

## Organic Pest Management Strategies in Kitchen Gardens of Assam: Enhancing Vegetable Crop Health and Yield

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### Abstract

Indian kitchen gardening is deeply ingrained in the culture, serving as a means of passing down customs and identity of culture from one generation to the another. In Assam, this method is very popular in both rural and urban areas, where a wide range of fruits, leafy greens, root vegetables, and tubers are grown for family consumption. Beyond its cultural significance, kitchen gardening is essential for enhancing self-sufficiency, food security, and sustainable and healthy living. This research explores different ITK (Indigenous Traditional Knowledge) aspects of Assamese kitchen gardening.

**Keywords:** kitchen garden, ITKs, organic farming, pest-disease, management

### Introduction

For generations, kitchen gardening has been an important aspect of Indian culture. It is a practise that has been passed down through generations, instilling a sense of tradition and cultural identity in the participants. Kitchen gardens are an essential component of agriculture, which is an important aspect of the economy and daily life. They improve food security, encourage self-sufficiency, and support sustainable and healthful living habits. In Assam also, kitchen garden is very popular in rural as well as in urban areas where mostly different type of tubers, leafy and root vegetables and some fruit crops are grown for family needs.

A kitchen garden, also known as a vegetable garden or home garden, holds significant importance for several reasons:

- 1. Food Security:** Kitchen gardens contribute to household food security. They provide a steady source of fresh, organic vegetables and herbs, reducing the dependence on market-bought products and helping families save money.
- 2. Nutrition:** Growing our own vegetables ensures access to fresh, nutritious, and chemical-free food. It helps in diversifying the diet, as one can cultivate a variety of vegetables, ensuring a balanced intake of vitamins and minerals.

3. **Cost Savings:** Maintaining a kitchen garden can lead to substantial cost savings. Home grown vegetables are often cheaper than store-bought ones, and the initial investment in seeds and gardening supplies can pay off over time.
4. **Reducing Food Waste:** Kitchen gardens help reduce food waste. One can harvest what is needed, reducing the chances of food spoiling or being thrown away.
5. **Environmental Benefits:** Home gardening promotes sustainable and organic farming practices. In addition to improving soil health and lowering the use of synthetic pesticides and fertilisers, organic farming lowers the carbon footprint associated with transporting vegetables from farms to markets.
6. **Income Generation:** Surplus produce from a kitchen garden can be sold or traded locally, generating a supplementary income for the household.
7. **Teaching and Learning:** Kitchen gardens offer a practical and instructive platform for teaching children about biology, environmental science, and sustainability as they learn about plant lifecycles, the importance of soil health and how ecosystems work. It also impacts physical and mental health.

In Assam, mostly fast-growing vegetables like brinjal, chilli, okra, tomato, cucurbits, tuber crops, leafy and root vegetables and fruit crops *viz.* banana, papaya, pineapple etc. are grown in kitchen garden in the households to meet the daily needs. In kitchen garden mostly local cultivars are used which required less nutrients and fertilizers and also resistant to many pests and diseases but yet susceptible to different insect-pests and diseases where each crop faces its unique set of insect pests, demanding customized approaches for pest management. Usually, chemical pesticides or fertilizers are not used in kitchen garden for sustainable approach therefore many ITKs have been practicing to control these insect-pests from the time immemorial by the different indigenous communities in Assam. These practices mostly involve the use of natural, organic, and sustainable methods and proved to be very effective against wide range of insects-pests. Here are some indigenous and organic control practices for insect-pest management in kitchen gardens in Assam:

#### **Understanding Indigenous Technical Knowledge:**

Indigenous technical knowledge (ITK) refers to the traditional and time-tested practices and techniques that indigenous communities have developed and refined over generations to manage various aspects of their environment, including agricultural pest management. Assam

is home to numerous indigenous communities with deep-rooted knowledge of local ecosystems, making them a valuable resource for sustainable pest management strategies.

- 1. Maha neem leaf boil in water:** The fresh leaves of moha neem tree (*Melia azedarach*) is widely used in Assam for pest control. Freshly collected matured leaves that is free from any diseases are boiled in water for one or one and half hours in a metal container. This process will transfer all the chemical compounds present in the leaves to the boiled water and the water can be used as spray against different insect-pests. The bitterness and insect-repellent properties of maha neem act as a deterrent for many pests. It works against all type of insect-pests.
- 2. Wild fern mixed with cow urine:** Fresh leaves of wild fern, free from any contamination are collected and wash to remove dirt. Now grind the leaves to take out its sap, then mix the plant sap with cow urine in a bucket and make a suitable treatment to spray directly in the infected plants. Due to its strong aroma, insects do not feed in the crop plant, it works as a repellent to the insect-pests.
- 3. Burning of paddy straw and dry chilli:** Smoking by burning of dry chilli and paddy straw under a quadrangle bamboo structure that is used as stand for creeping and vining crops especially for cucurbits ( in assamese called “hendali”) to repell gravid female of fruit fly (*Bactrocera cucurbitae* Coquillett) as it lies egg inside the newly developed fruit of cucurbitaceous vegetables. This practice is also applied in tea plants by small tea growers and succeeded in repelling different insects.
- 4. Tobacco leaves:** The fresh leaves of tobacco is soaked in a container for 24-48 hours in the water and kept it for fermentation. After the fermentation period, remove the solid residue and the water is use as spray in the infected crops. It works as antifeedent against different type of chewing and sucking insect-pests. The using of tobacco leaves is prohibited in organic farming in most of the regions and farmers and households are unaware about it though some people considered it as a eco-friendly category pesticides.
- 5. Using phoot chai (Fly ash):** Fly ash or photo chai is commonly practiced by most of the household and farmers in the crops like potato and brinjal that is grown in the kitchen garden. It is mainly applied in the base of crop plants to control pests like epilachna beetle (*Henosepilachna vigintioctopunctata* Fab.) and red ant (*D. orientalis*)



in potato crop. In Brinjal it is applied to repel the Epilachna beetle as well as nourish the plants with potash, thereby boosting tolerance to the pests.

6. **Using turmeric powder to prevent red ants:** Red ant infestation is another major problem in Assam which causes severe damage to vegetable crops. To combat this problem farmers in some places use turmeric powder to get rid of them.
7. **Eradicate infected plants:** Regular inspection of the plants and manually remove insects and their eggs. This is especially effective for larger pests like caterpillars. If the infestation is more severe, complete removal of plants is done to stop the spread to the other crops. Complete eradication will directly effect in the yield but it will help to prevent insect-pests infestation in the subsequent planting seasons.
8. **Garlic-onion spray:** Garlic and onion extracts are effective against a wide range of insect pests and diseases. Crush and soak garlic or onion in water, strain the liquid, and spray it on plants to deter insects. It is highly effective against fungal diseases of crop.
9. **Trap crop:** Planting of specific trap crops to divert pests away from the main vegetable crops has been practicing since ancient time. For example, planting mustard as a trap crop can attract aphids away from other vegetables in the kitchen garden. Marigold plants are often inter-planted with vegetables as they emit a scent that repels certain insects. They can serve as a natural pest deterrent

### Conclusion:

Indigenous technical knowledge in pest management for horticultural crops in Assam has immense potential in addressing the challenges posed by various insect pests. It is important to note that the effectiveness of these organic practices may vary depending on the specific vegetable crops, the local pest population and the environmental conditions of a kitchen garden in different region. More research is demanded to extend the use of these organic control practices and ITKs in plant protection and can be further more analyse and use to promote sustainable agriculture. Current policies by government to minimise the use of synthetic pesticides and fertilizers it will be a good opportunity by harnessing the rich indigenous knowledge of Assam, we can pave the way for a more sustainable and pest-resistant horticultural future.

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