0.4 per cent, Panoram 0.4 per cent significantly improved the seed viability over control through out the 9 months of storage.

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SEASONAL INFLUENCE AND POPULATION DYNAMCS OF GREEN LEAFHOPPER ON RICE

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ABSTRACT

Seasonal trends of the green leafhopper (GLH) species studied by monitoring the pest through light trap at Coimbatore and the influence of weather factors on the population dynamics showed the peak occurrence of GLH during November followed by December. **Nephotettix virescens** (Distant) dominated over **N. nigropictus** (Stal.) throughout the year. Corresponding week's weather factors, especially the total rainfall individually influenced significantly the population of **N. virescens** and **N. nigropictus** individually as well as the total population of both the species. Weather factors that prevailed a fortnight prior to catch (the developmental period) influenced N. nigropictus alone. Corresponding week's weather factors in particular, the total rainfall influenced the population of **Nephotettix** spp. during Kar season. The total weather factors that existed a fortnight prior to catch influenced the population during late samba and navaral seasons. In all the seasons none of the individual weather factors that existed during the developmental period influenced the population.

KEY WORDS: GREEN LEAF HOPPER, RICE, SEASON, POPULATION.

Among the leafhoppers infesting the rice, two species of green leafhopper, viz., *Nephotettix virescens* (Distant) and *N.nigropictus* (Stal.) occupy top position in abundance, wide distribution and the damage caused both by direct feeding and through transmission of plant diseases. In this study, seasonal population trends of the hopper species were obtained by the use of light traps and the influence of weather factors on the population was worked out.

MATERIALS AND METHODS

The GLH population was monitored using a modified Robinson light trap, with a light source of 125 watt mercury vapour lamp stationed at Paddy Breeding Station, Tamil Nadu Agricultural University, Coimbatore, for a period of twelve months from August 1985 to July 1986. The light trap was operated for 12 hr from 6 pm to 6 am and daily catch as recorded in the

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following morning. The hopper population of both sexes of *N.virescens* and *N.nigropictus* attracted to light trap was recorded individually.

Interrelationship between the population of GLH attracted to the light trap and weather factors with respect to corresponding week and a fortnight prior to the catch was worked out through multiple regression analysis. The weather factors that prevailed during the previous 15 days of catch were also taken into account for this study as the developmental period of nymphs was reported to be 15 days (Anilkumar, 1983). The influence of weather factors on GLH population was worked out for rice seasons of Coimbatore viz., kar (May-June to August – September), samba (August to December – January), late samba (September – October to March – April) and Navarai (December – January to April – May). The weather parameters considered were mean maximum temperature (^{0} C) (X1), mean minimum temperature (^{0} C) (X2), mean morning relative humidity (%) (X3), total rainfall (mm) (X4) and mean sunshine hours (hr) (X5).

RESULTS AND DISCUSSION

Peak attraction was observed during November, 1985 followed by December 1985 and later on it declined.Light trap catches were significantly high during September, November and December months for *N. virescens* and *N. nigropictus*, individually as well as for the total population of both the species. For *N. nigropictus,* significantly high catches were recorded during October as well. Composition of GLH attracted to light trap also showed that the population of *N.virescens* was dominant and stable over *N. nigropictus* population (Table 1). The multiple regression equations fitted for Nephotettix spp.in total and for *N. virescens* and *N.nigropictus* individually with respect to corresponding week's weather factors and a fortnight prior (Table 2) indicated that weather factors corresponding to the period of catch significantly influenced both the species viz.,*N. virescens* and *N. nigropictus*, individually and collectively. The weather factors that prevailed during the developmental period a fortnight prior to the catch had influenced significantly *N. nigropictus* alone. Considering the contribution by individual weather factors on the total population of GLH on the two species, corresponding week's total rainfall alone showed a significant positive influence. Reddy *et al.* (1983) also reported a significant positive effect of rainfall on the populations of *Nephotettix* spp. Morning relative humidity that prevailed a fortnight prior to catch was found to be a positively influencing factor on N. virescens and *N. nigropictus* which had not been reflected in the total population of *Nephotettix* spp. (Table 2). This result is in agreement with the report of Chelliah and Murugesan (1985).

Among different seasons (Table 3) the influence of weather factors corresponding to the period of attraction of GLH population was found to be significant only for kar season. Weather factors a fortnight prior to catch influenced the GLH population during late samba and navarai seasons. During samba season the influence of weather factors during the corresponding week and a fortnight prior to catch was not significant. A complete positive significant association of total rainfall was observed on the GLH population attracted during the corresponding week for kar season. For late samba and

Table 2. Regression co-efficient of weather factors for green leafhopper occurrence (August 1985 - July 1986)

n=48

Particulars Total No./Week	Mean of Weather factors	Regression equation	R_2
Nephotettix sp.	C'	$\hat{Y} = 1489.0595 - 38.7371\ X_1 - 5.6505\ X_2 - 3.0227\ X_3 + 8.1773^{**}\ X_4 + 29.6190\ X_5$	0.2529 *
	F'	$\hat{Y} = 304.1327 - 41.4638\ X_1 + 34.1466\ X_2 + 5.6910\ X_3 + 1.5009\ X_4 - 4.3273\ X_5$	0.1892 NS
N. virescens	C'	$\hat{Y} = -715.0613 - 21.8388\ X_1 + 1.9321\ X_2 + 15.8206\ X_3 + 5.5195^{**}\ X_4 + 12.0476\ X_5$	0.2976 **
	F'	$\hat{Y} = -896.6327 - 21.4357\ X_1 + 19.0301\ X_2 + 15.4331^{*}\ X_3 + 1.3245\ X_4 - 8.6178\ X_5$	0.1979 NS
N. nigropictus	C'	$\hat{Y} = 358.8896 - 11.5517\ X_1 - 1.3667\ X_2 - 0.0341\ X_3 + 1.6362^{*}\ X_4 + 8.0108\ X_5$	0.2411 *
	F'	$\hat{Y} = -367.8884 - 8.8492\ X_1 + 6.2399\ X_2 + 6.4645^{*}\ X_3 + 0.7081\ X_4 - 3.1316\ X_5$	0.3149 **

C' : Corresponding week; F' = A fortnight prior

** : Highly significant; * = Significant; NS : Not significant.

Table 3. Regression co-efficient of weather factors for **Nephotettix** spp. during different seasons

Season	Mean of Weather factors	Regression equation	R_2
Kar (n=20)	C'	$\hat{Y} = 1777.8481 + 1.7532\ X_1 - 82.6117\ X_2 - 1.7136\ X_3 + 6.4892^{**}\ X_4 + 21.2658\ X_5$	0.5755 *
Late samba (n=32)	F'	$\hat{Y} = -80.0103 - 22.4028\ X_1 + 36.53\ X_2 + 10.2326\ X_3 - 1.1439\ X_4 - 80.8828\ X_5$	0.3553 *
Navarai (n=24)	F'	$\hat{Y} = -1067.2572 - 8.5972\ X_1 + 30.0206\ X_2 - 14.1767\ X_3 - 4.2917\ X_4 - 41.7465\ X_5$	0.5061 *

$\hat{Y}$ = Total number of GLH/week was the dependent variable

C' : Corresponding week

F' : A fortnight prior ; ** : Highly significant ; * : Significant.

navarai seasons, the influence of weather factors a fortnight prior to catch was alone significant and not during the corresponding week. A fortnight prior to catch, none of the individual weather factors that existed during late samba and navarai seasons influenced the GLH population.

From light trap catches it was interesting to note that the peak occurrence concided with the second and third crop seasons (samba and late samba). Higher catches were recorded from one month after transplanting of samba crop (from September onwards) where as it coincided right from the beginning with the late samba season (September/October). During navarai season declined population was noticed.

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TABLE 1.
composition of GLH species during light trap captures from August 1985 to July 1986

Month & Year		Total hopper (Number)	Composition of hopper species (No) *N. virescens*	*N. nigropictus*
August	1985	187	158 (84.49)	29 (15.51)
September	1985	1139**	927 (81.38)**	212 (18.62)**
October	1985	752	568 (75.53)	184 (24.27)**
November	1985	3043**	2246 (73.80)**	797 (26.20)**
December	1985	1152**	921 (79.94)**	231 (20.06)**
January	1986	448	375 (83.70)	73 (16.30)
February	1986	422	334 (79.14)	88 (20.86)
March	1986	232	209 (90.08)	23 (9.92)
April	1986	280	271 (96.78)	9 (3.22)
May	1986	394	380 (96.44)	14 (3.54)
June	1986	94	89 (94.68)	5 (5.32)
July	1986	105	98 (93.33)	7 (6.67)
Mean		687.33	548.00	139.33
SE		68.82	50.42	18.62
CV		12.00	11.04	16.00

Figures in parentheses are percentage of composition

** Significant at P =0.01

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