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Modernization and Management of Apple Horticulture: A Study in Western Himalayas

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Abstract: ***Mountainous region always don't promote for everything what ones need. But what we can say that economic factors favors the promotion of horticulture in the Himalayan region especially in the village of Hatkoti District Shimla Himachal Pradesh This paper examine the how the horticulture is done and varieties of apple in Shimla. To explore local knowledge of agriculture and how it's shifted to horticulture and how this horticulture changes their life towards modernization.***

Keywords: Horticulture, Modernization, Management, Varieties of apple.

1. Introduction

In Shimla at Hatkoti village. Villagers earlier before 1980's they used to practice the agriculture, shifting cultivation. Farmers used to grow the crops in their field like wheat, rice, Bajra, Maka and some mix cropping also they used to practice in the field farmers used natural fertilizer like cow dung, grass and earthworm by mixing all these three they prepare the natural fertilizer called (khaad) for their farms. But after the 1980's there was drastic change have seen in the "koti" village or whole Shimla. An American British name "Stroke" he came to Shimla he started to cultivate the apple farming in his orchard. Apple farming given many benefit to him because it production and demand of value in market and good price. People of Shimla, relatives and friends also started doing this cultivation they all took knowledge of apple farming from the stroke. And this became the trend in Shimla because of very much demand in market, good price of returns. It's cash economics which flow to the whole village because of apple orchards now every villager having a good economic status. Everyone is now happy with having apple orchards. Apple is the most important temperate fruit grown in India in terms of production and extents of area. It belongs to family Rosacea. In India Jammu & Kashmir and Himachal Pradesh are two state major apples producing states and apple based industries from the backbone of the Economy of the state. The apple cultivar "Ambry" is indigenous to Kashmir and was grown before western introductions.

2. Methodology: Area of the Study

The fieldwork was carried out in a small village called 'Sawrakoti' in Shimla district of Himachal Pradesh. The village was decided after we reached the place of our temporary residence. Thus, two categories of respondents were interviewed, namely-

- The local people of the village who may not know about Indigenous knowledge
- Elders people who having knowledge of indigenous knowledge.

Individuals from these categories constituted the ultimate units of enquiry. In addition to these a considerable number of case studies were conducted in order to attain substantial level of authenticity.

2. 1 Technique Used in Data Collection

I had prepared an interview guide, before going to the field. My focus was on areas like-the kind of indigenous knowledge villagers have, reason behind the changing the modernity, how people practice local healers, why they are leaving the trend of agriculture and practicing horticulture, about their architecture knowledge. when I started working in the village in the basis of interview guide.

I realized mostly an unstructured interview techniques to gather information. One of my informant was from village. As he's old person so usually he used to visit every time other members of the village. So I used to sit with him whenever he used to get time and within a very informal kind of conversation he gave me all the necessary data Observation was another important technique that I continually made use of this technique was very useful in gathering almost all information. Observation is the basic for all kind of anthropological observation.

2. 2 Participant-observation

This technique was also very useful to me as I did participate in their work it attached them more and helped me out to get more familiar with them washing clothe with them, helping in the kitchen like making tea for them, , helping in cutting the vegetables. so she used to say we use to do like this the name of their local leafy vegetables, she gave me by saying write it you would require it for your study purpose.

3. Results: Varieties of Apple

The Delicious group of cultivators pre-dominated the apple market. In more recent times, spur types and standard color mutant with 20-50% higher yield potential are favored. Pollen and are self-fruitful There are various variety of apples like;-

- Royal delicious. Rs. 1000/ kg value of market. It's also having variety.
  - Richard
  - Spur – American technique,
- Red spur organic,
- Red chief,

- Crimson apple,
- Red golden apple,
- Golden apple,
- Rash pep pal,
- Tera no. (13).

Spur types- Red spur, Starkrimson, golden spur, red chief and oregano spur.

3. 2 Apple varieties fall into two categories; Diploids and Triploid's.

Diploids have plenty of goods have of good pollen and are self-fruitful. Triploids are self-unfruitful varieties. Even self-fruitful varieties have to be inter planted to get commercial crops through cross-pollination. Varieties selected for inter planting should sufficiently overlap in their blossoming periods.

3. 3 Climate and soli for Apple Cultivation

Apples are generally grown from 1600 to 2300m in India. It requires chilling below 8'C for a period of two to three months to break the rest period. Temperature below -4' C is injuries. Area which are frost free, receiving good sunshine during summer months and well distributed rainfall of 100-125cm throughout the growing seasons is most suitable for apple cultivation.

Figure 1: Apple tree yet not ready.

3. 1 Propagation

Apple is propagated mainly on seedling stocks of apple Clonal rootstocks of M and MM series. MM-106 and MM-111 were identified as promising. Clonal rootstocks are raised through mound or stool layering. The mother plants are allowed to grow for one season and cut back to 3cm from the ground level just before the growth begins when new growth is about 10cm; the shoots are covered with soil leaving the growing parts exposed. Rooted layers are cut off close to the ground level and planted in nursery beds for grafting/budding. In village different types of budding/grafting are recommended, chip budding in mid-June and mid-September, whip and tongue and cleft grafting in February-march and T-budding in May-June.

3. 4 Types of Grafting

- Tea budding,
- Tongue
- D grafting.

3. 5 Chasma Technique

It's set quick technique, from these technique we can make whole a new tree of apple by taking it branch.

3. 6. Nutrient Deficiencies

The deficiencies of different elements are given below:

Nitrogen: The deficiencies of nitrogen may cause restricted growth, narrowing of top-rot ratio, less elongation of branches and reduction in size and color of fruits. The barks of the tree may be reddish or yellowish green in early stages, but later developing tints of yellow.

3. 7 Phosphorus

Shoots short, thin and upright. Leaves becomes small with dull purple bronze tints. Early defoliation of older leaves. Opening of buds in the spring is delayed. Later buds may remain dormant, therefore a few lateral shoots appear.

3. 8 Potassium

Deficiency of potassium is seen on spurs of old branches which progressed towards the younger leaves as the season advanced. The first evidence of scorch is the loss of normal green color at the widest part of leaf margin, accompanied by a water-soaked or stained appearances, which was followed by necrosis. Severely affected trees were mostly stunted in growth with small-sized leaves. The fruits in affected trees do not develop properly; remain small in size with the poor color development.

3. 9 Harvesting

Apple is harvested during July-Nov in Himachal Pradesh. Harvesting is the correct time is essential for production of quality apples. To ensure maximum storage life, apples should be harvested when mature but not yet fully ripe or overripe. If harvested before they have matured, apples will have poor eating quality and will be more susceptible to storage disorders such as scald, spot and bitter pit and may not ripen properly. Ripe fruits should be avoided because it continues to ripen in storage, rapidly becoming too soft and mealy for sale. Firmness and the level of soluble solids in the apple are good indicators of maturity to use in determining picking time. Apple are very susceptible to bruising and other forms of mechanical damage and therefore should be handled very carefully.

Apple are normally transported and stored in bulk boxes in the orchard. Each of these boxes 200 apple in per boxes. Full boxes should not be allowed to sit for extended periods in direct sunlight nor for more than a few hours before cooling is started. They also should not be overfilled

In apple, the number of days taken from full bloom to harvest are 132-134 days for starting, 138-140 days for Red Delicious and 147-148 days for Golden Delicious varieties

in the high hills. Apple cultivar Granny Smith takes 180+_ 5 days for maturity.

3. 10 Diseases

The most destructive fungal disease of apple are scab, collar rot, root rot, steam cankers and leaf spots. Among these diseases steam and branch canker cause huge losses through girdling of branches, limbs, blighting and dieback of twigs resulting in death of plants. It is very difficult to estimator the loss incurred due to canker since many factors are involved. Resulting in reduced vigor of plants which lead to lowered fruit production.

3. 10. 1. Canker disease can be defined as disease area on the steam or branch usually well-defined which often results in death of bark within the infected area.

3. 10. 2. Smoky Blight Canker: Apart for girdling of branches, the losses also occur through rotting of fruit and premature defoliation leading to reduce viability of the plant and lowering fruit production.

Figure 2: Spraying the pesticide on apple tree

3. 11. Symptoms:
The disease appear in three phase;
Leaf spot (frog eye leaf spot), Fruit rot
(Black rot), Canker (smoky blight).

- The Canker phase is most prevalent and destructive. Leaf symptoms first appear 1 to3 weeks after petal fall as small purple flecks.
- The spot area becomes irregular in shape,
- Black in color and surrounded by red halo.
- The affected fruits show early development of color and ripen 3 to 6 weeks prior to healthy fruits.
- The most serious phase of disease is the development of cankers on limbs, trunks and branches.
- Sometimes bark is killed up to wood and becomes completely cracked,
- The wood below is stained reddish brown,
- The numerous pimples like pro-tumbereance usually appear over the bark of blighted twigs or along the margin of canker.

3. 12. Management of Canker Disease:
The management of canker disease, in general is extremely difficult, as once the canker is formed on the tree steam or branches or limb, healing takes a lot of time and sometimes affected branches have to be removed. The practices mainly include cultural, chemical and biological methods of disease management.

3. 13. Cultural practice
Disease can also be kept under check by making plants less vulnerable to canker causing pathogens by avoiding mechanical injuries application of balanced fertilizer.

- Proper irrigation during hot, dry periods to avoid tree stress,
- Protecting plants from high and low temperature injuries,
- Harvesting moderate crop every year rather than taking heavy crops and ensuring effectives controls of insect's pest and disease in the orchards.
- Use of resistant varieties also provide an effective and economical controls of disease.

3. 14. Treatment of Wounds.
Pruning wounds or other unavoidable mechanical injuries should be dressed immediately with wound dress commonly called paints or paste. The cankerous portion is scarified up to woody part with sharp edged knife, cleaned with spirit and then paint is applied with a spatula. Found that paint based on the cow dung, clay soil and linseed with fungicide or Blitox-50 is useful in haling smoky blight canker.

3. 15. Paste name used in apple horticulture:

- Chopatia,
- Blight tox,
- JK paste.

Figure 3: Instrument Used During grafting

Figure 4: Paste Used for grafting in apple tree buds

3. 16. Manure used in apple horticulture are:

Organic manure

- Animal dungs like cow dungs contain nitrogen N 0. 8%
- Kheechu khad- prepared from ghass (grasses) leaves and wastage and 2kg keechu which is affiliated from the govt.

- Sheep, goat dung contain nitrogen 50%

Also govt. provide subsidy, medicine, fertilizer.
Prevention:

- Quantity of medicine spray,
- Necessity of medicine what required for tree,
- Tie clothes as mask on the face and wear spects,
- Shoot borer.

4. Conclusion

The findings of my study show that ecological and economic factors both have the positive implication for the apple horticulture. It's also have seen that earlier people were not so good in financial condition but as they started to grow apple cultivation they become well in their financial now a days everyone having their own apple cultivation field. They grow the apple and hire some of the laborswho come from the Bihar and Nepal Regions they pack and make the boxes of an apple as per as the boxes are fix for per Kg and its rates are decided by the market and send it to main market and then apple goes to the northern India and rates of an apple become costly. Govt. wants to ensure enough supply of packing without touching the trees in the state's forest. It's also noticed that because of the apple cultivation people are managing trust temple of the village they organized the fair in every navratars in and mela.

The agriculture practice of indigenous people have perfected over time. The farmers have been using this knowledge system for making their agricultural production more satisfying and yielding. The locals produce from the field are used for their consumption and excess of which is sold to the market.

Agriculture practice in its simplest form requires cow dung with two animals, cultivate at subsistence level, agricultural implements are indigenous (locally produced), use cow dung as manure and corporate rendering help in rendering help in the field among relatives or villagers on a reciprocal basis. Oral history shows that these people have been practicing agriculture right from the tine of forefathers migrated and settled in this village. Agriculture has been their mainstay. In the present day context, agriculture practice has reduced down to very small scale comparatively to earlier, many of indigenous technologies in agriculture has been replaced by modern technologies. And whole village is involve in horticulture of apple because it is giving more cash, more profit, improved their standard of living and it is replaced by so called modern technology. The inclination of younger generation to the modern commercialized economic sector is very much noticeable. These indigenous practice are somewhat endangered ones and they are available with the elderly farmers as an unwritten body of knowledge. Also, because of these factors, altogether the slow transitional process is occurring in traditional modes of production to modern modes of production.

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