

## SURVEY OF INSECT AND MITES PESTS, AND OTHER PROBLEMS RELATED TO LITCHI CULTIVATION FACED BY GROWERS IN DINAJPUR

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### ABSTRACT

A survey was conducted on the insect and mites pests, and other problems related to litchi cultivation faced by litchi growers at a village-Mashimpur, known as a capital of litchi growing area in Dinajpur. Farmers' comments indicated that fruit borer *Argyroploce illepidata*, leaf curl mite *Aceria litchii* and leaf-miners *Acrocercops* spp. were serious (major) pests where as leaf eating caterpillar, bark eating caterpillar *Indarbela* spp, snow scale insect *Chionaspis* sp, shoot borer *Chlumetia transversa* and lac insect *lacca* spp. were minor pest. Burning of skin of the fruits, falling down of very young fruits, lack of marketing facilities, lack of purity of insecticides and other agricultural impure, absence of flowering of some litchi plants are major problems of the farmers. Thirteen types of insecticides were used by the farmers and 66% of them used Ripcord 10EC followed by Agromything (32%), Basudin 10G (6%). Removal of mite infested plant parts during fruit harvesting is also done by some (21%) farmers. Liquid organic fertilizer-the Ocojeam was used as vitamin by 36% farmers and Folimore PGR (Triacantanol) by 30% farmers. The highest 41 % farmers took advice (information) for the control of insect pests from the dealer of insecticides and fertilizers and 38 % farmers use their own experience for the control of insect pest.

**Keywords:** Survey, litchi, growers, insect, mites, pests, other problems.

### INTRODUCTION

Litchi cultivation is affected by the insect pests, which makes loss of not only the production but also of the quality of the litchi, for example due to infestation of fruit borer *Argyroploce illepidata*, the fruits emit foul smell and reduce market price very greatly (Jha and Sen-Sarma, 2003). The leaf curl mites puncture and lacerate the tissues of leaf with their stout rostrum and suck the cell sap. Chocolate brown velvety growth (erinoze) on the ventral surface of infested leaves is the characteristic symptom of attack by this pest. In the beginning, small deep excavated pits may be found lined throughout with brownish velvety pubescence and when these coalesce, the leaves curl up epically or double over vertically forming hollow cylinders, ultimately the attacked leaves wither and fall down. Besides the leaves, sometimes flower buds and immature fruits are also attacked (Alam and Waded, 1964). The mite also causes the leaf curl disease of litchi (Ghai, 1976). Leaf miner *Acrocercops* sp. bores the midrib near the base of the leaf and tunnel upwards, mining the lamina of both sides of the midrib. The mined portion develops rust red and if the attack is serious the entire leaf dries up (Butani, 1979). So, insect pests are a serious problem for litchi cultivation in Bangladesh.

Litchi is one of the most popular fruits in Bangladesh and may be grown in all the districts of Bangladesh but at present it is successfully grown in Rajshahi, Dinajpur, Rangpur, Jessore, Pabna, Chittagong, Dhaka and Mymensingh (Mondal and Amin 1990; Salam, 2000). In recent years, it is a major fruit crop in Dinajpur and every year thousands of hectares of land of Dinajpur, Thakur Gaon., Panchagor, Rangpur come under litchi cultivation. Alam (1974) reported that different good varieties of litchi grow in the northern region of Bangladesh.

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An understanding of insect pest attack and the associated factors would be helpful to the planners and extension workers to devise strategies and courses of action for effectively controlling the insect pest attacks. But it has been seen from the review of literature that recent research on insect pests and other problems related to litchi cultivation faced by litchi growers is absent in the northern region. Even in Bangladesh, only Salam, (2000) work on the “Incidence of litchi mite *Aceria litchii* Keifer on some litchi varieties and its control” at Mymensingh. Keeping this point in view a study was taken- to know the different insect pests attack to litchi plant, other problem faced by the litchi growers, pest management practices used by the growers, the different varieties of litchi cultivate at Dinajpur, different information sources used by the growers, their sources of loan, amount of loan and cultivation of relay crops in the litchi field.

## MATERIALS AND METHODS

Mashimpur is known as capital of litchi growing area, a village of 6 no. union of Sador thana, Dinajpur was selected for this survey. Data were collected on 20.05.09 to 29.06.09 from 50 farmers. The interview schedules containing direct questions were used for collection of data. Data were converted into percentage and compiled in tables. Based on review of literature it was first surveyed how many insect pests attack in litchi plant in HSTU Campus and adjacent village. A colour photograph (laminated) of these insect pests and their nature of damage was shown to the farmers, explained and asked them whether the insect pests are major, minor or absent as well as asking question mentioned in the objectives.

## RESULTS AND DISCUSSION

**Major and minor insect and mite pests:** Eight insect species attacked litchi plant. But total 66% - 78%, and farmers claimed that leaf curl mite *Aceria litchii*, fruit borer *Argyroploce illepida*, leaf miners *Acrocercops* spp., were major (Table 1).

Table 1. Comments of litchi farmers (%) about intensity of attack of different litchi pests

Insect and mite pests	Family	farmers (%) about intensity of attack of litchi plant		
		Major	Minor	Not found
i) Litchi mite( <i>Aceria litchii</i> )**	Eryophidae	72	22	6
ii) Litchi fruit borer ( <i>Argyroploce illepida</i> )**	Eucosmidae	78	15	2
iii) Litchi leaf-miners ( <i>Acrocercops</i> spp.)**	Gracillariidae	66	32	8
iv) Bark eating catterpillar ( <i>Inderbela</i> spp.)*	Metarbelidae	40	40	20
iv) Leaf eating catterpillar ( <i>Oenosilpa</i> spp.)*	Noctuidae	30	40	20
v)The snow scale ( <i>Chionaspis</i> sp)*	Coccidae	25	44	31
vi) Kerrid scale ( <i>Kerria lacca</i> )*	Lacciferidae	7	37	60
vii) Shoot borer ( <i>Chlumetia transversa</i> )*	Noctuidae	1	5	94

\*\* Major pest \* minor pest

Total 40 % farmers reported that leaf eating caterpillar *Oenosilpa* spp., bark eating caterpillar *Indarbela* spp., were minor. Very few farmers opined that snow scale insect *Chionaspis* sp, Kerrid scale *Kerria lacca* and shoot borer *Chlumetia transversa* were very serious. So, they were minor pest (Table 1).

Alam (1974), Scanlan (1995) and (Salam, 2000) reported that leaf curl mite *Aceria litchii* Keifer is the most destructive pest of litchi trees in Bangladesh. Puttarudrinah and Channa (1959) cited that Litchi mite *Aceria litchii* Keifer is a major pest of litchi and has been reported from almost all the litchi growing countries of the world. Litchi fruit borer and litchi leaf minor are very common pest but snow scale *Chionaspis* sp.(Coccidae- Hemiptera ) is a minor pest of litchi in Bangladesh (Alam, 1974). Bose and Mitra (1990) reported that bark eating caterpillar/ wood- boring moth (*Indarbela* spp.) are not any major importance of litchi. (Butani, 1979) reported that shoot borer *Chlumetia transversa* is a minor pest of litchi. Jha and Sen-Sarma (2003) reported that lac insect occasionally attacks litchi plant.

**Problems of litchi farmers:** Correct identification of any problem makes it easy to solve. Litchi farmers were mostly illiterate. So, not all farmers were able to express their problem correctly but those who (a few) somewhat literate expressed their problem very effectively, but their percent was less. Consequently, the problems are summarized as rank (according to the highest % of farmers claim) wise-

Problems	Rank (on the basis of descending %)
Burning of fruit skin (exocarp) during high temperature and hot wind and leading to lower market price	1
Insect infestation	2
Fruit drop at very young (immature) fruit stage	3
Lack of training facilities	4
Lack of marketing facilities and have to go to sell fruit to the new market (in front of Sadar Thana) of Dinajpur. It requires money and by making a syndicate the clients pay less money, i.e. the middle man exploits them.	5
Abnormal size of fruit; some are normal and some are very small size in the same bunch	6
Block supervisors and agriculture officers (SMO) never go to them	7
Lack of credit facilities	8
After raining the mature (ripen) fruits drop and rupture	9
Lack of purity of insecticides and other agricultural impute; TSP fertilizer is not dissolved even in 6 months	10
They wish to sell the fruit too late (after 7 days to 10 days) to get high price, but it is quite impossible due to lack of preservation facilities	11
When and how to use insecticides and type of insecticides (a great problem)	12
Non flowering of some plants	13

#### **Varietal susceptibility to pests:**

Table 2 indicates that Bedana variety was susceptible to litchi mite and Bombai variety was susceptible to litchi fruit borer and leaf- miners. Bedana variety was susceptibility to litchi mite and very similar opinion was also given by Salam, (2000), who showed in a research (at BAU Campus, Mymensingh) that Bedana variety was very susceptible to litchi mite and number of infested twigs per plant was 25.62 and infested leaf per plant 50.82; whereas in Chaina-3 it was in 19.50 and 3 8.89, respectively.

**Management practices used by the litchi farmers:** Farmers used 13 types of insecticide but 66% (highest %) farmers used Ripcord 10EC insecticide followed by Agromything (32%), Basudin 10G

(6%), and Santaf (6%). Other insecticides were used by a very negligible number of farmers (Table 3).

Table 2. Comments of litchi farmers (%) about susceptibility of different litchi variety

Pests	litchi farmers (%) spontaneously comments	litchi farmers (%) no comments
Litchi mite ( <i>Aceria litchii</i> )	61 (it is very serious in Bedana)	39
Litchi mite ( <i>Aceria litchii</i> )	28 (less in Madrajee)	72
Litchi fruit borer	30 (it is very serious in Bombai, especially after rain)	70
Litchi leaf- miners	25 (it is very serious in Bombai)	75

Farmers also used fungicides as insecticide (a misconception) such as Redomil Gold MZ 68 WP (6% farmers) Bavistin DF (Carbendism, 4% farmers) and Noem (Carbedism, 4% farmers).

Farmers also used liquid organic fertilizer and seem as vitamin such as Ocojeam 36% and Folimore PGR (Triacontanol) 30% farmers (Table 3).

Table 3. Farmers(%) management practice (using pesticide and fertilizers, and others in litchi field)

<b>Insecticides</b>	<b>% Farmers use</b>
Ripcord 10 EC	66
Agromythine	32
Agrofuram	2
Basudin 10 G	6
Santaf	6
Syntra	1
Fanfan	4
Fencid	2
Captaf	2
Pepsin	2
Fighter 2.5 EC ( Lamdacyhalathrin)	2
Froctine	2
Do not use insecticide	6
Do not like to use insecticide	4
<b>Fungicide used as insecticide</b>	
Bavistin DF (Carbendism 50 %)	4
Raedomil Gold MZ 68 WP	6
Noem (Carbedism)	4
Tilt 25 EC (Propiconazol)	6
<b>Liquid fertilizer used as vitamin</b>	
Ocojeam (Extract of sea algae; organic fertilizer)	36
Folimore PGR (Triacontanol)	30
Biotek	10
<b>Others management practices</b>	
Removal of mite infested plant parts	21%
i) Removal of mite infested plant parts and throw water	1%
Removal of mite infested plant parts and burning	1%

**Other management:** 21% farmers remove the mite infested plant parts (infested branch) during harvesting to control litchi mite and keep it under the plant; so, there is a possibility about infest again but only 2% farmers control litchi mite in proper way as they remove the mite infested plant parts and throw them pond water 1% and burn it 1% (Table 3).

Litchi mite was one of the important pests of litchi but no farmers used miticides instead they used fungicide; however disease of litchi is negligible. It is serious defect of our Extension and communications. Gupta *et al.* (1997) pointed out that removal and burning of the infested plant parts (leaf and twig) were very effective for the management of litchi mite. Similar opinions also have been given by Prasad and Singh (1981)

#### Litchi variety cultivated in Dinajpur:

Farmers cultivate eight varieties of litchi viz. Madrajee, Bedana, Bomby, Chaina-3, Kanthalee, Elachee, Golapee, and Shetapatee. Farmers had 100, 88, 70, 22% Madrajee, Bedana, Bomby, Chaina-3 varieties, respectively. It may be cited that 32% farmers have Madrajee + Bedana+ Bomby varieties; 32% farmers had Madrajee + Bedana varieties; but Kanthalee, Elachee, Golapee. A negligible percent of farmers (8, 6, 4, and 2, respectively) cultivated Shetapatee; the last four varieties were newly introduced varieties from the adjacent country India (Table 4)

Table 4. Percentage of Farmers cultivating different varieties of litchi

Variety	Farmers (%) cultivating litchi	Total no. of plant of different varieties/50 farmers
Madrajee	100	1442
Bedana	88	247
Bomby	70	292
Chaina -3	22	37
Kanthalee	8	13
Elachee	6	5
Golapee	4	2
Shetapatee	2	2
Madrajee + Bedana	24	1693
Madrajee + Bedana+ Bomby	32	1985

Total area of land of 50 litchi farmers had 40.23 ha and they used for litchi cultivation 14.71 ha of land. Farmers of 22% cultivated relay crops when the litchi plant is very young. Sources of loan were Krishi Bank- (4%), BRDP (4%), Co-operative Society (4%), Friends (4%), Grameen Bank (4%), BRAC Bank, (4%) ASA (4%) and only 2% farmers used loan for litchi cultivation (Table- 5).

Table 5. Land area of 50 farmers, relay crop and sources of land

Total amount of land of litchi farmers	Total land for litchi cultivation	of use for litchi relay crops	% Farmers cultivate relay crops	Name of relay crops	% Farmers take loan for agriculture	Sources of loan	of loan used for litchi cultivation
40.23 ha	14.71 ha	22		Rice, ladys finger, puisak, brinjal, potato, moris, corla, cucumber, turmeric, ber, banana ;when litchi plant is young)	31 (range of loan-10 to 30 thousands )	Krishi Bank- (4%), BRDP (4%), Co-operative Society (4%), Friends (4%), Grameen Bank (4%), BRAC Bank, (4%) ASA (4%)	2

Farmers used five sources to take information viz. dealer of insecticides and fertilizers, relatives and friends, other farmers, agricultural officers and company. The highest of 41 % farmers took information from the dealer of insecticides and fertilizers; 38 % farmer did not use any source (they applied their own experience); 10 % farmer took advice from the relatives and friends; and very negligible % farmers used other sources for the control of insect pest (Table 6).

Table 6. Percentages of sources of (information) for the control of insect and mite pests

Sources of advice (information)	Farmer (%)
Dealers of insecticides and fertilizers	45
Self (use own experience)	38
Relatives and friends	10
Other farmers	4
Agricultural officers (due to personal relationship)	2
company (due to personal relationship)	1

## CONCLUSION

Litchi mite and fruit borer were the serious pests of litchi; litchi mite reduced yield through affecting the photosynthesis but fruit borer directly affect the fruits and by reducing market price. So, it is necessary to develop integrated pest management to control the pests. Problems of the litchi farmers were lack of training facilities and marketing facilities; when, how and what types of insecticides used in the litchi growers. From the sources the following suggestion could be made- development of a market at Mashimpur village for marketing facilities, arrangement at least 15 days training of the litchi farmers, development of an agricultural extension office at Mashimpur village, supply of agricultural imputes at low costs and arrangement of loan without interest, if required

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