

REFERENCES

- AGARWAL, R. A. 1959. Some parasites of sugarcane scale, *Aspidiotus (Targionia) glomeratus* Green. *Curr. Sci.*, **28**: 249-51.
- AGARWAL, R. A. 1960. The sugarcane scale, *Melanaspis (Targionia) glomerata* (Green), its biology and control. *Indian Sug.*, **10**: 523-26, 537-40 and 543-44.
- LEELA DAVID, A., V. M. KALYANARAMAN and P. S. NARAYANASWAMY. 1964. Distribution, status and seasonal variation in population density of the pests of sugarcane in Madras State. *Indian J. Sugarcane Res. Dev.*, **8**: 367-70.
- Madras agric. J. 62 (4): 238 — 239, April, 1975.
- NARAYANAN, E. S., B. R. SUBBA RAO and R. B. KAUR. 1957. Some known and new records of parasites of sugarcane scale insects from India. *Indian J. Ent.*, **19**: 144-6.
- RAO, V. P. 1970. The sugarcane scale insect *Melanaspis glomerata* (Green). *Indian Sug.*, **20**: 279-82.
- RAO, V. P., and T. SANKARAN. 1969. The scale insects of sugarcane. *Pests of Sugarcane*, Elsevier Publishing Co., London. pp. 325-42.
- THOMPSON, W. R. 1944. *A catalogue of the parasites and predators of Insect pests*. Sec. 1. pp. 149.
- THOMPSON, W. R., and F. J. SIMMONDS. 1965. *A catalogue of the parasites and predators of Insect pests*. Sec. 4: pp. 198.

Incidence of Grasshopper (*Atractomorpha crenulata* F.) on Sunflower

The grasshopper, *Atractomorpha crenulata* F., a polyphagous species, causes considerable damage to young sunflower plants. Both adults and nymphs feed on the leaves and cause characteristic irregular holes. Since no information is available on the damage by the grasshopper in sunflower, observations were taken on the seasonal damage at different periods of crop growth and the results presented.

Twelve monthly sowings were taken at the Farm of Tamil Nadu Agricultural University, Coimbatore from June 1972 onwards. The crop was sown on 1st of every month in replicated blocks. Ten plants were selected in each plot at random and the percentage of leaf damage was assessed by

noting the number of leaves damaged to the total leaves of the plant at four fortnightly intervals from 15th day of sowing.

The data (Table 1) reveal that in all monthly sowings, maximum leaf damage of 16.66 per cent was noted on 45 days old crop. The crop at 15th, 30th and 60th days recorded 11.46, 13.83 and 13.89 per cent leaf damage respectively. Significant differences in damage was also observed between different monthly sowings. In all periods of crop growth, October sowing recorded maximum leaf damage of 38.35 per cent while minimum damage of 3.11 per cent was registered by the crop sown on April. In general, it was observed that the crop sown on June,

TABLE 1. Data on percentage of leaf damage by *A. crenulata* at different growth periods of sunflower (Transformed values)

Month	Days after sowing				Mean
	15th	30th	45th	60th	
June 1972	22.70	24.88	26.94	18.51	23.25
July 1972	29.21	29.46	32.48	26.08	29.30
August 1972	23.51	20.05	26.59	26.33	24.72
September 1972	18.66	22.55	20.56	25.25	21.75
October 1972	31.18	40.04	39.86	41.49	38.14
November 1972	26.18	16.15	30.75	19.40	23.12
December 1972	10.93	20.57	14.26	17.54	15.82
January 1973	9.68	18.78	14.80	12.46	13.93
February 1973	7.70	11.35	14.73	12.32	11.52
March 1973	6.73	8.44	12.96	12.65	10.19
April 1973	6.90	8.34	13.01	11.22	9.86
May 1973	19.51	23.06	26.91	23.92	23.35
Mean	17.74	20.30	22.82	20.59	..

Source	'F' test	C. D (P=0.05)
Months	**	2.39
Sowings	**	1.38
Months × Sowings	**	4.81

** — Significant at P=0.01

July, August, September, October and November recorded more leaf damage than other monthly sowings. The damage was observed to be less in January, February, March and April sowings but this could not be found to be related to weather factors. Agarwal (1955) had also reported that *A. crenulata* was injurious throughout the year on many crops but was least so in December and January. The

population was lowest in May and continued to build up during rainy seasons.

C. RAMAKRISHNAN
N. RAJAMOHAN
T. R. SUBRAMANIAM

Department of Entomology,
Tamil Nadu Agrl. University,
Coimbatore-641003.

REFERENCE

- AGARWAL, N. S. 1955. Bionomics of *Atractomorpha crenulata* F. (Orthoptera: Acrididae) *Indian J. Ent.*, 17: 230-40.