OBSERVATIONS ON THE RELATIVE SUSCEPTIBILITY OF THREE VARIETIES OF COTTON TO *APHIS GOSSYPII* GEVER

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Aphis gossypii Gever, the cotton aphid, is one of the more common and serious pests of cotton in the dry zone. The minute insects infest the tender portions of the plant in colonies and suck up the plant sap. The drainage caused to the plant by thousands of these creatures produces an unhealthy effect. The leaves become curled up, the tender portions fade gradually and the whole plant becomes blighted in a bad attack.

During routine checks on the pest, marked variations in the pest populations was observed in different varieties growing side by side. The present study is to ascertain if the difference was significant.

EXPERIMENT

OBSERVATIONS were made on three varieties of cotton, namely, Sea Island " Andrews " variety (*Gossypium barbadense*) and the upland varieties HC 101 and LL 53 (*G. hirsutum*). The varieties were planted at 3 ft. × 2 ft. spacing in plots 34 ft. × 14 ft. Each variety was grown under three fertilizer treatments, Nil, 40 lb. each of N and P_2O_5 and 80 lb. each of N and P_2O_5. N was applied in three split doses, first at the time of planting and then at three weeks and six weeks after planting. P_2O_5 was applied at the time of planting. There were four replications.

RESULTS

THE results of the observations taken from 60 plants of each variety are given below in Table 1 and represented in Figure 1. It was observed that there was difference in the aphid infestation in the variety at different fertilizer levels. The observations for the Sea Island Variety for the three fertilizer levels is given below in Table II and also represented in Figure 2.

TABLE 1

Aphid Counts taken from Sixty Selected Plants from the Three Varieties

Variety	*Age of crop in weeks*							
	8	10	11	12	13	14	15	16
HC 101	4,900	11,000	15,000	1,300	915	2,350	2,800	1,135
Sea Island	580	875	215	100	15	215	10	20
LL53	2,400	6,050	3,300	1,300	1,000	2,000	2,200	1,500

TABLE II

Aphid counts taken on Sea Island variety at Three Fertilizer Levels

Fertilizer Level	*Age of crop in weeks*							
	8	10	11	12	13	14	15	16
Nil	25	255	55	0	10	80	10	5
40 lb. N & P_2O_5	75	150	90	45	5	70	0	0
80 lb. N & P_2O_5	490	470	70	55	0	65	0	15

DISCUSSION

FROM the observations it is clear that aphid infestation on Sea Island variety was significantly lower than in the other two varieties showing that this variety exhibits some form of resistance to aphids. It is difficult to state with any degree of certainty the particular attribute of the plants which confers this resistance. But evidence seems to suggest that hairiness of the leaves may have something to do with it. On the average leaves of Sea Island cotton have 1-5 hairs per square inch on the under surface whereas HC 101 has 500-600 and LL 53 has 800-900 hairs per square inch.

Peat (1928) found in South Africa that hairy cottons such as Cambodia suffered more than glabrous ones from aphid attack. Dinnam and Clark (1938) working in Mississippi, U.S.A., found that in a group of cotton varieties showing different levels of pilosity, the aphid population increased in direct proportion to the number of hairs on the lower leaf surfaces. In the present observation too it has been found that aphid infestation was lowest in the less hairy variety.

In nature aphids are controlled in varying degrees by natural enemies. Of these the more important are the larvae of a lady bird beetle, a hover fly and a lacewing fly. These larvae move freely on the under surface of the leaves and devour the aphids voraciously. Hairiness of the leaf is probably a hindrance to the free movement of these natural enemies and the aphids found among the hairs may not be easily accessible to the predators. Therefore resistance to aphids is probably a factor connected with predator activity on the

plant. Dinnam and Clark (1938) also observed that parasitism was greater in glabrous types of cotton with smaller aphid population. Here too hairiness of the leaves may make aphids less accessible to the parasites.

It was observed in the present study that with increased application of fertilizer the susceptibility to aphid infestation increased in all three varieties. This increase was more marked in the more resistant Sea Island variety. Probably more fertilizer, mainly the Nitrogen component, made leaves more succulent and therefore more attractive to aphids. Christidis and Harrision (1955) also reported that plants grown on soils well supplied with nitrogen were more favourable to aphid development. Another experiment is in progress with varying levels of nitrogen only to ascertain this fact.

SUMMARY

OBSERVATIONS made at Maha Illuppallama show that Sea Island Cotton variety, "Andrews" (*Gossypium barbadense*) is less susceptible to infestation by *Aphis gossypii* than the upland cotton varieties HC 101 and LL 53 (*G. hirsutum*). There was no difference in the succeptibility between HC 101 and LL 53.

In the very high fertilizer treatments all varieties showed greater susceptibility to aphids than in the moderate and no fertilizer treatments. This effect was, however, more marked in the "Andrews" variety.

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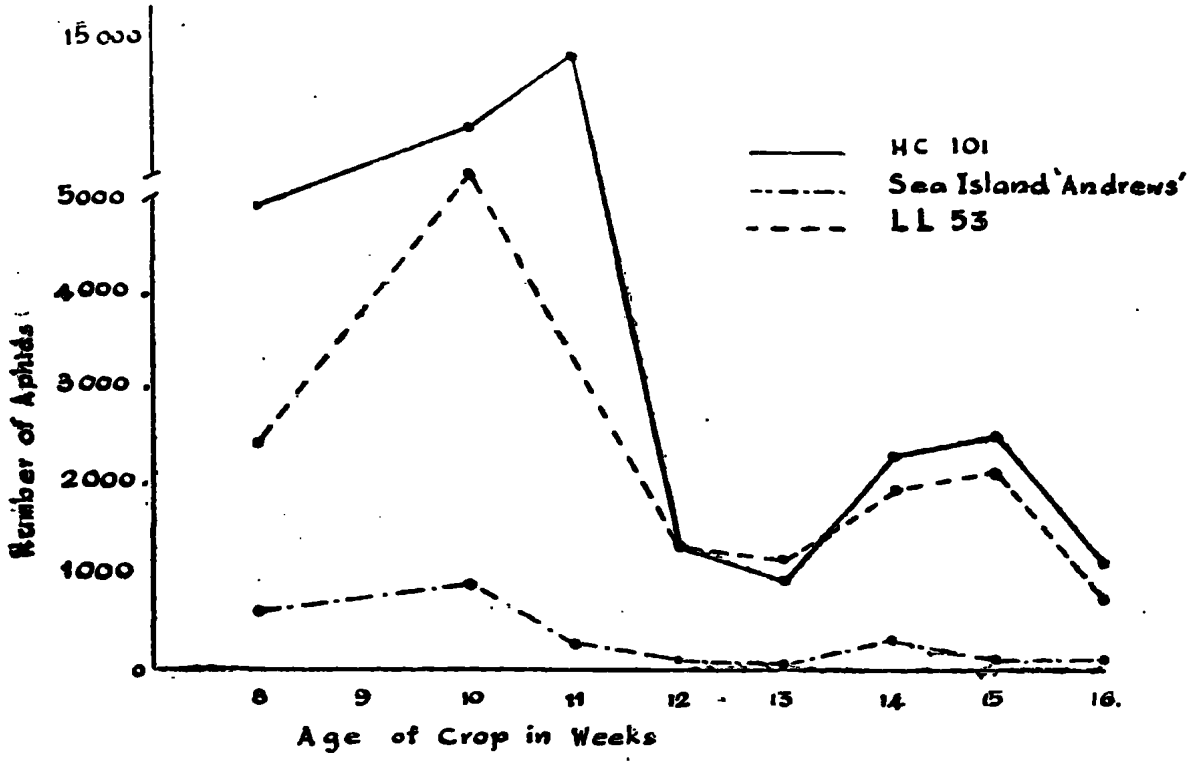

Fig. 1—Aphid counts taken from sixty selected plants in three varieties.

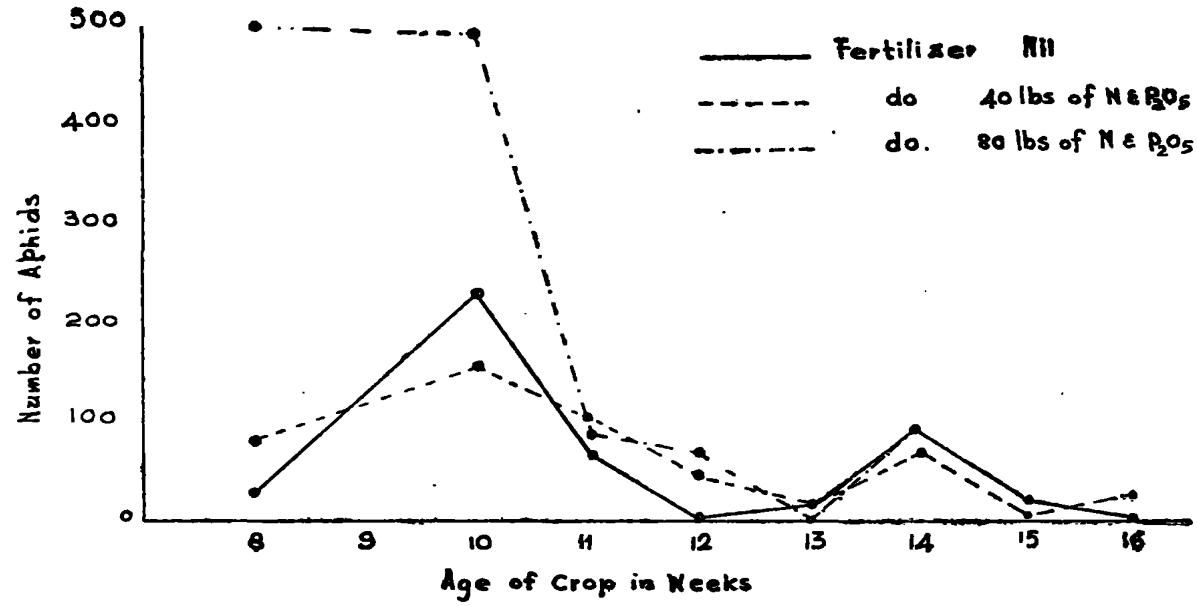

Fig. 2—Aphid counts taken from twenty plants of Sea Island variety at three fertilizer levels.