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Indigenous technical knowledge for pest, disease and weed management in agriculture

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Abstract

The present study was conducted with the objective of identify and document the existing indigenous technical knowledge of tribal's in agriculture and allied field covering a sample of 120 tribal farmers. Documentation of ITK was done using primary and secondary source of information. The major documented indigenous knowledge was under the following sub-title; pest management, disease management and weed management.

Keywords: Indigenous knowledge, tribal

Introduction

Indigenous Technical Knowledge (ITK) is the product of centuries of trial and error, natural selection and keen observation that can form the knowledge base on which researchers and extension workers can plan their research strategy and experimental procedures. 'Indigenous' implies that, it is generated by local traditional knowledge, external actors, agencies and individual innovations. 'Technical' denotes the fact that this is specific knowledge that some people have as a result of their experience in a particular subject area. Thus, peoples' knowledge is more detailed than that of others, who have not had the same experience or do not have the same skills in observation or analysis (Sankaran, 2005) [8].

Indigenous Technical Knowledge (ITK) that helps people to overcome uncertainty and prepare for possible adverse or favourable events. Local indicators and local knowledge systems cannot be replaced with scientific knowledge, because they are holistic and specific to local situations, providing farmers and others with the ability to make decisions and prepare for the coming agricultural year.

The knowledge related to indigenous traditional is depleting day by day because of lack of consciousness about its value and impact, as well as proper documentation. There is an urgent need of effort to document such valuable information for the welfare and betterment of society.

Therefore, there is need to study, identify, document and share, some of the specific experiences of the tribal farmers collected during the field work at grass root level of programme areas.

Materials and Methods

The present study was carried out during 2017-18 in Chhindwara which is the leading district in tribal population (36.82%) of Madhya Pradesh. Chhindwara district comprises of 13 blocks out of which, Tamia block was selected purposively for study because of having higher tribal population. Three villages viz. Sajkuhi, Dhurwa dhana and Khamra jethu from Tamia block were selected randomly. Finally, 40 tribal farmers from each village were selected randomly. Thus a total of 120 tribal farmers comprised the sample for the present study. Documentation of ITK was done using pretested interview guide. The questions and statements were asked in vernacular i.e. in Hindi the local language. Major documented indigenous knowledge as revealed by present study was as follows:

Documentation

Insect-Pest management

1. Deep ploughing in summer is helpful in preventing from soil burrowing nematodes, white grubs, etc.

2. Burning of waste material in field to produce the heat. The heat which is produced by burning of waste material sterilizes the soil and kills the harmful microbes and controls damping off in nursery. It is practiced in late *kharif* and summer.
3. For insect control, spraying of diluted onion or garlic juice is used by tribes to control grasshopper and other leaf inhabiting insects on Maize crop.
4. Spraying *neem* solution to control all type of insects in crop. The solution of *neem* leaf extract and water is ratio of 1:6.
5. *Bhelama* (*Anacardium* spp.) stem twigs are being adopted by the tribal in transplanted rice for protecting the incidence of rice gundhi bug.
6. Fermented solution of 5 kg cow dung, 5 litre of cow urine, 150 gm lime + 100 litre of water is sprayed to control aphids, bacterial and viral diseases.
7. Maize cobs without seed are pierced in standing crop filled to control bumpy insect (*Nemphula depunctalis*).
8. Kerosene oil mixed water is poured in standing *kharif* crop field especially in rice field, and plants are thrilled by a long rope synchronously. All the insects like hoppers fell down in that water and dead.

Disease management

9. Tribal farmers use fermented solution of 5 kg of cow dung, 5 litre of cow urine, 150 gm lime + 100 litre of water to control khaira disease, bacterial and viral diseases in paddy.
10. To control the papaha disease (tip burn) of paddy, farmers drain out the standing water from the field.
11. Cowdung is mixed with water thoroughly and kept for 3-4 hours till the course materials settle down. The solution on top is filtered and sprayed on paddy leaf for control of bacterial blight. Bactericidal action of cowdung helps reduce the population of the bacteria (*Xanthomonas* sp.)
12. To control blight disease, *mahua* (*Madhuka indica*) cake (100 g) is mixed with 1 litre of water. The extract is mixed with washing powder and spraying is done. Smoke of *mahua* is also used for bacterial blight. About 3% *neem* oil extract and 3% *mahua* cake @ 1:1 ratio is also prepared and sprayed for control of pests.

Weed management

13. *Nirai* or *godai* method is used by the tribal farmers. In this method, they use *khurpi* for removal of weeds from field.
14. Deep summer ploughing also known as *Khurra-Bakhroni* (ploughing) in summer or after *rabi* also exposes the weed seeds to sun and destroy them.
15. Farmers of the research area use ploughing in standing crop. This is the most common method in low land paddy. Ploughing in the standing paddy crop of one fourth to one and a half month after transplanting is done in the water filled field. A narrow *desi plough kud nagar* is used for this purpose by which paddy crop is ploughed and it falls on field. Weeds are uprooted and get decomposed in soil.
16. In some crops especially in *kharif* season, farmers use hand weeding as a method by uprooting the seeds from soil.
17. Farmers of the area manually separate the weed seeds from the crop seeds/grains.

Conclusion

The documentation of ITKs showed richness of time tested traditional knowledge applied for pest, disease and weed management. Though, all the documented ITKs have been found effective in management of pest, disease and weed in agriculture they need to be validated scientifically.

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