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SETTLEMENT PATTERN OF *RANGEENI* FORM OF LAC INSECT *KERRIA LACCA* AS INFLUENCED BY LOCATION OF BROODLAC PLACEMENT

by

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Introduction

The Indian lac insect, *Kerria lacca* (Kerr) is the commonly used insect for production of lac in India. They are sedentary, phytosuccivorous, thrive on tender twigs and feed on phloem sap of specific host plants namely *kusum* (*Schleichera oleosa*), *palas* (*Butea monosperma*), *ber* (*Zizyphus mauritiana*), *Flemingia semialata*, *Ficus* spp and many others. Though the lac insect culture thrives on shoots of several host trees and more than 400 plant species have been reported worldwide to be the hosts of lac insect (Roonwal *et al.*,1958 ; Sharma *et al.*, 1997). *Rangeeni* and *kusmi* are the two strains of lac insect which are classified on the basis of preference of host specificity. Broodlac can be defined as mature mother cells of lac insect on host twigs, from which larval emergence takes place. Broodlac is equivalent to seed of other agricultural crops, consisting of gravid female lac insects, utilized for raising new lac crop. The first operation in lac cultivation is to carry out inoculation of the hosts in the correct manner. Variations shown in this respect quite often leads to crop failure because of poor initial larval settlement. Inoculation of broodlac is one of the most important operations in lac cultivation which is labour intensive.

Settlement of lac insect on host trees varies to a great extent depending upon several factors e.g. nature of host, quality of broodlac, rate of broodlac and mode of inoculation with respect to their placement. Usually lac insect tends to settle on the nearby suitable branches and sparse settlement is observed in distantly located branches. Glover (1931) has recommended placing broodlac as near as possible to the targeted branches on the host trees to facilitate better and quick settlement of lac insect. However, quantified data on lac insect settlement as influenced by placement of broodlac at different distances is not available. Keeping this in mind and also to reduce the labour cost of broodlac inoculation, a study was undertaken to assess the variation in settlement pattern of lac insect by inoculating the broodlac on single site and multiple site. If proper settlement of lac insect is facilitated by placing broodlac on a single point, then we can reduce labour and time of broodlac inoculation to a great extent.

The following study was initiated to evaluate whether two methods of broodlac placement affect the efficiency of lac insect settlement and to work out settlement of lac insect on host tree branches as affected by different systems of inoculation

Material and Methods

To study the settlement pattern, broodlac *rangeeni* form of *K. lacca* was inoculated in July, 2008 @ 15 g per meter shoot length for raising summer season (*baisakhi*) lac crop on *Butea monosperma* (*palas)* trees. The inoculation was done on medium sized *palas* trees pruned seven months prior to inoculation by placing broodlac on single and multiple sites of host plants.

Ten trees in case of single site inoculation and twelve trees in case of multiple site inoculation marked separately were taken for the study. In case of single site inoculation, all the brood bundles required for adequate settlement for the tree were placed and tied in a single point

Table 1: Response of lac insect settlement with respect to single and multiple point inoculation

Tree No.	Coverage per 100 g broodlac (cm)		Unsettled branches (%)		Brood used (g)	
	Single point	Multiple point	Single point	Multiple point	Single point	Multiple point
1	257.7	368.5	44.9	0	650	680
2	328.2	347.1	30.0	0	110	450
3	158.4	271.7	42.1	0	250	680
4	186.8	203.3	50.0	11.4	380	450
5	299.3	348.8	47.7	9.1	300	910
6	120.8	178.3	70.3	11.6	250	1250
7	327.6	411.4	27.3	0	210	340
8	126.4	293.0	50.7	0	530	1020
9	176.6	481.5	60.9	0	440	340
10	184.1	290.6	67.6	38.2	320	340
11		375.9		0		1020
12		295.9		0		680
Average	216.6	322.2	49.2	5.8		
t-test	*		*			

on the tree trunk. But in the case of multiple point inoculation, bundles were placed on different sites. Average weight of broodlac bundles were 113 g For the single point inoculation, 31 bundles and for the multiple point inoculation, 66 bundles of broodlac were used. Number of bundles were determined depending upon inoculable shoot length available on the tree. In the single point placement method, lac larvae had to move a long distance to settle on farthest branches, while in the multiple point placement method, broodlac bundles were placed in close proximity to branches to facilitate quick settlement of lac insect larvae.

Observations on shoot length, length of lac insect settlement, number of unsettled branches and distance of branches from place of inoculation were recorded for each and every branch of host trees in all the experimental trees.

Results & Discussions

The statistically significant differences in lac insect settlement due to placement of broodlac were observed. Average settlement per 100 g

broodlac in multiple point inoculation was found to be 48.7% higher than single point inoculation (Table 1). Per cent settled branches in multiple point broodlac inoculation were almost 7 times higher than that of single point inoculation. Perusal of data recorded from the present investigation clearly indicate that multiple point inoculation proved to be more efficient and effective than the single point inoculation with respect to lac insect settlement area. During the course of settlement lac insects try to settle on the first shoot followed by the next and so on. By single point inoculation large number of larvae start swarming from a single point and settle overcrowded on the front lying shoots leaving others unsettled. As a result, large number of unsettled branches were found in case of single point inoculation.

To assess how lac insect settlement percentage of shoot length is affected due to placement of broodlac at different distances on single site inoculation, correlation coefficient between the two was calculated based on 97 observations. Estimate was worked out to be -0.139 which was statistically significant.

The study revealed that per cent settlement of lac insect and distance of placing broodlac for inoculation are negatively correlated. Since it is able to explain a meager amount of variation in lac insect settlement, regression equation is not recommended.

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