

Relation of Groundnut Aphid Population with Its Natural Predator, Lady Bird Beetles

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The aphid, *Aphis craccivora* Koch, is a serious pest of groundnut *Arachis hypogaea* L., in the Saurashtra region of Gujarat State. The aphid infests the groundnut crop throughout the year as the groundnut crop is now cultivated throughout the year in *kharif*, *rabi* and summer seasons in Saurashtra region of the State. Patel *et al.* (1976) reported on the relationship between groundnut aphid and its predator, lady bird beetles population during *kharif* season. But this type of work has not been carried out in summer season and hence this study was undertaken during summer 1981. During March and April, 1981 infestation by this species was noticed in groundnut crop in Junagadh area. The pest was first observed in the second week of March with 0.2 aphid index per plant. The aphid infestation spread very rapidly and built up large colonies on

the tender shoots on different branches with 2.9 aphid index per plant. For recording all the observations 25 groundnut plants were randomly observed. The aphid index was worked out by applying the following method (Anonymous, 1977).

Aphid index Degree of infestation on plant

- | | |
|---|--|
| 0 | Plant free from aphid |
| 1 | Aphid present, but colonies did not build up. No injury due to pest apparent on the plant. |
| 2 | Small colonies of aphid were present on the tender plant parts. Such tender parts exhibited slight curling due to aphid feeding. |
| 3 | Large colonies of aphid were present on tender plant parts. Counts were possible and tender plant parts showed damage symptoms due to aphid feeding. |
| 4 | Entire plants were covered by aphid. Counts were impossible and plants showed damage symptoms due to aphid feeding. |

Formula for working out aphid index:

Average aphid index per plant

$$= \frac{0N + 1N + 2N + 3N + 4N}{\text{Total number of plants observed}}$$

Where = 0, 1, 2, 3, 4 are aphid index

N = Number of plants showing respective aphid index.

The predators coccinellids collected were indentified as *Hippodamia variegata* (Goeze), *Coccinella septempunctata* Linnaeus and *Menochilus sexmaculatus* (Fabricius). The data presented in Table-1 indicate that in the beginning of aphid incidence, there was positive correlation between the aphid index and population of active stages of lady bird beetles during the month of March, 1981. But aphid population decreased with the increased population of the natural enemy during the peak period of aphid infestation in the month of April, 1981. The population of predators declined by the first week of May when each plant had only 3.30 lady

bird beetles indicating that most of them must have migrated to other areas due to decrease in host insect on crop plants. More or less, similar trend was also observed by Patel *et al.* (1976) in *kharif* groundnut cultivation in Central Gujarat. Thus lady bird beetles played a very important role in controlling such infestation of groundnut aphid in summer season as a natural control agent saving the cost of insecticidal application. This also indicates that it is possible to check the aphid infestation in other endemic areas by early release of laboratory reared lady bird beetles.

TABLE 1

Relation between aphid population and lady bird beetles in Saurashtra region of Gujarat State.

Period of observation	Aphid index/ plant	Average population of different stages of lady bird beetles/10 plants			Total no. of active stages of lady bird beetles/10 plants
		Larvas	Pupae	Adults	
1st week of March	0.0	0.0	0.0	0.0	0.0
2nd week of March	0.2	0.0	0.0	1.2	1.2
3rd week of March	1.2	1.6	0.0	2.5	4.1
4th week of March	1.6	2.5	0.9	3.2	5.7
1st week of April	2.9	5.0	8.0	4.0	9.0
2nd week of April	2.4	6.6	16.0	3.3	13.90
3rd week of April	1.2	12.00	16.6	6.0	28.00
4th week of April	1.2	0.0	0.0	10.6	10.6
1st week of May	0.6	0.0	0.0	3.3	3.30
2nd week of May	0.4	0.0	0.0	3.3	3.30
3rd week of May	0.4	0.0	0.0	5.3	5.30
4th week of May	0.3	0.0	0.0	1.3	1.3

Thus it may be concluded that there is no need to apply insecticide to summer groundnut to check the aphid infestation, if predators lady bird beetles are present in the groundnut crop. This is because, in summer season, the aphid-infestation does not go so high as in case of *kharif* season due to high temperature.

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REFERENCES

- Anonymous, 1977. Report of the entomological work done during the year 1976-77 *kharif* season in oilseeds, GAU, Junagadh.
- Patel, R. C., D. N. Yadav and J. R. Patel, 1976. Natural control of groundnut aphid *Aphis craccivora* Koch, in central Gujarat, *Curr. Sci.* 45 (1): 34-35.

Treatments	Number of ladybird beetles per plant		Number of aphids per plant		Remarks
	Before	After	Before	After	
1. Control	0.0	0.0	0.0	0.0	
2. 10% DDT	0.0	0.0	0.0	0.0	
3. 20% DDT	0.0	0.0	0.0	0.0	
4. 30% DDT	0.0	0.0	0.0	0.0	
5. 40% DDT	0.0	0.0	0.0	0.0	
6. 50% DDT	0.0	0.0	0.0	0.0	
7. 60% DDT	0.0	0.0	0.0	0.0	
8. 70% DDT	0.0	0.0	0.0	0.0	
9. 80% DDT	0.0	0.0	0.0	0.0	
10. 90% DDT	0.0	0.0	0.0	0.0	
11. 100% DDT	0.0	0.0	0.0	0.0	
12. 110% DDT	0.0	0.0	0.0	0.0	
13. 120% DDT	0.0	0.0	0.0	0.0	
14. 130% DDT	0.0	0.0	0.0	0.0	
15. 140% DDT	0.0	0.0	0.0	0.0	
16. 150% DDT	0.0	0.0	0.0	0.0	
17. 160% DDT	0.0	0.0	0.0	0.0	
18. 170% DDT	0.0	0.0	0.0	0.0	
19. 180% DDT	0.0	0.0	0.0	0.0	
20. 190% DDT	0.0	0.0	0.0	0.0	