of the branches of the plant *Euphorbia agosyypina* in the groundnut field to reduce the incidence of leaf miner. The practice helps in opening of the groundnut leaves folded by the leaf miner larva and exposing it to predators. Adult beetles of root grub are collected and destroyed by shaking their host trees such as *Acacia* and neem between 7 and 8 pm in and around the groundnut field for first three weeks after heavy summer showers.

Farmers attract predatory birds to their crop fields for the control of caterpillar pests by broadcasting cooked rice or puffed rice in Northern Karnataka. Avoiding chemical pesticides enhances their activity and erecting 'T' shaped sticks serve as bird perches.

Farmers use neem oil, neem leaves, pongamia oil (*Pongamia pinnata*), *Vitex negundo* leaves for the control of insect pests. Neem seed kernel extract (NSKE 5%) has superior results over neem leaves or oil and has recently gained popularity among farmers for the management of leaf miner and other sucking pests. Farmers

in Karnataka state have found that the application of neem cake @ 100 kg per ac reduced the attack of root grub (*Lachnosterna serrata*, *Holotrichia* sp.) in groundnut.

Farmers are quickly realizing that IPM practices are economical and safe alternatives to chemical pest control. They reduce the cost of cultivation and at the same time provide lasting solution to the pest and disease problems. They help in conserving the biodiversity of the ecosystem and prevent contamination of ground water, soil and farm produce by pesticide residues. The use of IPM helps in better health status of the farm family, livestock and community. IPM has helped them to move towards ecological agriculture under dry land conditions.

AME Foundation promotes IPM as a viable option in addressing the pest and disease management problems of resource poor farmers in dry lands of Southern India.

Limitations

IPM measures need to be planned well before the start of the season to be effective. The quality and availability of the biological inputs is not in control of the farmers. The biological inputs work under certain favorable situations like temperature, moisture and humidity. NPV has to be applied, along with phagostimulant, UV protectant and wetting agent, during late afternoon for the virus to be effective. Further early detection is a key element in IPM and this involves knowledge about the various pests and diseases, beneficial organisms, symptoms of damage, etc.



Deep ploughing in summer



Bajra as border crop