



Influence of Intercrops on Groundnut Leaf miner, *Proaerema modicella* Deventer

Key words: Groundnut, Inter Crops, Leaf miner.

An experiment was conducted during 2011 *kharif* season at wetland farm, S.V.Agricultural College, Tirupati to study the impact of intercrops on leaf miner, *A.modicella* in groundnut. Red gram and castor were sown for every 7 rows of groundnut whereas cowpea and field bean for every 6 rows. Pure groundnut was also maintained. All the treatments were replicated four times. The plot size was 10X5m² which was considered as a replication. Five plants were randomly selected in each replication of treatments, number of leaf miner larvae and attacked leaves were counted on those plants at 10 days interval. The data was averaged, transformed and analyzed. The economics of each system was also worked out.

On an average, throughout the crop growth period, groundnut + cowpea intercropping system recorded less leaf miner larvae *i.e.* 2.81 /plant. Groundnut + castor system harboured *i.e.* 3.23 / plant which was insignificant with groundnut + cowpea. Groundnut + redgram and groundnut + fieldbean systems recorded *i.e.* 3.61 and 4.34 larvae/plant respectively and on par with each other. Groundnut grown as sole crop suffered with 6.81 larvae/ plant (Table 1). In terms of percent leaf damage also, similar results were obtained (Table 2). The least damage of 11.53 per cent was recorded in groundnut + cowpea where as in pure crop 20.60 per cent. The favourism of cowpea may be in two ways. One side, the plant chemicals of cowpea may show some adverse effect towards leaf miner. Other side, the humid microclimate prevails in cowpea rows may favour natural enemies of groundnut leaf miner. Srinivasa Rao *et al.*, (2004) reported the increased activity of coccinellids and spiders in leguminous intercrops. As the groundnut is the specific host for leaf miner it may not spread as easily through intercrops (non hosts) as it does in a monocrop. Baskaran *et al.*, (1993) reported that growing intercrops such as cowpea and pearl millet reduce pest damage and favours natural enemies on groundnut leaf miner. Ghewande and

Nandagopal (1997) noticed that intercrops such as pearl millet and soybean suppress leaf miner, thrips and jassids. Rajagopal and Hanumanthaswamy (2000) reported that leaf miner incidence in groundnut was lower and pod yield was higher in intercropping compared to monocropping. Groundnut + cowpea, Groundnut + sorghum and groundnut + maize had the lowest leaf miner incidence. Muthaiah (2000) reported that groundnut intercropped with pearl millet, pigeon pea and green gram had lesser incidence of leaf miner than pure crop of groundnut.

The infestation reached to maximum at 70 DAS (4.95 larvae/plant and 22.55% damage). *i.e.* during first fortnight of September. Correlation studies were carried out between weather parameters and leaf miner incidence in terms of no.of larvae/plant. The maximum , minimum temperatures and relative humidity during crop period were 32 – 38°C, 20-25°C and 60 – 85%.

The larval population had significant negative correlation with minimum temperature and relative humidity ($r = - 0.779$ and $- 0.792$ respectively) and non-significant negative association with maximum temperature ($r = - 0.112$). Sherasiya and Butani (1998) reported that maximum temperature was negatively correlated with groundnut leaf miner population. Senguttavan (1999) reported that the damage and larval population of groundnut leaf miner were significantly and negatively correlated with maximum temperature. Prasad and Gedia (2011) reported that minimum temperature and relative humidity showed significant negative correlation with leaf miner larvae during *kharif*. Net returns and B:C ratio were high in groundnut + redgram system *i.e.* 54,435 Rs/ha and 1:4.3 respectively followed by groundnut + field bean system *i.e.* 44,925 Rs/ha and 1:3.76. (Table 3) Lower net returns were recorded in groundnut + cowpea system due to poor yield of cowpea.

Table 1. *Aproaerema modicella* Deventer population (larvae/plant) in groundnut crop sown in different cropping systems.

Treatments	40 DAS	50 DAS	60 DAS	70 DAS	80 DAS	90 DAS	Mean
Groundnut + redgram	2.79 ^{ab} (1.80)	3.06 ^a (1.84)	3.82 ^{ab} (2.20)	4.23 ^a (2.30)	4.04 ^{ab} (2.29)	3.71 ^a (1.83)	3.61 ^{ab} (2.01)
Groundnut + castor	2.63 ^{ab} (1.65)	3.26 ^{ab} (1.96)	3.45 ^a (2.01)	3.75 ^a (2.17)	3.60 ^a (2.06)	3.42 ^a (2.00)	3.23 ^a (1.95)
Groundnut + cowpea	1.86 ^a (1.57)	2.77 ^a (1.70)	2.94 ^a (1.85)	3.05 ^a (1.91)	2.89 ^a (1.87)	2.57 ^a (1.77)	2.81 ^a (1.84)
Groundnut + field bean	2.02 ^{ab} (1.63)	3.72 ^{ab} (2.18)	5.17 ^{ab} (2.43)	5.45 ^{ab} (2.46)	5.14 ^{ab} (2.40)	4.49 ^{ab} (2.26)	4.34 ^{ab} (2.20)
Groundnut alone	3.2 ^b (2.05)	5.73 ^b (2.52)	8.01 ^b (3.15) ^b	8.58 ^b (3.64)	7.94 ^b (2.96)	7.42 ^b (2.84)	6.81 ^b (2.87)
Mean	2.50 (1.72)	3.71 (2.02)	4.67 (2.22)	4.95 (2.27)	4.80 (2.24)	4.32 (2.14)	4.16 (2.05)
SEm±	0.38	0.48	0.53	0.54	0.48	0.40	0.52
CD 0.05	0.46	0.63	1.04	1.19	0.89	0.76	0.91

Table 2. The per cent groundnut leaves damaged *A. modicella* larvae in different cropping systems.

Treatments	40 DAS	50 DAS	60 DAS	70 DAS	80 DAS	90 DAS	Mean
Groundnut + redgram	10.65 ^{bc} (19.15)	16.89 ^b (24.27)	19.25 ^b (26.02)	22.96 ^b (28.63)	18.13 ^{bc} (25.20)	12.14 ^{bc} (20.39)	16.67 ^b (23.93)
Groundnut + castor	9.73 ^{ab} (18.18)	16.95 ^b (24.31)	18.22 ^b (25.27)	21.06 ^b (27.32)	15.62 ^b (23.28)	10.46 ^b (18.87)	15.34 ^b (22.87)
Groundnut + cowpea	9.26 ^a (17.72)	12.10 ^a (20.36)	13.83 ^a (21.83)	15.19 ^a (22.94)	11.27 ^a (19.62)	7.55 ^a (15.95)	11.53 ^a (19.74)
Groundnut + field bean	10.20 ^{ab} (18.63)	16.71 ^b (24.13)	22.30 ^c (28.19)	25.21 ^{bc} (30.14)	18.70 ^{bc} (25.62)	12.53 ^{bc} (20.73)	17.61 ^{bc} (24.57)
Groundnut alone	14.33 ^c (22.24)	20.76 ^c (27.11)	24.10 ^c (29.40)	28.33 ^c (32.16)	21.01 ^c (27.28)	15.08 ^c (22.85)	20.60 ^c (26.84)
Mean	10.83 (19.16)	16.68 (24.04)	19.54 (26.14)	22.55 (28.24)	16.95 (24.20)	11.55 (19.76)	16.35 (23.58)
SEm±	0.53	0.78	0.77	0.97	0.99	0.87	0.84
CD 0.05	1.42	2.39	2.38	2.99	3.08	2.68	2.56

Table 3. The economics of different cropping systems of groundnut is furnished.

Treatment	Yield of base crop (kg/ha)	Yield of intercrop (kg/ha)	Net returns (Rs/ha)	Benefit cost ratio
Groundnut + redgram	1340	180	54,435	1 : 4.3
Groundnut + castor	1090	450	43,900	1 : 3.7
Groundnut + cowpea	1160	445	43,486	1 : 3.8
Groundnut + field bean	1095	850	44,925	1 : 3.8
Groundnut alone	1450	-	44,080	1 : 3.1

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