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ITK-based approach for sustainable production of onion in Odisha

BB SAHOO, S DAS*, P TRIPATHY and DK DASH****

Regional Research Technology Transfer Station
Semiliguda, Koraput 763002 Odisha, India
***College of Agriculture (OUAT), Sambalpur 768025 Odisha, India**
****Department of Fruit Science and Horticulture**
College of Agriculture, Orissa University of Agriculture and Technology
Bhubaneswar 751003 Odisha, India
Email for correspondence: bibhutihort@rediffmail.com

ABSTRACT

Indigenous knowledge (IK) is the local knowledge that is unique to a given culture or society. It has been accumulated over centuries and has potential value for sustainable development. It helps people learn how to live in harmony with nature in a sustainable manner. Indigenous traditional knowledge (ITK) consigns to mature, long standing traditions and practices of local communities. The enhancement of the quality of life of the Indians who in great majority live in and depend on agricultural production systems would be almost impossible if this rich tradition of ITK is kept inside. The collection of indigenous knowledge is of great significance in maintaining sustainability of production as well as the environment. The present study was conducted on farmers' practices associated with onion in four districts of Odisha. Some of the ITK practices being adopted by the farmers were use of rolling barrel, use of cassia leaves, ash, storing in mesh bags, jackfruit bark and storage bins, hanging onions for enhancing storage life and using plant extracts, kerosene, ash and moving gunny bags over the crop for the control of insect pests and diseases.

Keywords: Indigenous traditional knowledge (ITK), Onion; sustainability; storage

INTRODUCTION

The dissemination of modern practices has led to loss of indigenous practices and has eroded to a large extent over the years but the advent of the concept of sustainable agriculture in late eighties in Indian agriculture has evoked interest in ITK. Indigenous knowledge has been accumulated over centuries and has potential value for sustainable development. Over centuries Indian farmers have learnt to grow food and to survive in difficult environments where the rich tradition of ITK has been interwoven with the agricultural practices followed by them. It

can help other people learn how to live in harmony with nature in a sustainable manner. Indigenous traditional knowledge (ITK) consigns to mature, long standing traditions and practices of local communities. The enhancement of the quality of life of the Indians who in great majority live in and depend on agricultural production systems would be almost impossible if this rich tradition of ITK is kept inside. Problems associated with indigenous people and indigenous knowledge have had far-reaching or serious impacts on development endeavours. A growing body of evidence indicates that one of the main reasons why conventional development approaches have failed is that they have tended to ignore the indigenous knowledge systems. This has led many people to argue that in order to ensure a more socially and ecologically sound approach to development it is necessary to understand, respect, value and utilize the indigenous knowledge systems.

Indigenous knowledge (IK) is the local knowledge – knowledge that is unique to a given culture or society. IK contrasts with the international knowledge system generated by universities, research institutions and private firms. It is the basis for local level decision making in agriculture, healthcare, food preparation, education, natural resource management and a host of other activities in rural communities (Warren 1991).

Largely in India and especifically in Odisha where majority of farmers are small and marginal managing small production system and ensuring household food security with a lot of difficulty ignoring profitability, the ITK finds its larger applicability. Spices like onion and garlic play an important role in daily diet of resource poor farmers of Odisha. Kalahandi, Balangir, Baragarh, Nuapada, Sambalpur, Anugul, Deogarh are the leading onion producing districts in the state. In this back ground a study was conducted to collect and document ITKs related to onion which can subsequently be used for technology blending leading towards a sustainable production of the crop.

METHODOLOGY

The study was carried out under All India Network Research Project on Onion and Garlic operating at College of Horticulture, OUAT, Chiplima Sambalpur, Odisha. It included the collection and documentation of indigenous knowledge from the onion growing belt of Odisha (districts of Kalahandi, Balangir, Baragarh, Nuapada, Sambalpur, Anugul and Deogarh).

For collection and documentation, the methodology adopted has been given as under:

Identification and collection of information: Documentation of oral

histories, agro-ecosystem analysis, manual discriminative analysis (asking farmers to discriminate practices and find rationality), use of local resource persons, conducting documentation workshops, continuous interactions during on-farm experiments, local taxonomy, crop histories, in-depth interview of farmers and survey method.

Documentation: Documenting large variety of practices without scientific validation, documenting prevalent practices and comparing them with traditional ones, documenting the practices/details of experimentation on a specific aspect and understanding the various linkages and documenting the practices evolved to mitigate specific problems of farming

Methods of recording: Identification of indigenous specialists, case studies, field observations, personal observations, interviews, group discussions, historical composition, seasonal pattern chart, taxonomies, cassette documentation, photo/ slide and participatory video

Analysis: For analysis of collected and documented ITKs the parameters like IK-based, extent of use, prevent losses, eco-friendly, easy to handle, severity of problem, innovativeness, availability of input, rationality, cost effectiveness were followed and accordingly practices were categorised for further analysis that is validation and standardization.

RESULTS and DISCUSSION

The ITKs collected are given as under:

General management practices

Rolling barrel increases onion productivity: An empty barrel is rolled over onion crop to increase productivity. This is done 15–20 days before harvesting of matured bulbs mostly in Kharif onion. Usually a 20 litre capacity barrel is used. This causes the onion plants to lean ever to their side and the nutrients from the leaves are transferred to the roots thus increasing the yield. This method also increases the storage life of onions.

Enhancing productivity of onion: Farmers use decomposed cassia leaves (75 kg) with cowdung slurry (125 kg) for improving the colour, number and size of onion bulbs. There is 25-30 per cent increase in yield with this practice.

Improvement in the yield by application of ash: Fuelwood ash is used by the farmers that contains potassium (K) which improves the yield of bulb crops like onion.

Safe storage practices

Storing onions in mesh bags: Onions are stored in mesh bags in hanging method. Storage losses were recorded 10–15 per cent less in this method of storage.

Use of storage bin: A storage bin is prepared by the farmers for effective storing of onions. The size of the bin is 10 x 3 x 2.5 inch with a storage space of 75 cubic feet to accommodate 10 quintals of freshly harvested onion. The bin frame is made up of wood and its side walls as well as roof are covered with solid bamboo or wooden bars fixed at a distance of 1 inch. The top roof acts as a lid. The bin is placed in the house at a height of 1 foot from the ground level. One per cent carbendazim treated onion bulbs can be stored in such bins for 4-5 months at a minimum weight loss of 5-7 per cent. The practice is followed in Sundargarh and Kalahandi districts of Odisha where there is a postharvest loss of about 20 per cent in onion during storage, out of which the rotting is estimated to be 10-15 per cent whereas sprouting loss is 5-7 per cent.

Onion storage in jackfruit bark: By using this storage structure onion can be stored for 3 to 12 months. To provide good ventilation this storage structure is built in open space exposing it to the sunlight. Onions are well protected from insect pests and diseases.

Hanging of onion: For safe storage onion is dried and cleaned and selected onion bulbs are taken along with leaves. This onion bunch is horizontally hung on the roof top. Onion is kept horizontally. This method provides good aeration and keeps onion free from pests and diseases. Hanging of bunches facilitates easy circulation of fresh air and there is no secondary infection. These onion bulbs are used for sowing as well as for cooking purposes. Bunching of local small onion and hanging to the roof enhances shelf-life as hanging prevents rodent damage and the higher temperature and air circulation near the roof has a curing effect.

Plant protection practices

Control of onion thrip: The aquous extract of leaves of *Calotropis giganta, Vitex negundo, Aloevera* and *Azadirachta indica* is used by the farmers to control thrips in onion. The extract is with 5 litres of cow urine and kept for 10 days in shade. After 10 days the mixture is filtered and 1 litre filtrate is mixed with 12 litres of water. This mixture is sprayed 3 times a week for controlling thrips in onion.

Control of semilooper: For controlling semilooper in onion farmers spray kerosene oil and ash on the crop. Kerosene and ash act as sticking materials which minimize movement of the pest resulting in reduction in crop loss.

Control of blight: Farmers move empty gunny bag over the onion crop in the field early in the morning and irrigate the crop immediately. It is believed by the farmers that due to this operation attack of blight on onion crop is minimized. The scientific reason behind it is that due to moving of empty gunny bag over onion crop the moist portion on the tips on onion leaves is

minimized. Moist portion on the leaves is congenial for sporulation of fungus/bacteria which results in *Alternaria* disease of onion. Low temperature is also congenial to sporulation of *Alternaria*. Due to irrigating the crop early in the morning the sporulation is minimized.

CONCLUSION

In spite of advancement in scientific knowledge in agriculture, ITK-based practices still remain in use by the vast majority of the farming community particularly in resource poor farming situations without the knowledge of their scientific rationality. In this context blending of indigenous knowledge with modern scientific technologies is the need of the day to support sustainable development of agriculture and allied sectors in our country.

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