SYSTEMATIC TRIALS OF LAC CULTIVATION ON *GHONT* (*ZIZIPHUS XYLOPYRUS* WILLD.) IN MADHYA PRADESH — REQUIREMENT OF BROODLAC FOR CROP INOCULATION

By

B.P. Mehra, R.S. Gokulpure and B.N. Sah

Division of Entomology, Indian Lac Research Institute, Namkum, Ranchi

SUMMARY

Quantities of broodlac to be used on *ghont* for crop inoculation of *Baisakhi* and *Katki* have been determined. About 270 gm broodlac may be used for *Baisakhi* crop inoculation and 530 gm per tree for *Katki* crop inoculation. Heavy inoculation yields a poor *Baisakhi* crop but satisfactory *Katki* crop.

Introduction

After establishing the proper time for pruning of *ghont* (*Ziziphus xylopyrus* Willd.) (Gokulpure *et al.*, 1965) it was necessary to determine the optimum quantity of broodlac required for crop inoculation for a successful crop. It is an important aspect of lac cultivation since it has been observed that *Baisakhi* crop, which passes through summer, requires a sparse settlement of larvae, i.e., light inoculation, for a successful crop. while *Katki* crop could take close settlement, i.e., heavy inoculation, without adversely affecting the crop. The high mortality in a heavy larval settlement during summer and the resulting poor *Baisakhi* crop may be due to deficient moisture contents of the soil resulting in the concentration of the sap of the tree and its poor flow through the branches, which are then unable to sustain a large number of larvae. Hence, it was considered necessary to determine the quantities of broodlac for successful *Baisakhi* and *Katki* crops.

Experimental details

The experiment was laid out on the randomised block design and conducted on naturally occurring *ghont* trees in Damoh on three-coupe system-two for *Baisakhi* crop to be utilised in alternate years with pruning in April and one for *Katki* crop to be utilised every year with pruning in February.

Half-normal, normal and double normal brood rates were tried during *Baisakhi* 1959-60, *Katki* 1960 and *Baisakhi* 1960-61 crops; normal brood rate having been arbitrarily fixed at 250 gm per tree. However, this quantity proved to be either too little or too much for some trees, since they were not the same size initially and increased in size with regular pruning. Here at time of inoculation, the normal brood requirement of individual trees was assessed by visual estimation (at the rate of 1 metre of broodlac for 25 metres of inoculable shoots of the tree) and inoculation carried out according to the half-normal, normal or double normal brood rates under which the trees fell. However, the total broodlac used on 50 trees under each of the three treatments gave ratio of 0.54:1:1.73 and not 0.5:1:2, as desired. Hence from *Katki* 1961 onwards a different method of assessing the broodlac requirement was followed for *Katki* 1961, *Baisakhi* 1961-62, *Katki* 1962, *Baisakhi* 1962-63, *Katki* 1963 and *Baisakhi* 1963-64. According to this method, the normal requirement of a tree was determined by estimating total normal requirement of 15 trees in a block (i.e., 5 trees each of the three treatments) and finding out the average for them. Taking this as basis the total requirement for 5 trees each under the three treatments was calculated and that quantity was distributed according to the individual requirement of each of the five trees under that treatment. No inoculation was carried out *Katki* 1964 crop due to want of broodlac. By this method of calculating broodlac requirement, it was possible to maintain the desired ratio of 0.5:1:2 between the three treatments.

Following this method of determining the broodlac requirement for each treatment, half-normal brood rate was droped and triple-normal brood rate added, i.e., normal, double normal and triple normal brood rates were tried for *Baisakhi* 1964-65, *Katki* 1965, *Baisakhi* 1965-66, *Katki* 1966 and *Baisakhi* 1966-67 crops. No crop was obtained from *Katki* 1966.

Discussion of results

Due to the varying size of the trees at the outset and later as a result of regular and systematic pruning, the brood rates under trial varied from crop to crop. Since the aim of the experiment was to determine the optimum broodlac requirement for crop inoculations, the tried brood rates together with their results have been arranged in ascending order for both the crops separately, irrespective of the treatments and the years in which these were tried.

From the results of *Baisakhi* crops (Table I) it will be observed that brood rates ranging from 212 gm per tree (10.6 kg per 50 trees) to 360 gm per tree (18.3 kg per 50 trees), i.e., an average of 266 gm per tree (13.32 gm per 50 trees) gave encouraging results and the highest average ratio of scraped lacs was obtained from broodlac used and the yield obtained, viz., 1:1.03 (Variation 1.0–1.88). The maximum ratio of scraped lac from broodlac used and the yield obtained, viz., 1:1.88 was obtained by using 320 gm broodlac per tree (16 kg per 50 trees) and the maximum ratio of broodlac used and broodlac obtained, viz., 1:1.21, was obtained by using 248 gm broodlac per tree (12.4 kg per 50 trees) and both these brood rates come within the selected range of brood rates.

Table I

Quantity of broodlac used and yield ratio

Baisakhi crops

Broodlac Used		Ratios of broodlac used to yield	
Per tree kg	Per 50 trees kg	Broodlac:Broodlac	Broodlac:Total yield (Scraped lac)
0.132	6.6	1:0.12	1:0.7
0.160	8.0	1:0.85	1:0.64
0.180	9.0	1;0	1:0.13
0.200	10.0	1:0.05	1:0.01
0.212	10.6	1:0.73	1:1
0.214	10.7	1:0.03	1:1.63
0.238	11.9	1:0	1:1.17
0.248	12.4	1.1.21	1:1.24
0.320	16.0	1:0.66	1:1.88
0.360	18.3	1:0.01	1:1.63
0.386	19.3	1:0	1.0.16
0.400	20.0	1:0.06	1:0.01
0.424	21.2	1:0.43	1:1
0.496	24.8	1:1.1	1:1.25
0.600	30.0	1:0.05	1:0.01
0.640	32.0	1:0.23	1:1
0.812	40.6	1:0	1:0.2
0.848	42.4	1:0.01	1:0.48
0.992	49.6	1:0.55	1:0.79
1.200	60.0	1:0	1:0.33
1.624	81.2	1:0	1:0.18
1.800	90.0	1:0	1:0.21
2.436	121.8	1:0	1:0.03

From the results of *Katki* crops (Table II) it, will be observed that 528 gm per tree 26.4 kg per 50 trees) gave the highest ratio of scraped lacs from the broodlac used and the yield obtained, viz., 1:1.92 and also the highest ratio of broodlac used to broodlac obtained, viz., 1:1.05.

Table II
Quantity of broodlac used and yield ratios
Katki crops

Broodlac used		Ratios of broodlac used to yield	
Per tree kg	Per 50 trees kg	Broodlac: Broodlac	Broodlac: Total yield (Scraped lac)
0.110	5.5	1:0.27	1:0.05
0.138	6.9	1:0.52	1:0.34
0.140	7.0	1:0.16	1:0.03
0.208	10.4	1:0.51	1:0.01
0.220	11.0	1:0.10	1:0.04
0.260	13.0	1:0.50	1:0.15
0.276	13.8	1:0 49	1:0.51
0.416	20.8	1:0.54	1:0.08
0.440	22.0	1:0.13	1:0.03
0.450	22.5	1:0.79	1:0.48
0.528	26.4	1:1.05	1:1.92
0.552	27 6	1:0.42	1:0.56
0.832	41.6	1:0.42	1:0.48
1.056	52.8	1:0.74	1:0.73
1.584	79.2	1:0.57	1:0.57

Conclusion

An average of 270 gm broodlac per tree or 13.5 kg per 50 trees is recommended for *Baisakhi* crop inoculation and 530 gm per tree or 26.5 kg per 50 trees (i.e., approximately double the quantity used for *Baisakhi* crop) for *Katki* crop inoculation.

Light inoculation yields a successful *Baisakhi* crop and heavy inoculation (almost double the quantity used for inoculating *Baisakhi* crop) a successful *Katki* crop.

Reference

1. Gokulpure, R.S.; Mehra, B.P.; Krishnaswami, S.; Teotia, T.P.S. and Sah, B.N. (1965)— Systematic trials of lac cultivation on *ghont* (*Zizyphus xylopyra* Willd.) in Madhya Pradesh-Pruning. *Indian Forester*, 91(6): 406-417.