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# Survey and management of groundnut leafminer *Aproarema modicella* (Deventer) in different parts of Haveri district, Karnataka

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**Abstract**
Roving survey was conducted in groundnut growing areas of Haveri district to investigate the infestation of leafminer population on groundnut. To conduct this investigation we have used the random roving survey in different village of district where in groundnut crop has been grown by marking the 5 X 5 meter area in the crop population and recorded the observation as no. of larvae per plant from ten randomly selected plants. During the survey the highest larval population (3.05 larvae/plant) from ten randomly selected plots were found in Savanur tq followed by Hanagal taluk (2.61 larvae /plant ) and moderate larval population were found in shiggaon, Haveri, Ranebennur and byadagi like (2.12 larvae /plant), (2.05 larvae /plant)and (1.95 larvae /plant) from ten ramdomly selected plants from each talukas respectively. The lowest larval population (1.52 larvae /plant) were recorded in Hirekerur taluk.

**Keywords:** Leafminer, groundnut, survey, larvae

## Introduction
Groundnut, *Arachis hypogaea* L., which belongs to genus *Arachis*, family Fabaceae and tribe Aeschynomenae, is a quadra foliate legume with yellow sessile flowers and subterranean fruits. It is a valuable cash crop for millions of small scale farmers in semi-arid tropics and is the principal oil seed crop in India. Its seeds are rich source of edible oil (43-55%), protein (25-28%) and also a valuable source of vitamins like E, K and B. Groundnut cake; after the oil extraction is a high protein animal feed and haulm provide quality fodder.

In India, groundnut is the principal oilseed crop and is grown in 11 states on an area of 5.98 million hectare with a production of 4.98 million tonnes of pod per annum and with an average productivity of 860 kg $ha^{-1}$ according to [1] The principal groundnut growing states of the country include Gujarat, Andhra Pradesh, Tamil Nadu, Karnataka and Maharastra accounting more than 80 per cent of the total acreage and production. In Karnataka, it is grown on an area of 0.86 million hectare with a production of 0.60 million tonnes [2].

Despite its high production potential (4000 kg $ha^{-1}$), the actual yields on farmers field are quite low (1000 kg $ha^{-1}$), largely because of insect pests and diseases. More than 350 species of insects damage this crop in different parts of the world of which the major insect pests are defoliators namely groundnut leaf miner, *Aproaerema modicella* (Deventer) and tobacco caterpillar, *Spodoptera litura* (Fab.). Sucking pests like thrips and leafhoppers are serious threat to the crop especially in recent years.

Groundnut leaf miner (GLM) *A. modicella* is an oligophagous pest and feeds only on leguminous host plants and a serious pest of groundnut in both rainy and post rainy seasons in India (Amin, 1983) [4] and of groundnut and soybean in South and South East Asia (Wightman *et al.*, 1990). The caterpillar mines the leaflet near the midrib and proceeds towards the epidermal layer. Initially short blisters like mines are seen on groundnut leaflets, but as the feeding advances the damaged leaflets turn brownish, roll, shrivel and dry up. Severely infected crops give a burnt appearance [3]. Due to infestation; there is reduction in dry pod yields. The leaf miner reduces groundnut and soybean yields by feeding on leaves, thereby reducing the photo synthetically active leaf area and the extent of losses varied from 24 to 92 per cent based on the levels of infestation and the genotype [4] hence to know the population of groundnut leafminer in Haveri district of Northen karnataka the present study has been undertaken with following objectives.

**Objective:** 1. To conduct the survey larval population of leafminer on groundnut crop in different growing areas of Haveri district

**To study the efficacy of different organic pesticides against leafminer**

Regular and indiscriminate use of broad spectrum insecticides has caused turbulence in the environment consequently it has led to many undesirable problems like buildup of insecticides resistance in insects, upset in balance of life in nature due to weakening of biotic pressure, pest resurgence, secondary pest outbreak etc., besides pollution problems.

The unilateral approach of controlling these pests by synthetic insecticides has necessitated developing cost effective, ecofriendly and safe pest control strategies without using any chemical toxicants which suits well in the organic farming. In this direction, scientific evaluation of bio-pesticides, botanicals and bio-rationals including indigenous technologies are considered as very much essential to combat insect pests which are noxious to groundnut. With these issues in backdrop the study was undertaken with the following objectives.

a) To study the bio efficacy of different organics against third instar larvae of *S. litura* and *A. modicella* under laboratory condition.
b) Field evaluation of different organics against major insect pests of groundnut

**Materials and Methods**

The roving survey on population of leafminer larvae will conduct to know the incidence of leafminer in groundnut growing area of Haveri district consisting of 7 Talukas *viz* Haveri, Ranebennur, Hanagal, Byadagi, Hirekerur, shiggaon and Savanur by selecting five villages from each Taluka and in among each village we have selected 4 groundnut field to carry out the present investigation by recording the observation on larval population as larvae per plant from ten randomly selected plant from each filed and further collected data were pooled for statistical analysis

Table: 1 Incidence of groundnut leafminer larvae in different places of Haveri district during summer 2020(No. of larvae per plant from ten randomly selected plants)

| **Talukas** | **Villages** | | | | | | **% leaflet damage** |
|---|---|---|---|---|---|---|---|
| Haveri | Guttal | kesralli | hombaradi | Negalur | Havanur | Mean | 41.0 |
| Larval population | 1.23 | 1.70 | 2.03 | 2.38 | 2.91 | 2.05 | |
| Ranebennur | Halageri | Kuppelur | Tumminkatti | Magod | Ittigi | | 39.4 |
| Larval population | 2.23 | 2.80 | 1.90 | 1.65 | 1.24 | 1.97 | |
| Savanur | Gundur | Bevinahalli | Yelivigi | shirabadagi | Chillur badni | | 3.05 |
| Larval population | 3.83 | 3.35 | 2.70 | 2.23 | 3.18 | 3.05 | |
| Shiggoan | Madly | Baada | Hugalur | Mallur | Bishettikoppa | | 2.12 |
| Larval population | 2.10 | 2.33 | 1.88 | 1.79 | 2.5 | 2.12 | |
| Hangal | Maranbida | Neralagi | Vard i | Kudla | harangiri | | 2.61 |
| Larval population | 2.71 | 3.23 | 2.15 | 2.4 | 2.48 | 2.61 | |
| Byadagi | budapanalli | Bislalli | Hedigonda | Shidenur | Gundenahalli | | 1.95 |
| Larval population | 1.25 | 2.98 | 1.8 | 1.35 | 2.4 | 1.95 | |
| Hirekerur | Rattihalli | Koda | Doddagubbi | kudupli | Dnadigihalli | | 1.52 |
| Larval population | 2.25 | 1.20 | 1.0 | 1.20 | 1.95 | 1.52 | |

**Results and Discussion:**

The survey was conducted to investigate the incidence of leafminer on groundnut crop in seven talukas of Haveri district *viz* Haveri Ranebennur, Hanagal, Byadagi, Hirekerur, shiggaon and Savanur by selecting five villages from each Taluka and in among each village we have selected 4 groundnut field to carry out the present investigation by recording the observation on larval population as larvae per plant from ten randomly selected plant from each filed during Rabi/ summer season 2020. In present study the highest larval population (3.05 larvae/plant)from ten randomly selected plot were found in Savanur tq followed by Hanagal taluk (2.61 larvae /plant) and moderate larval population were found in shiggaon, Haveri, Ranebennur and byadagi like (2.12 larvae /plant), (2.05 larvae /plant) and (1.95 larvae /plant) from ten ramdomly selected plants from each talukas respectively. The lowest larval population (1.52 larvae /plant) were recorded in Hirekerur taluk. During this study we revealed that the highest larval population were observed during mid stage of crop growth and at initial stage and last stage of crop growth the population were found less and this finding are in accordance with the findings of [5] who observed the seasonal incidence of leafminer are much lower at begenings of the season and higher level of infestation were found at he mid stage the crop. The present finding is also supported with the findings of the [6] who indicated that highest larval incidence was recorded during september season (15.4 larva per plant). The supporting literatures are less due to lack of research conducted on survey of leafminer on groundnut crop. After completion of survey work on leafminer it can be concluded that incidence of leafminer population on groundnut crop in Haveri district were moderate may be due to unfavorable environment condition.

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