

Indigenous storage practices in pulses

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Received 27 July 2005; revised 22 September 2005

Indigenous knowledge is the accumulated knowledge, skills and technology of the local people, derived from the direct interaction of human beings and their environment. An investigation was undertaken to document the indigenous post harvest technologies in pulses. The study was conducted in dry farming tracts of Tamil Nadu. Documentation of indigenous storage technologies was done by direct interview and group discussion methods. In this paper, the indigenous storage practices adopted by the dry land farmers were identified and documented.

Key Words: Indigenous technologies, Indigenous storage practices, Traditional storage, Pulses storage, Dry farming, Indigenous pest management, Pulses storage pests control

IPC Int. Cl.:⁷ A01F25/00

Indigenous practices play a vital role in sustainable agriculture. Indigenous knowledge is unique to a given culture of society; this knowledge is the information base for a society. Indigenous knowledge refers to the unique, tradition, local knowledge existing within and developed around a particular geographic area¹. Pulses are the dried edible seeds of cultivated legumes and belong to the family of peas, beans and lentils. The protection of stored agricultural products against insect attack is essential for safe and steady supply of high quality food. Insect damage in stored grains and pulses may amount to 10-40%. In the past, insect infestation was often a less serious problem because farmers cultivated traditional varieties, which although low yielding, were generally more resistant to attack by insects. However, the introduction of high yielding grain and pulse varieties has resulted in increased storage losses, as these varieties are usually susceptible to insect damage. Hence, storage of pulses without pest infestation is essential. Indigenous practices has advantages over outside knowledge, it is cost effective and readily available. Indigenous knowledge systems and technologies are found to be socially desirable, economically affordable, sustainable and involve minimum risk to rural farmers and producers. Hence, the present study was undertaken to document the indigenous storage practices adopted by the dry land farmers in pulses.

Methodology

The study was conducted in dry farming tracts of Tamil Nadu. Survey was conducted in Coimbatore, Erode, Virudhunagar, Salem and Dindugal districts of Tamil Nadu. From these districts, few villages were selected based on the crops grown and area under dry farming for identifying the indigenous post harvest technologies adopted by the dry land farmers in pulses. Documentation of indigenous technologies was done by direct interview and PRA methods.

Results and Discussion

Pulses are an important crop in dry tracts of Tamil Nadu. Pulses being a protein rich crop were highly preferred by the farmers. The practices of storing pulse grains varied widely among the farmers. Farmers evolved various storage techniques to avoid storage pest infestation in pulses by using their indigenous knowledge. Eight such indigenous storage practices identified are discussed below:

Indigenous storage practices

1 Storage of pulses with *Naithulasi* and chilli

After the pulse crop is harvested, pulse grains are sun dried, cleaned and packed in jute gunny bags. To repel the storage pests, farmers keep a weed plant, *Naithulasi* (*Ocimum* sp.) and chilli fruits (*Capsicum annum* Linn.) with pulse grains (Fig. 1). The strong odour of *Naithulasi* and astringent smell of chilli fruits control the storage pests like pulse beetle, lesser

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grain borer, flour beetles, etc., Nearly, 60% farmers in Devarayapuram village of Coimbatore taluk and Coimbatore district had adopted this technology. Farmers found this practice to be cheap and effective in controlling most of the storage pests in pulses is up to 60% and also shelf life of the stored pulse grains increased up to 2 years. This indigenous practice is highly feasible among the small and marginal farmers since this practice involved no cost.

2 Neem leaves against storage pests

Farmers practiced an indigenous method of keeping neem leaves along with the stored grains of pulses in gunny bag to control the storage pests like pulse beetle, pod borers, etc. (Fig. 2). Neem leaves are known to have insecticidal property, to control any storage pests. Nearly 50% farmers of Nochikuttai village, Bhavanisagar block in Erode district adopted this indigenous storage practice in pulses. Neem leaves when added with the grains during storage, repel storage pest effectively. Farmers found this method to be very economical and effective in protecting the pulse grains from storage pests during storage. Grains could be stored in this method even up to one year. This indigenous storage method of pulses is highly feasible and accepted among the farmers of different agro climatic zones of Tamil Nadu.

3 Storage of pulses with sand

Storage of pulse grains after harvest varied among the farmers of different village. Farmers of Vattamalai village, Kangayam taluk and Erode district practiced an indigenous storage method using bamboo baskets and river sand. Keeping the pulse grains between the layers of sand (Fig. 3) in the bamboo basket. The airtight compact condition prevailing inside the basket would not provide a suitable living condition for storage pests. Baskets were lined with cow dung paste prior to its use in storage. This will avoid spilling of grains from the holes in the basket and before storing the grains were dried in sunlight. About 40% pulse growers had adopted this indigenous storage practice in this village. When grains were stored in bamboo baskets with sand its shelf life and keeping quality increased up to 80%. This practice was cheaper because it needed no seed treatment.

4 Mixing of pulses with coconut oil before storage

The practice of storing pulse grains varied widely among the farmers. One of the storage practices adopted by the farmers of Malamanoor village,

Mecheri taluk and Salem district was oil treatment of pulse grains. Pulses like black gram, green gram were treated with coconut oil and kept in containers made up of plastic or tin (Fig. 4). This treatment helped the farmers in storing pulse grains for a period of 6-8 months without any pest infestation. About 50 ml of oil was enough for treating 1 kg of pulse grains. Oil treatment of pulse before storage increased the storage quality of pulses and prevented the damage caused by storage pest up to 80%. The oil treatment was more effective when the grains were exposed to sun once in five months. Oil being an easily available and cheaper material, it was preferred widely by the poor farmers. Nearly 40% pulse growers in this village had adopted this indigenous storage technology.

5 Splitting of pulses before storage

This indigenous practice of splitting pulses before storage using indigenous milling tool called, *Ural* to control storage pests like bruchid beetles and pod borers is only effective for consumption purpose (Fig. 5). Most of the storage pests in pulses like bruchid beetles and pod borers preferred whole grains than the splitted ones. Ninety per cent farmers of Ramasamyapuram village, Aruppukkottai taluk and Virudhunagar district had adopted this technology. This indigenous storage technology is popular among the poor farmers and was found to be very effective (up to 80%) in controlling storage pest.

6 Frying of pulse grains

Farmers evolved a storage technique to get rid of storage pests like pulse beetle by frying them in an iron pan (Fig. 6). The storage life of green gram and black gram for consumption purpose increased by just frying them in an iron pan for 3-4 minutes. After frying, the grains were stored in the tin or plastic containers for domestic purpose. Nearly 60% farmers in Melathulukkankulam village, Kariyapatti taluk and Virudhunagar district adopted this indigenous technology for storage of pulse grains. Frying of pulse grains before storage is believed to reduce pod borer damage considerably up to 80%. By frying, the seed coat of pulse grains became hard and the pod borer damage was considerably reduced. Farmers perceived that the storage of grains after frying reduced the storage pest attack very effectively. Though cheaper and effective for storage method, this practice is done for consumption purpose only. This practice is highly feasible for the small and marginal farmers.



Fig 1 Storage of pulses with *Naithulasi* and Chilli



Fig 2 Neem leaves for storage pests

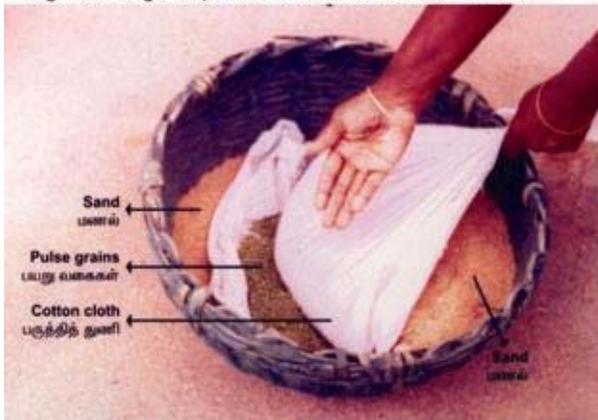


Fig 3 Storage of pulses with sand



Fig 4 Mixing of pulses with coconut oil before storage



Fig 5 Splitting of pulses before storage



Fig 6 Frying of pulse grains



Fig 7 Red earth treatment in pulses

7 Red earth treatment in pulses

Pulses seeds are coated with red earth for storage (Fig. 7). In red earth treatment, about 1 kg of red gram is mixed with 1 kg of red earth (i.e. 1:1 ratio) and then the seeds are subjected to sun drying. After one or two days of drying, the grains are stored as such for seed purpose. The smell gravel's available in the red earth make scratches on the body of the storage pests and makes them to die. Ninety per cent of the farmers of Viraliyur village, Coimbatore taluk and Coimbatore district adopted this technology for storage of pulses. The red earth treatment was found to be cheaper and effective (up to 80%) in storage pest management. This indigenous storage technology is highly popular among the farmers of low economic status.

8 Mixing of green gram grains with ash

To control the storage pest, harvested green gram is mixed with ash at 1:1 ratio. Sixty per cent farmers of Kalaiyamuthur village, Palani taluk in Dindigul district adopted this indigenous technique. After the ash treatment seed were dried and tied airtight in the jute

gunny bags. Ash treatment during storage was found to be effective for controlling the storage losses up to 80%. This practice is highly popular among the small and marginal farmers of Tamil Nadu.

Conclusion

Indigenous knowledge is the knowledge used by local people to make a living in a particular environment and is a valuable resource for development. Under certain circumstances, it can be equal to or even superior to the know-how introduced by modern research. Development efforts should therefore consider indigenous knowledge and use it to best advantage. A proper and optimal blend of indigenous and modern wisdom would be the right answer for good impact and better utilization of the native knowledge by the rural artisans.

Reference

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