

FACE POSITIONS YIELD DIFFERENT QUANTITIES OF RESIN FROM *PINUS ROXBURGHII*

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Summary

Using 40% H_2SO_4 in conjunction with American bark hack method with an 18 cm wide streak and 1.90 cm cutting edge and working single and both the faces of chir pine tree it has been indicated over a period of 4 years continuous tapping that yield from single face of one tree (East and West) is significantly more when the tree is worked simultaneously on two faces (East plus West). It has also been found that western faces of the trees yield more gum as compared to eastern faces.

Introduction

In Pakistan the conventional method of resin tapping has been in vogue for almost over a century. It was possible to bring about an improvement in yield of resin by introducing the American method of resin tapping which is known as the American bark hack, and different concentrations of sulphuric acid solution and paste to keep the resin ducts open. Studies in this regard were started in Pakistan in 1974 which gave very encouraging results. It was found that if the blaze width was kept equal to the diameter of the tree and 40% sulphuric acid solution was used to stimulate the flow of resin, average yield of 5.5 kg per tree could be obtained as to about 2.1 per tree obtained from the trees worked under the conventional method of tapping. Later on the width of the blaze was reduced to only 15 cm and it was still possible to get about 3.5 kg per tree as compared to 1.5 kg from the control trees.

During these studies an other interest was developed. It was considered worthwhile to find out the effect of simultaneous working on two faces of the same tree. The study was considered feasible and practical since the method was an integral phase of the commercial resin production in USA. It was expected that the study would provide data for developing intensive extraction techniques, as it is a pre-conceived method to increase production per tree in a relatively short time to coincide with the silvicultural requirements of the timber stands.

The chir tree becomes tapable between the ages of 55 to 60 years when the average is 30 cm. It is being disused in many forestry quarters to bring down the rotation of chir pine to about 60–80 in view of its new found end uses and also for long fibre pulp. In that case, it would be an ideal situation to double face the older trees and get the maximum resin out of them before these are harvested.

It was considered that in case of a switch over the results achieved by this study would be handy to embark upon a plan of operations involving large scale intensive tapping. It was thus planned to evolve a new system of tapping which would be based on the American system but

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would take cognizance of the fact that trees in Pakistan have to be tapped for a longer period as compared to the practice in USA where rotations are much shorter. Thus the main objectives of the replacement project was to find out if there was a significant difference in the yields by face positions when 40% H_2SO_4 treatment was given at 14-day interval with a face width of 18 cm.

Experimental Procedure

Selection of Site

The experiment was proposed to be laid out in N.W.F.P. For this purpose, a number of chir pine forests were visited in February and March, 1979 taking into consideration the following criteria:

- Diameter range of 28 - 32 cms
- Easy accessibility and approach
- Untapped trees
- Good crown form
- Preferably the same altitudinal level and the same aspect

Batrasi compartment 4(iii) met most of the requirements and was considered adequately suited to lay out the study.

Lay Out and Design

Keeping in view the main objectives of the study i.e. would there be significant difference in yields of gum by face positions, 225 trees were selected in early April, 1979. Five blocks of 45 trees each were marked allotting 15 trees to each of the 3 treatments. The trees selected were between 28–32 cms diameter, of good form with fairly well developed crowns and free from diseases and suppression.

	Treatments	Total number of	
		trees	faces
Double face 15 trees/plot (5 Blocks)		75	150
Single face 15 trees/plot east blocks		75	75
Single face 15 trees/plot west blocks		75	75
Trees/block 45	Total	225	300

Design of the Experiment

R 1	West	Double face	East
R 2	East	Double face	West
R 3	West	East	Double face
R 4	East	West	Double face
R 5	West	Double face	East

Each plot consisted of 15 trees of almost equal basal area per plot.

The trees were marked to show the

- (i) number of block
- (ii) treatment
- (iii) number of trees in the plot

The numbers were painted on small rectangular plates which were later fixed on the trees. Diameter and height of the trees were recorded. Surround of the experiment was marked with red rings around the trees.

Setting up of the Crop

Bark of the trees was scraped 60 cm above the ground level, about 20 - 25 cm wide strip leaving only 6 mm thick bark. Apron and gutters were fixed on the trees 15 cm above the ground level. Wood was exposed in 18 cm wide strip with the help of American bark hack of 1.90 cm cutting edge, just above the apron and gutter. 40% H_2SO_4 solution was applied in one steady motion along the streak squeezing the bottle simultaneously, wetting the streak thoroughly from end to end. The acid was applied in the form of spray not as a stream, hitting the streak at the top junction of bark and wood. About 3 cm below the apron and gutter a nail was driven and a tin pot of 15 x 10 cm size fixed for resin collection. Standard 14-day chipping interval was adopted. This would give 16 streaks in a season.

The debris including the wood chips, bark and pine needles was cleared in a radius of 2 meters from the tree as a safeguard against fire. All these operations were done during the third week of April and the experiment was started on 20th April, 1979. No operation other than freshening of the blazes and weighing of the resin (both fortnightly) from individual trees were done.

Seasonal schedule of freshening the blazes and weighing of the resin was prepared and followed.

Collection of Data and Analysis

Yield was determined separately for each of the treatments. Resin collected from each face was weighed and recorded according to the set schedule.

Summary of average resin yield per tree (kg) (1979-82)

	E	W	Total E & W	Ed	Wd	Total Ed & Wd
1979	1.71	2.06	3.77	1.56	1.88	3.44
1980	2.25	2.67	4.92	2.03	2.46	4.49
1981	2.30	2.75	5.05	1.98	2.35	4.33
1982	2.30	10.20	5.02	1.94	2.35	4.29
Total	8.56	10.20	18.76	7.51	9.04	16.55
Average	2.14	2.55	4.69	1.88	2.26	4.14

E = East

W = West

Ed = East face (double)

Wd = West face (double)

Conclusions

1. The yield from the single cupped trees (E 2.14 kg + W 2.55 kg = 4.69 kg) is highly significant as compared to the yield from double cupped trees (Ed 1.88 + Wd 2.26 kg = 4.14 kg). The average difference between the two being about 0.55 kg.
2. Yield from the western faces (W 2.55 kg + Wd 2.26 kg = 4.81 kg) is highly significant as compared to the yield from eastern faces (E 2.14 kg + Ed 1.88 kg = 4.02 kg) both in single as well as double cupped trees.
3. Yield from blaze on eastern (2.14 kg) or western face (2.55 kg) of a single cupped trees is significant as compared to yield from eastern (1.88 kg) or western face (2.26 kg) of a double cupped trees.
4. Average yield from single cupped trees (E and W = 2.34 kg) is significantly higher as compared to the average of total yield from double cupped trees (Ed and Wd + 2.07 kg).

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