

DAMAGE POTENTIAL OF GROUNDNUT LEAF MINER
(Gelechiidae : Lepidoptera)*

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ABSTRACT

Pot experiments were conducted to assess the damage potential of the groundnut leaf miner, *Aproaerema modicella* Deventer. In the case of 20 and 40-day-old plants introduced separately with 2, 4, 6 and 8 larvae per plant, it was observed that the maximum damage in respect of the number of damaged leaflets and percentage of affected leaflets was inflicted within five days of introduction and afterwards there was only a slight increase in the damage. Among the two age groups, the damage was significantly more in 40-day-old plants at 15th day after introduction. The differences in the leaf area damaged between the two age groups were not significant. Cumulative damage assessed by the introductions of 2, 4, 6 and 8 larvae per plant when the plants were 20 and 40 days old showed that there was a concomitant increase in the damage with the increase in the number of larvae introduced.

KEY WORDS: Groundnut, Leaf miner, Damage potential.

The groundnut crop is attacked by insect pests of which leaf miner (*Aproaerema modicella* Deventer) popularly called as 'surulpoochi' has assumed greater importance in the recent years by inflicting severe damage. The damage is more severe during the rainfed season which accounts more than sixty per cent of the groundnut acreage in Tamil Nadu. A study on yield losses indicated that one per cent increase in the infestation resulted in a yield loss of 8.76 kg/ha (Logiswaran and Ramachandran, 1984). The damage by this pest has been reported from the States of Tamil Nadu, Karnataka,

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Andhra Pradesh, Maharashtra, Orissa, Gujarat, Madhya Pradesh, Rajasthan and Punjab (Mohammad, 1981). During the course of the various studies different authors estimated the percentage of groundnut leaflets damaged and number of larvae on plant basis. Some of these estimates were 19.73 to 55.00 per cent (Jai Rao and Sindagi, 1973), 67 to cent per cent (Sadakathulla et al., 1976), 4.5 to 14.1 per cent (Lewin et al., 1979), 2 to 25 larvae per 25 plants (Khan and Raodeo, 1978), 0.17 to 19.4 larvae per plant (Logiswaran and Madhava Rao, 1982). Present studies were conducted to find out the damage potential of the pest in relation to the age of the plant.

MATERIALS AND METHODS

Pot culture experiment was conducted on two age groups viz., 20 and 40 days-old potted TMV 7 groundnut plants. First instar larvae were introduced at the rate of 2, 4, 6 and 8 per plant. The treatments were replicated six times. The plants were covered with polythene cages after the larvae mined the leaves. The total and the damaged leaflets were assessed on the 5th and 15th day after introduction. During the observation on 15th day, the total leaf area of the affected leaf-

lets and the leaf area of the damaged portions were measured in mm^2 by graphic method. Besides, another set of plants with six replications was maintained and first instar larvae introduced twice when the plants were 20 and 40 days old. The total and damaged leaflets were assessed on 5th and 15th day of first and second introductions. During the final observation, total leaf area of the affected leaflets and the leaf area of the damaged portions were measured. The pupae formed from the larvae introduced on 20th day were removed to avoid reinfestation.

RESULTS AND DISCUSSIONS

The damage by the leaf miner at the population levels of 2, 4, 6 and 8 larvae per plant on 20 and 40 day old crop were assessed and results furnished in Table 1. The cumulative damage in two introductions are presented fig. 1.

Damage to 20 day-old plants

The larvae, in 5 days damaged 4.17 leaflets accounting for 13.92 per cent affected leaflets and this increased to 5.17 in a further feeding period of ten days resulting in 5.46 per cent affected leaflets with 237.33 mm^2 damaged leaf area. Four larvae per plant damaged

7.67 leaflets in 5 days, resulting in 22.64 per cent affected leaflets, whereas on 15th day, the damage increased to 8.17 leaflets resulting in 8.18 per cent affected leaflets with 461.17 mm² damaged leaf area. Six and eight larvae per plant damaged 11.00 and 15.83 leaflets respectively in five days with 634.67 and 747.83 mm² damaged leaf area respectively on 15th day after introduction. In all the cases, it was seen that maximum damage was inflicted within five days after introduction and afterwards there was only slight increase in damaged leaflets but the percentage affected leaflets was less because of the newly formed leaflets which were not damaged.

Damage to 40-day-old plants

Two larvae, in 5 days damaged 6.17 leaflets resulting in 6.61 per cent affected leaflets and this increased to 7.17 in further feeding period of ten days resulting in 7.58 per cent affected leaflets with 291.67 mm² damaged leaf area. Four larvae per plant damaged 9.17 leaflets in five days, resulting in 9.92 per cent affected leaflets, whereas on 15th day, the damage increased to 11.17 leaflets, resulting in 12.26 per cent affected leaflets with 395 mm² damaged

leaf area. Six and eight larvae per plant damaged 14.17 and 18.5 leaflets respectively in five days with 559.5 and 918.83 mm² damaged leaf area respectively on 15th day after introduction. As in the case of 20-day-old plants, it was seen that maximum damage was inflicted within five days after introduction and afterwards there was only a slight increase in damaged leaflets. However, in the case of 40-day-old plants, the percentage leaflets affected was slightly more on 15 days after introduction when compared with five days after introduction since the number of newly formed leaflets was less at this stage.

Among the two age groups, the damage in respect of number of leaflets and percentage leaflets affected was significantly more in 40-day-old plants at 15th day after introduction. However, the differences, in the leaf area damaged between the two age groups were not significant.

Cumulative damage in two inoculations

The two introductions at two larvae per plant when the plants were 20 and 40 days old cumulatively damaged 14.33 leaflets as observed at the age of 55 days resulting in 17.5 per

Fig. 3. CUMULATIVE DAMAGE BY *A. modicella* (INTRODUCTIONS ON 20 AND 40 DAS)

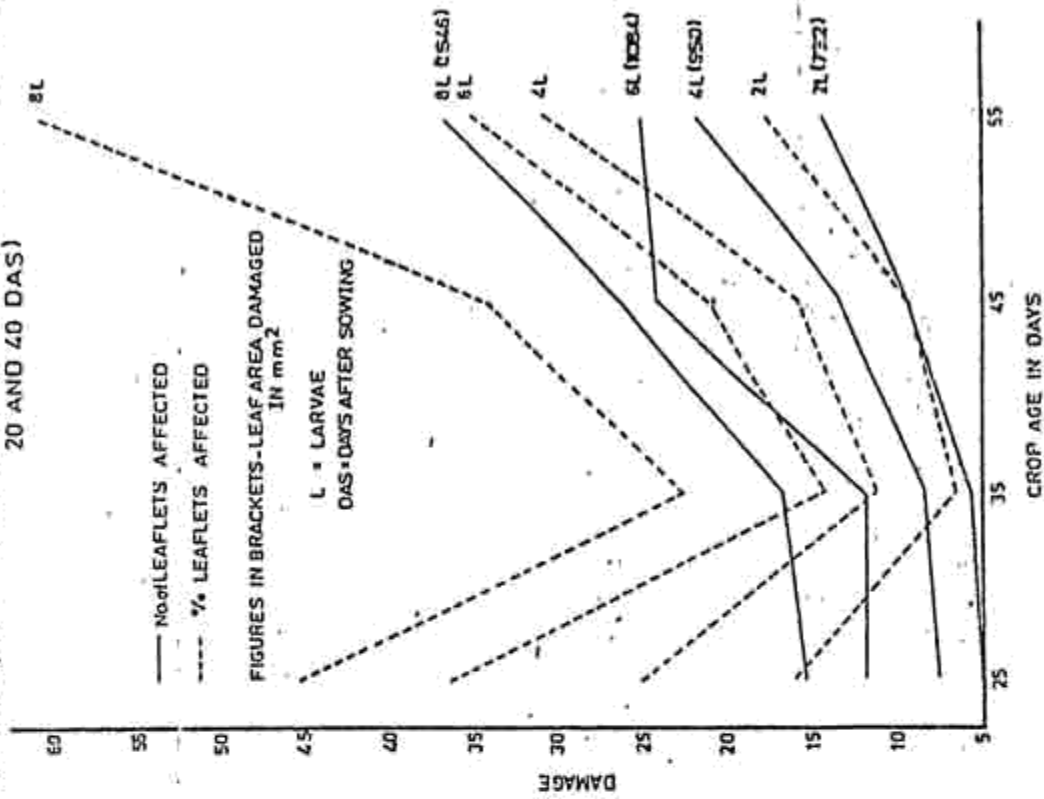


Table. Damage potential of *A. modicella* (20-day-old-plants) (Figures in parentheses are transformed values)

Larvae per plant.	% leaflets affected		Number of leaflets affected		Leaf area damage (mm ²)
	5 DAI	15 DAI	5 DAI	15 DAI	
2	13.92 (21.84)	5.46 (13.48)	4.17	5.17	237.33
4	22.64 (28.39)	8.18 (16.60)	7.67	8.17	461.17
6	32.35 (34.66)	14.47 (22.29)	11.00	13.33	634.67
8	47.95 (43.80)	19.34 (26.06)	15.83	17.17	747.83
∞ (P=0.05)	2.75	1.49	1.44	1.43	71.35
Mean	29.21 (32.17)	11.86 (19.61)	9.67	10.96	
∞ (P=0.05)	1.02		1.04		

cent affected leaflets with 732.33 mm² damaged leaf area. Four larvae per plant damaged 21.67 leaflets resulting in 30.78 per cent affected leaflets with 950.33 mm² damaged leaf area. Six larvae per plant damaged 25 leaflets resulting in 34.83 per cent affected leaflets with 1084.17 mm² damaged leaf area. Eight larvae per plant damaged 36.67 leaflets resulting in 60.7 per cent affected leaflets with 1645.5 mm² damaged leaf area.

In all the experiments there was a concomitant increase in

the number of larvae introduced. As the number of larvae increased, the damage in respect of percentage leaflets affected, number of leaflets affected and leaf area damaged also increased. However the percentage leaflets damaged had not given a correct estimate while comparing the damage to two age groups because of the difference in the total number of leaflets in 20 day and 40-day-old-plants. The results suggested that under increased population pressure in the field, plants of all ages are likely to be damaged rather extensively.

REFERENCES

- JAI RAO, K. and SINDAGI, S.S. 1973. Preliminary observations on the incidence of leaf miner *Stomopteryx subsecivella* Zell. on irradiated groundnut material. *Curr. Res.*, 2: 106-108.
- KHAN, M.I. and RAODEJ. 1978. Importance of larval parasites in the control of *Stomopteryx subsecivella* Zell. *Journal of MAU.*, 3: 261-263.
- LEWIN, H.D., SAROJA, R., SUNDARARAJU, D. and PADMANABHAN, M.D. 1979. Influence of time of sowing and weather on the incidence of groundnut leaf miner. *Indian J. agric. Sci.*, 49: 886-891.
- LOGISWARAN, G. and MADHAVA RAO, S. 1982. Control of leaf miner, *Proaerema modicella* Deventer (*Stomopteryx subsecivella* Zeller) infesting groundnut with certain systemic insecticides. *Madras Agric J.*, 69: 129-131.
- LOGISWARAN, G. and RAMACHANDRAN, M. 1984. Groundnut leaf miner and the yield losses. Paper presented at Regional Workshop on Production Techniques for Groundnut, Sesamum and Cashew in the North-Eastern zone of Tamil Nadu, Regional Research Station, Virdhachalem on 5.12.1984.
- MOHAMMAD, A. 1981. Groundnut leaf miner, *Proaerema modicella* Deventer (*Stomopteryx subsecivella* Zeller) (Lepidoptera: Gelechiidae). A review of World Literature, Occasional paper 3, Groundnut improvement program. International Crops Research Institute for the Semi-Arid Tropics, Patancheru, India. 33p.
- SADAKATHULLA, S., ABDUL KAREEM, A. SRINIVASAN, P.M. and JAYARAJ, S., 1976. Chemical control of groundnut leaf webber, *Stomopteryx subsecivella* Zell. (Gelechiidae: Lepidoptera) in Tamil Nadu. *Pesticides.*, 10 (5): 30-31.