

## INDIGENOUS TECHNOLOGICAL KNOWLEDGE FOLLOWED BY FARMERS OF GARHWAL HILL REGION

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Indigenous knowledge is a valuable resource for development activities. Farmers though illiterate, are by and large intelligent and have a rich treasure of farming experience. The systemic documentation of indigenous technological knowledge (ITK) or rural people knowledge (RPK) will help the scientists to understand logic behind them. Some of the ITK and practices of the farmers of Garhwal Hill Region of the Uttaranchal and their national are discussed.

### *1. Use of FYM after germination of wheat crop under rainfed condition*

As against the research recommendation of incorporating 8 tons of FYM per hectare at the time of field preparation before ploughing, farmers apply FYM after germination of wheat crop.

- FYM acts as mulch material and reduces the evaporation losses. This enables efficient use of soil moisture by wheat crop as it is a scarce resource under rainfed conditions.
- Nutrients of FYM desolved by rains in the month of November/December are directly available to growing roots.

### *2. Using five time higher seed rate of finger and barnyard millets*

As against the research recommendation of 10 kg seed rate per hectare, farmers are using 40-50 kg per hectare seed in case of finger and barnyard millet.

- a. Being rainfed and summer sown crop, there is risk of poor germination due to long spells. High seed rate compensates this risk.
- b. The excess plants are used as seedlings for transplanting in other fields and also for gap filling.

### *3. Use of 'Danala' a bullock drawn hoeing implement in rainfed finger millet*

'Danala' a long tined (six tines) bullock drawn implement is used for deep secondary tillage in standing finger millet crop when it is 8-10 cm high. Sowing of the crop is done in May and this operation is done before the onset of monsoon.

The main working force i.e. women are busy in rice fields in June and this time coincides with that of high weed and plant population of finger millet, fields. At this time the deep hoeing by 'Donala' helps uprooting and simultaneous drying of weeds and excess plant population. Men perform this operation.

### *4. Mix cropping of early sown rainfed wheat with toria*

Early maturing local variety of toria is mixed with main wheat crop sown in September. As soon as toria matures in December before snowfall, crop is harvested by uprooting the mature plants.

- c. Early sowing of wheat is done to utilize the residual soil moisture of rainy season. This enable good plant population.

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- d. Toria is taken as an additional crop without yield reduction of main wheat crop as maximum growth rate of wheat occurs after the winters i.e., after February onwards.

#### **5. Pit storage of ginger, colocasia and galgal Lime**

Pits of suitable size are dug in well-drained sandy soil near the habitation.

While putting the produce, Anyar (*Lyonia ovalifolia*) leaves are spread over the ground and kept in between the layers and also on the top of the pit before covering it. Produce is stored for about 4-5 months.

Anyar (*Lyonia ovalifolia*) leaves contain hydrocyanic acid, which avoids rotting of the produce in the storage.

#### **6. Storage of dry fodder on the tree**

In hilly areas, dry fodder of barnyard millet, rice and harvested grasses from grasslands are tied around the tree trunk starting from 8-10 feet above the ground level. This structure is locally known as 'Purelda'. The fodder is used during winter months when no fodder is available in pastures and forests.

- Fodder is not spoiled due to rooting as this method ensures proper aeration.
- Chances of rat damage are minimized.

#### **7. Extraction and use of wild apricot (chulu) oil**

Wild apricot (*prunus arminiaca*) locally known as chulu is of very less economic importance. Farmers traditionally extract its oil, which is used for various purposes.

Oil is considered to be of many medicinal uses for headache, earache, and joint pains and also for cooking purposes.

#### **8. Use of walnut leaves for storage grain pest control**

Walnut leaves are kept on the top of the storage bins. Subsequently bins are sealed.

Walnut leaves have peculiar smell, which repels the storage pests, and stored grains are saved to a great extent.

#### **9. Cow urine treatment of pulses before keeping for seed purpose**

Horse gram and lentil are highly susceptible to attack of stored grain pests. To minimize this problem, farmers used to coat the seeds with cow urine before keeping the produce in the storage bins.

Cow urine possibly has repellency to the particular pest infesting the grain.

#### **10. Use of ash to minimize the insect attack in cucurbits**

Farmers broadcast ash in cucurbits at the seedling stage as well as when top of vine are attacked by insects. Ash is considered to have insecticidal properties.

Such ITKs and practices must be identified, documented properly and its validity should be assessed scientifically. It would help to understand and facilitate the design of sustainable development of agriculture in a complex diversified and risk prone production system