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# Agricultural pest management using traditional knowledge – Case studies of Korora village under Kamalpur Subdivision of Kamrup (Rural) district and Saikiapara & Gadhiapara villages of Mangaldai under Darrang district, Assam

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**Abstract**
Agricultural practices have been seeing transformation from age old traditional practices to the present-day advanced procedures. But the indiscriminate use of chemicals for increasing production as well as for controlling pest population has rendered the soil less fertile and has created resurgent pest population with resistive strains. Notwithstanding, the traditional understanding about crop protection from pests infestation can be used along with modern techniques, to reduce the dependency on chemicals. Keeping this in view a survey was carried out in Korora village under Kamalpur subdivision of Kamrup district and Saikiapara & Gadhiapara villages of Mangaldai under Darrang district to collect and document the knowledge about traditional practices of pest management. It was found that the people used this knowledge right from sterilization of the seeds before sowing through harvesting of the crops to protect against pests such as thrips, rice stem borer (*Scirpophaga sp.*), rice hispa, rice Gandhi bug (*Leptocorisa sp.*) and stored grain pest as rice moth (*Sitotroga cerealella*), rice weevil (*Sitophilus oryzae*) etc. It was also observed that, though the people possessed knowledge about traditional practices of pest management majority of them do not practice it and some of them which use these techniques are small land holding farmers.

**Keywords:** Traditional knowledge, harvesting, pest management, sterilization

## 1. Introduction
Traditional farming practice by a community is a system of farming based on the community's accumulated knowledge through generation after generation of cultivating various crops in their own unique way in adaptation to the surrounding environment. The indigenous farming system which was once prevalent all over the world is now almost vanished from the developed countries and confined to some tribal dominated regions of developing countries (Thurston, 1992) [7]. The traditional knowledge varies from one community to the other and usually passes on to the next generation through the words of mouth and practices, usually by the elders of the family or society (Chhetry *et al*., 2008). The traditional knowledge, possessed by the community esistime tested through the method of trial and error and is also ecologically protective and environmentally safe.
Indiscriminate use of chemicals for increased crop production owing to feeding pressure from the growing population and for controlling crop pest has rendered the soil less fertile and has given rise to resurgent pest populations with resistive strains. As a result, there is a renewed interest in employing the age-old farming techniques re-enforcing them with modern scientific approach which is also known organic farming.
Assam is rich in traditional farming practices as it is an agricultural dominated society and because of diversity in agro-ecological habitats inhabited by diverse ethnic groups who have been practicing age-old farming in location specific situations since generations (Chhetry *et al.,* 2008).
Keeping this in view, a survey was carried out in Korora village under Kamalpur sub-division of Kamrup district Saikiapara & Gadhiapara villages of Mangaldai under Darrang district to collect and document the knowledge about traditional practices of pest

management so that, it may be helpful for scientist and researchers to integrate this knowledge to overcome the deficiencies in modern agricultural system.

## 2. Methodology

Extensive surveys were carried out in farming households in Korora village under Kamalpur Subdivision of Kamrup (Rural) district and Saikiapara & Gadhiapara villages of Mangaldai under Darrang District, Assam from July 2015 – May 2016 and information was obtained using interview and questionnaire method as described by Deka *et al*., (2006) [4]. The questionnaire included the following

a) Do you know about traditional farming practices and does it include protecting crops from pest?
b) If you know, where from have you come to know?
c) Do you follow these traditional practices for protecting your crops from pest damage?
d) If yes, how do you apply them?
e) If not, what are the reasons?

## 3. Results and discussion

From the survey, it was found that most of the farmers were aware of the traditional farming practices involving pest management. It was observed that the people received the knowledge from their forefathers and from the society. During the survey it was found that large land holding farmers generally ignore and overlook these traditional techniques as these are thought to be time consuming and there is pressure for good harvest. The farmers who practice these techniques use them right from sterilization of the seeds before sowing through harvesting of the crops to protect against pests such as thrips, rice stem borer (*Scirpophaga sp*.), rice hispa, rice Gandhi bug (*Leptocorisa sp*.) and stored grain pest as rice moth (*Sitotroga cerealella*), rice weevil (*Sitophilus oryzae*) etc.

The following discussionist forwarded to give a complete picture of how the traditional techniques are used for prevention of pest by the local people.

For sterilization of seeds before sowing, the farmers immerse the seeds in salt water. One teaspoon of salt is mixed with one liter of water and seeds are kept immersed for two days before sowing.

A find of the survey was the use of a bio-fertilizer cum pesticide locally known as 'Pochon khar'. For making the bio fertilizer, a trench of 10 ft long, 5 ft wide and 3 ft deep is dug inside of which, vegetable waste, 'pani meteka' (*Eichhania crassipes*), 'gobar' (Cow dung) are added. Along with this, urea @ 2 kg/ 2 ft of waste is mixed which helps in its decomposition. The mixture is then covered with banana leaves (*Musa spp*.) and soil and kept undisturbed for 2-3 months. The preparation is made in such a way that it is ready for use just before sowing the seeds. The mixture is spread on the farm land and ploughed before the seed is sown. Apart for acting as a bio fertilizer, it is reported to act as a deterrent to thrips and rice stem borers

A traditional pesticide made from steam decoction of neem leaves (*Melia azadirachta*) along with barn oil cakes, locally known as 'Kholia' and domesticated tobacco leaves (*Nicotiana sp.*) is used. These three ingredients are first grinded together and boiled. During boiling, fumes are produced which is used in fumigation of the crops and after that, the extract is sprinkled on to the field and crops. It was reported that it is effective in prevention of infestation of thrips, rice stem borers and rice hispa.

An interesting traditional pesticide used recorded during the study was an extract made from wild tobacco leaves (*Nicotiana rustica*) along with seeds of neem (*Melia azadirachta*), bokul goch (*Mesua ferrea*) and the bark of soitan goch (*Alstonia scholaris*) mixed along with ash. This extract is sprinkled upon the crops and is said to protect the crops from the attack of thrips, rice stem borers, rice hispa and rice Gandhi bug.

The use of raw cow dung slurry is also used by the local people, which they believe acts as fertilizer and also prevents the attack of thrips.

Before harvesting, the farmers erect bamboo poles in rows to provide resting place for different kinds of birds and most of them are said to have an appetite for adult moths of stem borer and swarming caterpillars.

At night the farmers burn husk or make fire traps by lighting cycle tyres on fire which attracts insect pests and leads to their death.

Other noteworthy traditional methods that were recorded during the survey were the spraying of goat dung slurry, hanging of dead frogs in the field, mixing of dry fish with water and the mixture is sprayed at the base of citrus plant, spreading of a thin coat of wood ash on vegetable crops and spraying of lime water before cultivation.

## 4. Conclusion

The growing population needs more food but the agricultural land is not increasing proportionately rather it is decreasing. So, the use of fertilizers for crop production is unavoidable. But, the traditional knowledge about pest management integrated with scientific method can be employed to check the indiscriminate use of pesticides, which in long run can be helpful in protecting the soil health and keeping the pest population below sustainable levels. This systematic approach not only protects this fast disappearing indigenous traditional knowledge under the influence of modern agriculture but also preserve the indigenous pest and disease management identity of farming communities of this country (Chhetry *et al.,* 2008).

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