

USE OF DECOMPOSED TREE LOGS IN POOR FERTILITY AND MOISTURE STRESS HILLY AREAS TO INCREASE THE YIELD OF BLACK PEPPER IN WEST GARO HILLS DISTRICT OF MEGHALAYA

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Abstract

The climate of West Garo Hills district of Meghalaya in North Eastern Region, India is the gift of god. It has the sub tropical humid climate which is suitable for horticultural crops influence throughout the year. Black pepper plantation seems to offer a better venture for earning good amount of income by tribal horticulture farmers in rural hilly area. Dryness and less nutrient content in the soil are the common problem in the horticulture orchard. Farmers are gradually adopting different indigenization technology to combat the climatic vagaries and emerging challenges in black pepper production. The study was conducted on the indigenization technology adopted by a group of Garo tribal farmers for increasing the yield of black pepper through decomposed/decay tree logs. The present paper was a single village study to trace out the farmers modification (termed as indigenization) in black pepper cultivation using decay tree log and used an index to measure extent of modification. Information was collected through a pre-tested schedule prepared for this purpose. The study reported that using of dry and decomposed tree log on the root zone area of the plant increases the fertility status and moisture retention capacity of the soil. It was also observed that it also improves the plant vegetative growth, increased the size of berries and length of fruit bearing vine and minimized the mortality rate of the plant in water stress area. The study revealed that yield of black pepper using improved variety increase upto 2.0-2.4 kg of berries/plant than indigenous variety which was recorded is 1.4-1.8 kg of berries/plant. Creating awareness and validation of this innovative indigenization technology will help many black pepper growers for large scale adoption.

Key words : *Indigenization, black pepper, decomposed tree log, yield, soil fertility, moisture stress, Garo tribe.*

Introduction

The climate of West Garo Hills district of Meghalaya is the gift of god. It has the sub tropical humid climate which is suitable for horticultural crops influence throughout the year. Indigenous knowledge linked with the manipulation and use of natural resources in various ways, forms the basis of their link with nature, and the varied levels refinement depend on the level at which the society finds itself in the social evolutionary basis (Solomon Retna Dhas Nadar Jeena et al. 2006) Rural people have been following from one generation to another generation to cope up with different situation, constraints, weather aberration, etc. (B. Lahiri et al. 2017) For that reason indigenous horticultural plants and crops are visible everywhere except in few pockets of the region. The common horticultural crops are citrus, betel nut, jackfruit, mango, drum stick, pineapple and tuber crops. In spite of abundant scope, the economy of the local settlers is very weak due to poor marketing linkage. All crop residues and farm wastes available on the farm including branches and leaves from pepper vines can be recycled, so that soil fertility is restored and maintained. It is the process of transforming organic materials of plant origin into humus (Kevin Muiyang Tawie Sulok et al., 2018) Black pepper plantation seems to offer a better venture for earning good amount of income. Department of Horticulture, West Garo Hills, Tura has contributed significantly to bringing

up of improved variety of seedlings of black pepper. At present, the scenario in price of dry seed of black pepper has gone up drawing the attention of farmers in black pepper production. *Jhumming* areas are dwindling as the frequent cycle in use affects the fertility of the soil reducing the crop production. It does not hamper to old experience farmers but the new farmers are confusing on the actual implementation method of crop cultivation.



Black pepper plantation using decay wooden logs

Farmer showing impact of indigenization technology

Methodology

The study was conducted in West Garo Hills district of Meghalaya, India. As research on indigenous knowledge requires an in-depth and anthropological approach, the present study was undertaken in the single village approach in a village called Arai mile. An interview schedule was designed to collect the primary information where secondary data were collected from village head, middleman, literature, research paper and internet.

Results and Discussion

Indigenization technology during detachment of young shoot from mother plants

During the plantation, when a plant attained at the age of 4 years & above then they generate new shoots near the base. This new shoots are move laterally direction to the ground. Once when such shoot touches the ground, the new roots are started to develop at the nodes. The new shoot keeps protruding forward until they find any support to climb upon. When the new shoot climb into the support at 6.0 metre heights then it can be detached from the mother plant by manually cutting. In another case while separating root of newly developed shoot or plant from the mother plant, it should be not be forcefully pulled out because it may causes damage to the roots. Due to longer in length, rough in handling may cause injured to the newly root and shoot. A careful approach to newly planted plant result good yield and healthy plant growth. While planting with new tree, its whole plant length and weight should be well supported in climbing position and required well prepared appropriate depth of the plant in advance. When a part of the black pepper plant while detaching from its parent body, it causes weaken to the shoot immediately. Undisturbed young roots in a new place attempts to function faster and in a favorable climate condition the new plants regain its strength just after a week or more. The natural growth was begins this onwards and within a year the plant length reaches to almost double. A young shoot is not strong enough to resist and withstand of weather fluctuation. But the shoots of a year old have good resistivity to weather fluctuation.

When a new plant reaches to its approachable height, half of the new appeared branches are needs to be reserved upside down. It helps to generate new shoots and transform into a bushy shape in

the process of the growth. One of the character reported by the black pepper grower that in improved variety of black pepper plant has a unique character when it attained at the height of 5.0 feet and above, the crop end started folded to downward within the same season and which help in fruit bearing early i.e. within one to 2 year.

Indigenization technology for moisture conservation and increase fertility status of the hilly soil enhance the yield in black pepper

Fast dryness of the soil after rainy season is a major concern. During those period plants suffers from moisture stress starting from the month of February end to April. To prevent from evaporation and conserve the soil moisture, a barrier is being place using the decay tree logs on the base of the plant. The dry or decaying tree logs are mounted and deposited in the base of plant on the ground. Dry woods after decomposed deposits humus and manure to the soil and retains soil moisture. The seed of black pepper which is harvested with this innovation has good odour and pungent. The ripen seed is bright red in colour whereas others are pale red in colour. It is also observed that seeds are bigger in size with minimum softness substance in between the seed and outer layer comparatively. This method is very low cost in maintenance and moreover less water is required for irrigation.

Used of dry and decomposed wooden log beside the side of the plant in soil increased the fertility status and moisture retention capacity of the soil. It was reported that it improve plant growth, increased the size of berries and length of fruit bearing vine and minimized the mortality rate of the plants in water stress area. The growers also reported that revealed that yield of black pepper of improved variety increased upto 2.0-2.4kg of berries/plant and in tradition variety recorded is 1.4 - 1.8 kg of berries/plant.

Constraint faced by the growers

Most of the farmers in the villages had small and marginal land holding. They reared livestock such as cows, pigs, goats and poultry for secondary income. During lean period (January to March) they leave the cattle for free grazing in the village. To avoid their damage, the long seedlings of 6.0 feet height and above are planted first because seedlings are not reachable by the cattle.

Advantage of the finding

- a) It minimized the highly mortality rate of the plants.
- b) The growth of young plants is satisfactory leading to better production.

Disadvantage of the finding

- a) It is not possible for a larger scale or commercial plantation.
- b) It cannot be transferred to long distance area but only to nearby areas.

Conclusions

Intensive programme is required for horticulture interested farmers because the soil has a big potentiality and still remains unexplored to the possible limit. This is a low cost innovative technology where locally available resources can be used. Creating awareness and validation of this innovative indigenization technology will help many black pepper growers for large scale adoption.

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