

Reproduction and Population Dynamics of Groundnut Aphid

(*Aphis craccivora* Koch)

G. M. Talati and P. G. Butani

Department of Entomology, Gujarat Agricultural University, Junagadh Campus, Junagadh

Groundnut is mainly cultivated in Saurashtra (Gujarat) in *kharif*, occupying almost 11,38, 168 hectares. In the event of serious attack of aphid the crop suffers considerably (Gullamullah, 1940). The aphid attack the crop in its early stage when the crop is in active growth phase. Patel and Talati (1973) have reported sticky trap as an effective surveillance technique, for this aphid pest in groundnut. The pest multiplies rapidly because of parthenogenetics and viviparous reproduction. Hence it is the experience of many farmers of Saurashtra region that once the aphid infestation has taken place on groundnut plants, permanent damage is done. In view of the above, investigations were carried out at Junagadh, to study reproduction and population dynamics of the black aphid (*A. craccivora*)

Five batches of aphid, consisting five adult aphid in each were reared, on tender groundnut shoots and observations were recorded regarding the type of reproduction. When the adults died, they were replaced by new ones. The reproductive capacity and rate of reproduction per day were studied on ten adult aphids, observations were started soon after 4th nymphal moult-

ing. The adult aphid were reared individually in separate petridishes in the laboratory, providing groundnut shoots as food. Daily morning counts were taken on new nymphs laid. The nymphs, after counting were removed from the petridishes to get correct data. To assess the reproductive capacity of a single adult aphid, in protected condition, one newly moulted adult was placed on a growing groundnut plant in pot under caged condition. Daily records were made of nymphs laid. Thus total number of nymphs and adults found in the colony was worked out at the end of 15 days. Such study was made on 10 newly moulted aphids separately.

Type of Reproduction :

Parthenogenetical viviparity in aphid is very well documented in literature, though oviparous type of reproduction in certain aphid species is reported. A complex cycle of reproduction in aphids have been discussed by Wigglesworth (1965). In laboratory only parthenogenetic viviparous reproduction was observed through out the year. No males were noted at any time. While laying nymphs, the adult took support of host plant with its fore-legs, while the hind pair of leg guided exit of nymph.

Reproductive Capacity :

The rate of reproduction per day varied from 1 to 13, while total nymph laying capacity of an adult female varied from 38 to 99, at the prevailing temperatures, ranging from 22° C to 28° C. The reproductive capacity tended to

REPRODUCTION AND POPULATION DYNAMICS OF GROUNDNUT

TABLE 1

Reproductive capacity of groundnut aphid (*A. craccivora*) in laboratory.

Reproductive capacity of groundnut aphid (<i>A. craccivora</i>) in laboratory.														
Period of Study	Temperature (°c)			R.H. (%)			Nymphs observed			Nymphs laying capacity per day			Total reproductive capacity	
	Min.	Max.	Av.	Min.	Max.	Av.	No.	Min.	Mix.	Av.	Min.	Max.	Av.	
10-2-72 to 21-2-72	18.9	24.4	21.68	34	65	52.54	10	1	10	6.10	46	61	53.7	
5-3-72 to 19-3-72	22.2	32.2	27.25	36	61	52.20	10	1	13	7.36	82	99	88.4	
6-8-72 to 16-8-72	27.8	31.1	29.5	75	96	87.8	10	1	10	5.34	38	62	51.8	
8-11-72 to 20-11-72	26.7	32.2	28.69	44	55	51.50	10	1	10	6.59	48	78	64.6	
20-12-72 to 3-1-73	21.1	26.7	23.75	38	56	48.8	10	1	13	7.15	68	83	75.8	

TABLE 2

Population dynamics of a single young adult groundnut aphid (*A. craccivora*) in laboratory.

Periods in days from starting	Minimum population in colony		Maximum population in colony		Average population in colony	
1st	6		10		7.9	
2nd	16		20		17.7	
3rd	23		28		25.8	
4th	34		39		37.4	
5th	42		49		46.3	
6th	53		56		54.3	
7th	62		65		63.5	
8th	92		107		100.5	
9th	168		189		179.3	
10th	315		345		338.9	
11th	510		542		532.0	
12th	789		835		813.7	
13th	993		1089		1017.9	
14th	1362		1440		1403.0	
15th	1688		1862		1743.2	

go down when temperatures were below 22° C or above 28° C (Table 1).

Population Dynamics :

The population build up of a single gravid adult (Table 2) went up to 1743.2 young ones and adults on an average in 15 days. The build up upto 7 days was of the order of arithmetical progression, but beyond 8 days the multiplication assumed geometric proportion. This phenomena was due to the added reproduction commenced by the older nymphs. It was also observed that only in one case, single aphid produced a colony in 15 days time, con-

sisting of a maximum 1862 aphids in laboratory.

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