



Non-Pesticidal Management: Fore Runner to Organic Farming & Zero Budget Natural Farming

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Abstract

Non-Pesticidal Management (NPM) is an innovative approach to pest management in crops. This approach entails the application of such pest control measures that do not warrant the use of chemical pesticides by farmers. NPM approach was evolved by Non-Governmental agencies in Andhra Pradesh through incorporating farmers' traditional knowledge and indigenous practices of plant protection and refining them. NPM constitutes a new package of management practices was evolved which came to be known as NPM practices that are ecologically sound, safe and cheap.

Keywords: Non-Pesticidal Management, NPM, IPM, agro-ecology,

Introduction

The book 'Silent Spring' written by Rachel Carson in 1962, is considered the landmark in changing the attitude of the scientists and the people towards complete reliance on the synthetic pesticides for controlling the pests in agriculture crops. Responding to the ill effects of pesticides on agro-ecosystem and human health, a new alternative approach was initiated in paddy cultivation through farmers' field schools. Integrated Pest Management (IPM) has been well accepted by farmers but it has not reduced their dependence on pesticides. Though IPM debates that pesticides are harmful, it still believes that pesticides are inevitable, at least as a last resort.

Traditionally, farmers have been using indigenous practices for pest control using locally available materials, that are ecologically compatible and sustainable. But those were brushed away locale specific and limited in scope. So, no one understood their worth did not make any effort to put all of them in a combined package. An effort to put together all the ecologically compatible plant protection practices resulted in a new approach called Non-Pesticidal Management (NPM). As the name suggests, growing crops without using any chemical pesticides is what is being done in NPM approach.

Non-Pesticidal Management (NPM)

Non-Pesticidal Management (NPM), is an approach where in no chemical pesticides are used in cultivating crops. Non-governmental agencies, with a concern for safety, health of farmers, have found that by integrating all these indigenous control measures, one can get a basket of techniques for effectively managing pests in a crop, without using any chemical pesticides. Thus this new approach was tried, first in cotton, as it was much more challenging and rewarding. Thus, a new package of management practices got evolved which came to be known as NPM practices that are ecologically sound, safe and cheap. When farmers were

explained the scientific reasoning behind these practices, they understood them and appreciated their worth in reducing costs of cultivation drastically.

Non-pesticidal management of crops involves applying sustainable solutions for managing the agro-ecosystem of field crops. It is a paradigm shift in moving from input centric model to knowledge and skill based model. It involves making best use of natural resources locally available and takes best advantage of the natural processes.

- Understanding crop ecosystem and suitably modifying by adopting suitable cropping systems and crop production practices. The type of pests and their behavior differs with crop ecosystem. Similarly, the natural enemies' composition also varies with the cropping systems.
- Understanding insect biology and behavior and adopting suitable preventive measures to reduce the pest numbers.
- Building Farmers knowledge and skills in making best use of local resources and natural processes and community action. Natural ecological balance which ensures that pests do not reach a critical number in the field that endangers the yield. Nature can restore such a balance if it is not meddled with too much. Hence no chemical pesticides/pesticide incorporated crops at all. For an effective communication to farmers about the concept effectively and to differentiate from Integrated Pest Management which believes that chemical pesticides can be safely used and are essential as lost resort it is termed as 'Non Pesticidal Management'.
- Among the four stages of the life cycle, insects damage the crop only in one stage (larval stage in most of the cases). At least two of the stages are immobile (egg and pupa). The adult stage will not harm the crop. So a question is asked here: *Is it sufficient to spray pesticides during larval stage?* (See Plate 1) There are several options available to control them at each of the stages, mostly using local resources, local expertise and knowledge.

Practices of the non-pesticidal management

- ❖ Deep ploughing in the summer to expose the insect pupas to heat of the sun and the predating birds.
- ❖ Using light traps and bonfires to attract moths at nights.
- ❖ Placing yellow and white sticky boards in the field to attract sucking insect pests.
- ❖ Hand-removing leaves on which many insect eggs have been laid. Hand removing of larvae and shaking plants to dislodge larvae.
- ❖ Setting pheromone traps to check on the numbers of pests in the field.
- ❖ Using biological pesticides decoctions and extracts such as neem seed-kernel extracts and chilli-garlic extracts to control bollworms and sucking insects. There are also other locally available plants to make biological pesticides.
- ❖ Using an extract made from cow dung and urine to control aphids and leafhoppers; this also acts as an organic fertilizer.
- ❖ Planting trap crops such as castor and marigold. Insects are likely to lay their eggs on these plants, where they can be picked off easily.
- ❖ NPM can reduce human and environmental exposure to hazardous chemicals, and potentially lower overall cultivation costs.

Agro-ecological Perspective of NPM

The main principles underlying the Non-Pesticidal Management are:

- A natural ecological balance will ensure that pests do not reach a critical number in the field that endangers the crop yield.
- Nature can restore such a balance if it is not meddled with too much; hence no chemical pesticides are used in crops at all.

- Understanding the insect biology and crop ecology is important to manage pests; it is not enough if reactive sprays are taken up during outbreak.
- Prevention rather than control/reaction is the key element to NPM.
- Crop diversity and soil health play an important role in pest management.
- Pest management is possible with local, natural materials.

NPM attempts to shatter some of the myths in the dominant paradigm of pest management prevalent in today's modern agriculture. These myths are enlisted here:

- "Pests can be controlled only by killing them"
- "All insects in the field are pests"
- "No relationship exists between mono-culture and pest incidence"
- "Chemical fertilizers and Pest incidence are not related"
- "Pest resistance is a genotypic issue than environmental"
- Resistance management is "about using newer and newer generation pesticides" [as per the pesticide industry and agricultural scientists] and "about using more pesticides, including pesticide mixtures" [as per the farmers]:
- "Prevention of pest/disease incidence is about spraying pesticides even when the pest is not present"
- "The benefits from the use of synthetic pesticides outweigh the risks"

Conclusion

Non Pesticidal Management (NPM) is an approach to crop protection based on pest and parasite population dynamics which maintains natural equilibrium and reduces the risk of damage by pests. NPM is regarded as the most effective option for large scale sustainable agriculture. With wide spread use of NPM methods in Andhra Pradesh and Telangana, pesticide consumption in these two states have has gone down drastically in the last 20 years.

References

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