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A CASE STUDY

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Preparation of neem biopesticides : A need of sustainable agriculture at farm level

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The scientific name for the neem of India is *Azadiracta indica*. It is also called as "free tree". Its fact is derived from Azad- Darakth a persian word. The Indian people have for millennia used this tree in agriculture, public health, medicine, toiletries, cosmetics and livestock protection. However, there is a threat that the "free tree" will no longer be free, because common people continue to derive its benefits to control the various pests from centuries into the future as they have done in the past. The technology and practices that are being promoted are aimed at rejuvenating local low-cost use of neem as a biocontrol agent. It is meant to serve as a sustainable-agriculture initiative.

Neem has attracted worldwide attention in recent decades mainly due to its bioactive ingredients that find increasing use in modern crop and grain protection. The practice describes a range of neem products such as the neem leaf extract, the neem seed kernel extract, the neem cake extract, the neem oil emulsion and also neem in combination with other plant extracts for the control of a variety of pests. The technologies using neem are extremely simple and these products can be made by the farmer in his own backyard. They have been tested in the farmers' fields and satisfactorily proven to be effective in controlling a wide range of pests. They have also been used in controlling stored grain pests.

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Biological effects of neem on insects:

The action of neem products as pest control agents can be manifested at different levels and in different ways. This is a very important point to be noted since the farmer would be used to the knock-out effect of chemical pesticides. Neem extracts do not exhibit this type of effect on pests but affect them in several other ways.

Insect growth regulation:

Regulation of the insects' growth is a very interesting property of neem products which is unique in nature, since the products work on juvenile hormones. The insect larva feeds and as it grows, it sheds its old skin. This particular shedding of old skin is the phenomenon of ecdysis or moulting and is governed by an enzyme, ecdysone. When the neem components, especially azadirachtin, enter the body of the larva, the activity of ecdysone is suppressed and the larva fails to moult, remains in the larval stage and ultimately dies. If the concentration of azadirachtin is not high enough, the larva will die only after it has entered the pupal stage. If the concentration is lower still, the adult emerging from the pupa will be 100% malformed, and absolutely sterile.

Feeding deterrent:

The most important property of neem is feeding deterrence. When an insect larva sits on a leaf, it will want to feed on it. This particular trigger of feeding is given through the maxillary glands. Peristalsis in the alimentary canal is thus speeded up, and the larva feels hungry and starts feeding on the surface of the leaf. If the leaf is treated with a neem product, because of the presence of azadirachtin, salanin and melandriol, there will be an anti-peristaltic wave in the alimentary canal which produces something similar to a vomiting sensation in the