

**DETERMINATION OF PRUNING TIMES OF ZIZIPHUS XYLOPYRA (WILLD.)  
IN UTTAR PRADESH**

By

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Uttar Pradesh has never been important for producing lac, though it can boast of originating the shellac industry in its town of Mirzapur. Nevertheless, the production of lac in the state has registered a steady increase with 238.5 Metric tonnes (0.67% of total production of India) in the pre-war period 1930-31 to 1939-40, 586.0 Metric tonnes (1.38% of total production of India) in the post-war period 1946-47 to 1958-59 and 2001.9 Metric tonnes (6.6% of the total production of India) during 1965-66 to 1967-70.

A total of 13 host-species, including the lac tree or *kusum* (*Schleichera oleosa* (Lour.) Oken) Sapindaceae, *ghont* (*Ziziphus xylopyra* Willd.) (Rhamnaceae), Flame of the Forest or *palas* (*Butea monosperma* (Lam.) Taub) (Leguminosae : Papilionaceae), Jujube or *ber* (*Ziziphus mauritiana* Lam.) (Rhamnaceae) and *Ficus* spp. (Moraceae) have been recorded from this State by various writers (Watt, 1901; Stebbing, 1910; Imms and Chatterjee, 1915; Lindsay and Harlow, 1921; Misra, 1928; Glover, 1937); but nearly all the contribution of lac by the State is *Rangeeni* lac from the last three hosts. The principal areas of lac production in the State are districts of Dehra Dun, Saharanpur, Moradabad, Rampur, Bareilly, Pilibhit, Sahajahanpur, Kheri, Sitapur, Bahraich, Gonda, Barabanki, Lucknow, Banda, Hamirpur, Jalaun, Jhansi, Varanasi and Mirzapur. The last named district contributes the maximum, i.e. 690 Metric tonnes annually.

*Ghont* has an extensive distribution in India and besides being claimed as a major host for commercial production of lac in Uttar Pradesh, Madhya Pradesh and Punjab (Stebbing, 1910; Lindsay and Harlow, 1921; Misra, 1928; Glover, 1937 and Roonwal *et al.*, 1958) is otherwise too an economically important species (Gokulpure and Mehra, 1966; Sah and Mehra, 1966; Gokulpure, Maurya and Mehra, 1970).

Pruning is one of the important operations in lac culture, and has already been studied on *ghont* at Damoh (Madhya Pradesh) (Gokulpure *et al.* 1965) and at Namkum (District Ranchi, Bihar) (Naqvi *et al.* 1970).

The present article describes the results obtained from pruning studies carried out on *ghont* in the environs of Mirzapur at Kotwa Forest Range, during 1959-60 to 1969-70. The site of the experimental area was selected in Mirzapur Forest Division adjacent to Kotwa Plantation of the Forest Department nearly 24 km from Mirzapur on Mirzapur-Robertsganj Road. It was a pure patch of *ghont* mixed with a few *khair* (*Acacia catechu* Willd.), *A. tortareib* and *Lagerstromia parviflora* Roxb. trees on a level bed with a poor sandy soil mixed with rocks.

**Experimental details**

*Treatments* :—Pruning in second week of February for *Katki* crop (June-July to October-November) and in the second week of April for *Baisakhi* crop (October-November to June-July) Negi, 1948) were taken as basis for comparison with the pruning times under trial, as follows :

*Katki* crop :—Host inoculated with crawling stage of the lac insect in June-July, complete the life cycle in October-November.

*Treatment A* :—Pruning in October-November at the time of harvesting allowing 8-9 months for the growth of shoots before inoculation.

*Treatment B* :—Pruning in the second week of February, allowing 4-5 months for the growth of shoots before inoculation.

*Treatment C/D* :—Pruning in the third week of May allowing 13-14 months time for the growth of shoots before inoculation in June-July next year.

Two blocks of trees were provided under this treatment for use in alternate years, since one block will remain under crop when it will be time to prune the other one.

*Baisakhi crop* :—Host inoculated with crawling stage of the lac insect in October-November, complete the life cycle in June-July next year.

*Treatment A* :—Pruning in the second week of April, allowing 6-7 months time for growth of shoots before inoculation.

*Treatment B* :—Pruning in the third week of May, allowing 5-6 months time for growth of shoots before inoculation.

*Lay out* :—The experiment was laid out in three coupes, one for *katki* crop for use every year and two for *Baisakhi* crop, for use in alternate years.

Each treatment was tried on 5 trees and 10 replications on randomised block design. Thus the *Katki* coupe contained  $4 \times 5 \times 10 = 200$  trees, and each of the two *Baisakhi* coupe  $2 \times 5 \times 10 = 100$  trees.

*Observations* :—(a) Measurement of shoots—Linear measurement of shoots was recorded at fortnightly interval from 6 randomly selected trees out of all the 10 replications.

Due to dense growth of thorny shoots and difficulty in measuring them, only the primary and secondary shoots were measured.

## Results

### *Katki* season

(i) *Response of trees to pruning* :—Lesser time i.e. 2 weeks was taken by the primary buds to appear after pruning on trees pruned in May of the previous year (*Treatment C/D*) than in other treatments.

The average number and length of primary and secondary shoots were highest on trees pruned in May (*Treatment C/D*) at the time of inoculation (Figures 1 & 2). Thus maximum surface for settlement of the young lac insect was offered by trees pruned in May (*Treatment C/D*).

The active period of growth in trees pruned in October-November (*Treatment A*) and February (*Treatment B*) was found between March and July. Pruning in May (*Treatment C/D*), however, presents a clear picture of the growth in *ghont* throughout the year, since the period between pruning and inoculation extends over 13 months. The active periods of growth in this treatment were observed from the time of pruning (May) to September and again from March to July next year, with the dormant period in between which covers the winter months (Fig. 1 & 2). Maximum growth was found during June to September. Most of shoots under 75 cm in length dried during summer (April to June). The circumference of the shoots at the base in the three treatments A, B and C/D were observed to be 12.5, 12.5 and 22.5 cm respectively. However, circumference measuring 3-9 cm was found most suitable for survival of insects and production of continuous encrustation.

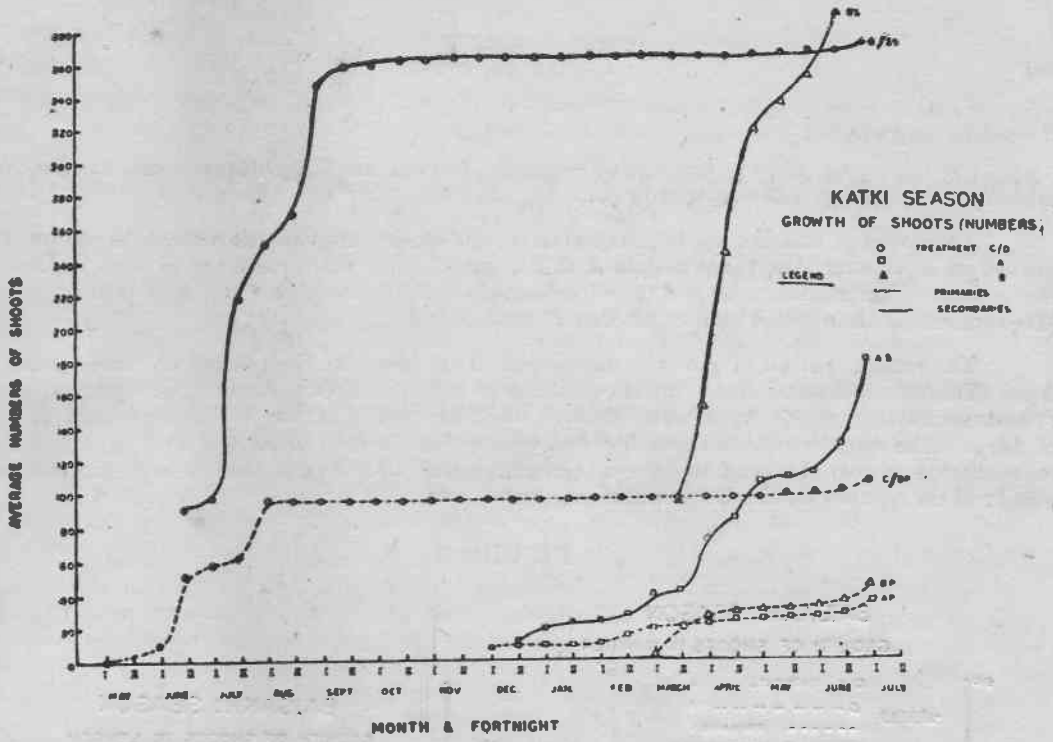
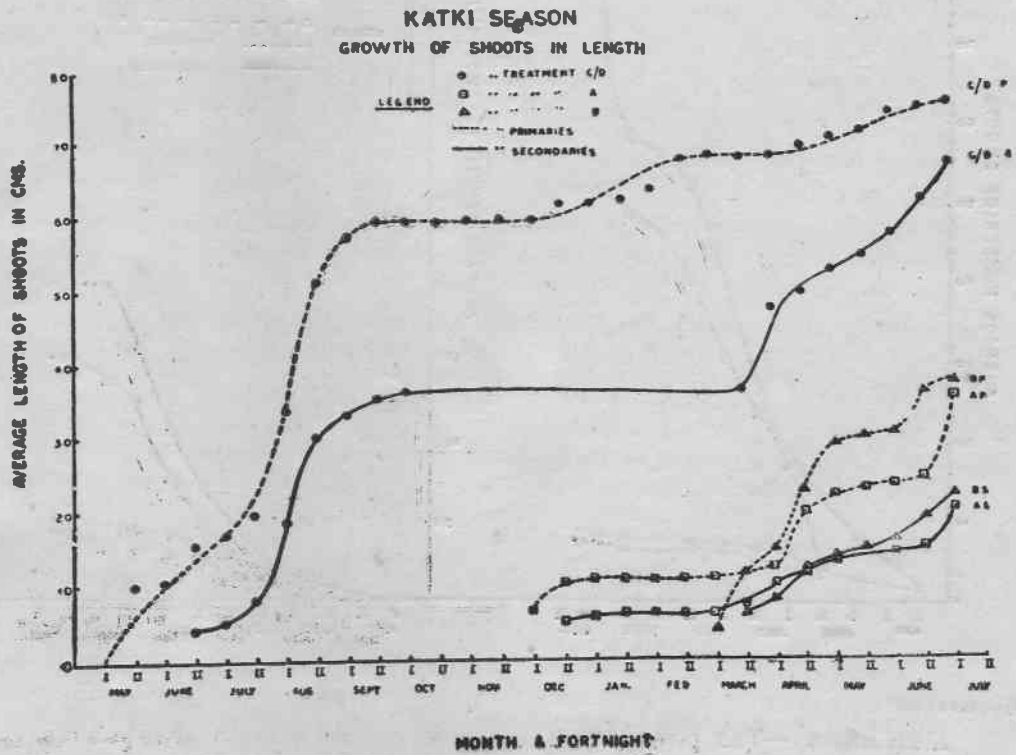


FIGURE 2



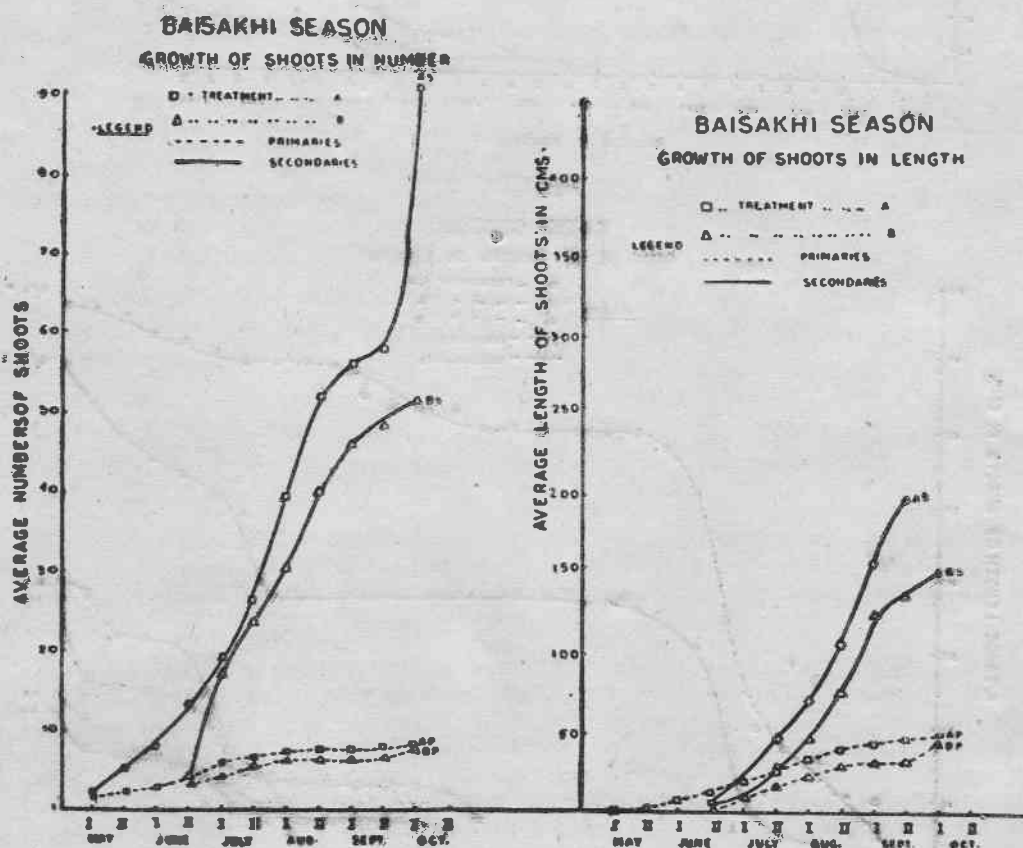
**Baisakhi season**

(i) *Response of trees to pruning* :—Trees pruned in May (Treatment B) put forth primary buds earlier, 1.2 weeks after pruning, than the other two treatments.

The average number of primary shoots and their length was almost equal on trees pruned in April and May (Treatments A & B), and higher than one trees pruned in October-November. The number and length of secondary shoots was higher on trees pruned in April (Treatment A) than those pruned in May (Treatment B).

The active period of growth was found from May to September on trees pruned in April (Treatment A) and from middle of June to middle of October on trees pruned in May (Treatment B) (Fig. 3). Maximum growth was observed in latter half of June and first half of July. The most suitable shoot for the young lac insects to thrive and later produce a encrustation, were observed to have a circumference of 3-5 cm and heavy mortality was observed on thinner or thicker circumferences.

FIGURE 3



**Discussion**

*Katki season* :—The primary buds appeared earliest, 2 weeks after pruning, on trees pruned in May of the previous year, and latest, 5 weeks after pruning, on trees

pruned in December at Mirzapur. While similar results were obtained at Damoh (Gokulpure *et al.*, 1965), the time taken for buds to appear was 5 weeks and 7.2 weeks respectively. Different results were, however, obtained at Namkum (Naqvi *et al.*, 1970), where buds appeared 3 weeks after pruning on trees pruned in December and 4 weeks after on trees pruned in May of the previous year.

Highest number of primary shoots at the time of inoculation in July was available on trees pruned in February at Mirzapur and Damoh and on May—pruned trees at Namkum. Highest number of secondary shoots were available on trees pruned in May of the previous year at Mirzapur and Namkum, and nearly equal number on all the three treatments at Damoh. However, longest shoots were obtained on trees pruned in May of the previous year, at all the three stations. Trees pruned in May also offered the biggest surface for settlement of crawlers of the lac insect.

*Baisakhi* season :—The primary buds appeared earliest, 1.2 weeks after pruning, on trees pruned in April and later, 1.5 weeks after pruning on May pruned trees at Mirzapur. Contrary results were, however, obtained at Damoh (Gokulpure *et al.* 1965), where the time taken for the buds to appear was 3.8 weeks after pruning in May and 5 weeks after pruning in April. At Namkum (Naqvi *et al.* 1970) the buds appeared 2.7 weeks after pruning in May and 4 weeks after pruning in April.

Higher number of primary shoots were thrown on trees pruned in April at Mirzapur and Damoh but on trees pruned in May at Namkum. Higher number of secondary shoots were put forth by trees pruned in May at Mirzapur and Namkum and on April-pruned trees at Damoh. Longer primary and secondary shoots were however, obtained on April-pruned trees at all the three stations. More surface for settlement of crawlers of the lac insect was offered by May—pruned trees at Mirzapur, while by April-pruned trees at Damoh and Namkum.

### Conclusions

*Ghont* trees in Uttar Pradesh may be provided with (i) 13-14 months old shoots for *Katki* crop inoculation in June-July by pruning the trees in the May of the previous year and (ii) 6-7 months old shoots for *Baisakhi* crop inoculation in October-November by pruning the trees in first half of April the same year.

These pruning schedules will afford more suitable surface for settlement of crawlers by producing shoots of 3-9 cm circumference. Pruning in May for *Katki* crop inoculation allows the trees to pass through two growing periods which enables the shoots to grow in thickness towards the proximal portion to the extent that they need not be cut at the point of attachment. Hence at the time of harvesting or pruning only the distal thinner portion need be removed and the thicker basal stump be left to enable better and bigger crown formation after each harvesting or pruning operation. In the other treatments on the contrary, majority of shoots have to be removed at the point of attachment at each harvesting or pruning operations, which prevents formation of a good crown.

It may also be concluded that recommendation of Negi (1948) of pruning the *Rangeni* lac hosts in the first half of February for *Katki* crop inoculation in July of the same year, does not hold good for *ghont* either at Mirzapur (Uttar Pradesh), Damoh (Madhya Pradesh) or Namkum (Bihar) and that his recommendation (1948) of pruning the hosts in the first half of April for *Baisakhi* crop inoculation in October-November of the same year does hold good at these three stations.

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### SUMMARY

Suitable age of shoots, at the time of introduction of the lac insect on them, is necessary for the latter's successful colonization and the ultimate increased yield of lac.

Systematic trails of the culture on *ghont* (*Ziziphus xylopyra* Willd.) in Uttar Pradesh were carried out for the first time.

Results indicate that (i) for raising *Katki* crop (June-July to October-November cycle), the trees should be pruned in May for introducing lac insects on them in June-July of the following year i.e. on 13-14 months old shoots. (ii) for raising *Baisakhi* crop (October-November to June-July cycle), the trees should be pruned in April for introducing lac insects on them in October-November the same year i.e. on 6-7 months old shoots.

उत्तर प्रदेश में जिजीफस जायलोपायरा विल्ड० के अधिकृन्तन समयों का विनिश्चयन  
लेखक बी० पी० मेहरा, आर० सी० मिश्र, पी० सेन, आर० एस० गोकुलपुरे व आर० सी० मौर्य

### सारांश

लाख को सफलतापूर्वक लगाने और अन्ततः उसकी प्राप्ति बढ़ाने के लिए प्ररोहों पर लाख-कीट छोड़ते समय प्ररोहों की उम्र उपयुक्त होना आवश्यक है।

घोंट (जिजीफस जायलोपायरा विल्ड०) पर लाख संवर्धन कराने के विधिवत् परीक्षण उत्तर प्रदेश में पहली बार किए गए हैं।

परिणामों से संकेत मिलता है कि (१) कातकी (जून-जुलाई से अक्टूबर-नवम्बर चक्र) लाख (फसल) के लिए वृक्षों की डाल कटाई मई में करनी चाहिए ताकि अगले वर्ष जून-जुलाई में अर्थात् १३-१४ मास के प्ररोहों पर लाख के कीड़े छोड़े जा सकें, (२) बैसाखी (अक्टूबर-नवम्बर से जून-जुलाई चक्र) लाख (फसल) के लिए वृक्षों की डाल कटाई अप्रैल में करनी चाहिए ताकि उनपर लाख-कीट उसी वर्ष अक्टूबर-नवम्बर में अर्थात् ६-७ महीने के प्ररोहों पर छोड़े जा सकें।

Bestimmung der Aufästungszeiten der *Ziziphus xylopyra* Willd im Uttarpradesh

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### ZUSAMMENFASSUNG

Das passende Alter der Schösslingen an Einleitung der Lackinsekte zu dennen ist nötig zu ihre erfolgreiche Besiedlung und allerletzten vergrösserten Ertragen der Lack.

Zuerstenmals, hat Man die systematische Proben auf Lackbildung an Ghont (*Ziziphus xylopyra*) im Uttarpradesh geertragt.

Die Angaben, zeigen daß (i) für Katkiernt (Juni-Juli zu October Novémbler Kreise), zu Einleitung die Lackinsekten an dennen im folgende Jahr d.i. an 13-14 monate Schösslingen die Bäume im Mai aufgeschnitted sollen (ii) für Baisakhiernt (Október-Novémbler zu Juni-Juli Kreise), zu Einleitung die Lackinsekte an dennen im Octóber-Novémbler, selfjahr, d.i. an 6-7 monate Schösslingen, die Bäume im April, aufgeschnitted sollen.

Détermination de la saison de l'élagage des arbres de *Ziziphus xylopyra* (Willd.)  
dans l'Uttar Pradesh

par B.P. MEHRA, R.C. MISHRA, P. SEN, R.S. GOKULPURE ET R.C. MAURYA

Résumé

Il faut que pour coloniser avec succès des insectes à laque et assurer une augmentation définitive du rendement en laque, les rameaux aient un âge approprié au moment où l'on y plante des insectes. C'était pour la première fois qu'on avait entrepris des essais systématiques de la culture de laque dans l'Uttar Pradesh.

Il ressort des résultats obtenus que :

- pour la culture "Katki" (Cycle de juin-juillet à octobre-novembre) les arbres devrait être ébranché au mois de mai et des insectes à laque y planté aux mois de juin-juillet de l'année suivante, c'est-à-dire sur des rameaux âgés de 13 à 14 mois.
- pour la culture "Baisakhi" (Cycle d'octobre-novembre à juin-juillet) l'ébranchage des arbres devrait être effectué en avril pour y planter des insectes aux mois d'octobre-novembre de la même année, c'est-à-dire sur des rameaux âgés de 6 ou 7 mois.

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