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INFLUENCE OF TIME OF SOWINGS AND WEATHER FACTORS ON THE INCIDENCE OF LATE LEAF SPOT OF GROUNDNUT

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ABSTRACT

Late leaf spot of grondnut caused by Cercosporidium personatum is one of the serious diseases in groundnut. Time of sowing trails were conducted for both irrigated and rainfed conditions. The incidence of late leaf spot was high in the sowing taken up on 16-9-85 (rainfed) while minimum incidence was in the sowing on 1-7-85. In the irrigated season, maximum incidence was in the sowing taken up on 16-2-85 while minimum ws in 17-4-86 sowing. In bot seasons, early sowings recorded higher yield of groundut pods. There was negative association with disease intensity and yield parameters like shelling percentage and pod yields. Multiple regression studies with weather factors and late leaf

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spot revealed that the rainfall and relative humidity exerted a positive association with disease incidence while wind velocity had negative correlation.

The late leaf spot (LLS) caused by **Cercosporidium personatum** is a serious disease of groundnut. The infection starts from 30 - 40 th day of sowing and continues nearly upto the harvesting stage. Pod yield loss to an extent of 50 per cent and fodder loss upto 60 per cent are attributed to this disease (Cook, 1981). Ponniah et.al. (1982) recorded yield losses ranging from 35 to 60 percent and 28 to 52 percent respectively during rainfed and irrigated seasons. In recent years, the crop is grown throughout the year. Hence in order to determine the ideal sowing time for realising maximum yield with minimum disease incidence, trails were taken up in reinfed and irrigated seasons at periodical intervals during 1985 and 1986. The influence of weather factors and disease incidence have also been worked out and reported.

MATERIALS AND METHODS

a) **Time of sowing:** The cultivars TMV 7 and Co1 were sown at fortnightly intervals in plots of 4.5 z 3.6 m replicated twice at Oil Seeds Research Station, Tindivanam. During the rainfed season nine sowings were taken up starting from 1-7-1985 to 1-11-1985 at fifteen days interval and during irrigated season another nine sowings were taken up starting from 16-2-1985 to 17-4-1985 at fifteen days intervals. Normal spacing of 30 cm between rows and 10 cm between plants were adopted LLS incidence was recorded starting from 30 DAS to 90 DAS for each sowing and scored on a 1-9 scale worked out by Subramanyam et al., (1982).

b) **Weather factors:** All the data except the evening relative humidity was recorded 0710 hr. The evening relative humidity was recorded at 14.10 hr.

At harvest, cleaned dry pod yield, 100 pod weight, shelling percentage, and haulms weight were recorded for each variety and analysed statistically and the results are presented in Table 1 & 2. To understand the influence of weather parameters on LLS incidence, simple and multiple correlation analysis were made using the disease incidence as dependent variable (Y) and each of the weather factor as independent variable (X) as described by Pause and Sukhatme (1957).

RESULTS AND DISCUSSION.

Minimum incidence of 6.5 grade was observed in the sowing taken up on 1-7-1985 in rainfed season. There was corresponding increase in the disease level on the delayed sowing upto 16-9-85. After 1-10-'85 sowing there was a slight decrease in LLS level. Under rainfed conditions the incidence generally increased due to delayed sowing. In the irrigated season, minimum LLS incidence was in 17-4-86 sowing followed by 2-4-86 and 17-3-86. Sowings taken up on 16-1-86 to 2-3-89 recorded much higher LLS incidence while sowing on 16-12-85 and 1-1-86 were more or less equal to 17-3-86 disease level. Under

irrigated conditions the sowings taken up after March 15 showed less of LLS incidence. The observation on different age of the plants indicated that the level of intensity increased with the increase in age of plant in both the seasons irrespective of cultivars sown.

In both rainfed and irrigated sowings, the early sowings (1-7-1985 and 16-12-1985) recorded higher yield

Table 1 : Data on rainfed season 1985 (pooled mean of TMV7 and CO 1 varieties)

Sl. No.	Treatment	Disease incidence	Yield	Shelling %
1	1-7-1985	6.5	926	72.5
2	16-7-1985	6.6	911	72.1
3	1-8-1985	6.7	885	72.1
4	16-8-1985	6.9	861	71.8
5	1-9-1985	6.9	861	71.8
6	16-9-1985	7.1	866	71.5
7	1-10-1985	7.7	741	70.6
8	16-10-1985	7.5	89	70.3
9	1-11-1985	7.3	548	70.6

Table 2 : Date on irrigated season 1986 (pooled mean of TMV 7 and Co 1 varieties)

Sl. No.	Treatment	Disease incidence	Yield kg/ha	Shelling %
1	16-12-1985	6.9	1289	72.6
2	1-1-1986	6.6	1241	72.6
3	16-1-1986	7.5	1220	72.1
4	1-2-1986	7.7	1200	71.9
5	16-2-1986	8.1	1169	70.6
6	2-3-1986	7.2	1138	71.7
7	17-3-1986	6.5	1106	71.9
8	2-4-1986	5.9	988	71.5
9	17-4-1986	5.3	848	71.7

Table 3 : Effect of disease intensity on yield and yield parameters during irrigated season 1986

Sl. No.	Variable	Correlation Co-efficient	Regression	Significant level
1	Disease VS yield	Y = 1827.93-99	0.70	X
2	Shelling percentage VS disease	Y = 73.2-20X	0.33	NS
3	Disease VS haulms yield	Y = 15.3-95X	0.982	XX

Note : X Significant at 0.05 percent level

XX Significant at 0.01 percent level

NS Not significant

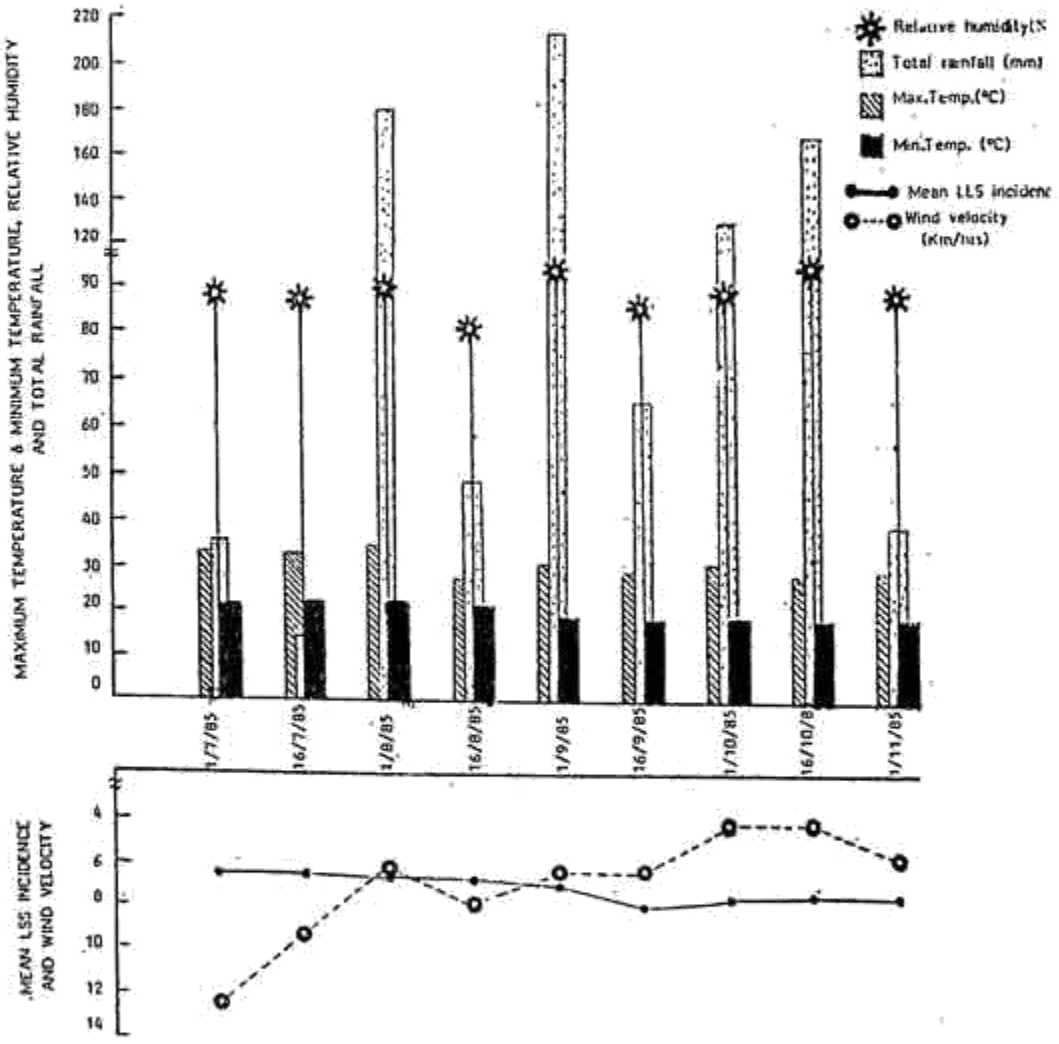
than the rest of the sowings. A parallel trend was observed in shelling percentage also in both the seasons. The influence of LLS incidence on shelling percentage showed a negative association (Y = 78.93 - 1.6x; r - 0.96; h = 9). An increase of 1.6 grade in disease level would result in a decrease of one percent shelling outturn (Table 3; Fig. 1).

Rainfall exerted a positive correlation with disease incidence under rainfed conditions. Results of pooled multiple regression in both seasons showed that the LLS incidence also exerted a positive association with relative humidity and negative association with wind velocity. (YA = 7.02 - 0.12 x 1, NS0.294 x 2 NS + 0.077 x 3 + 0.282 x 4 x 03 x 5 NS). The result revealed that an increase of 1.1 per cent relative humidity would lead to an increase of 0.03 grade of LLS incidence (Fig.1).

Jenson and Boyle (1965) correlated the increase of peanut leaf spot severity with period of relative humidity. Johnson et.al; (1986) worked out Cercospora leaf spot management through correlation between rainfall and disease severity. The present study also showed that the rainfall and relative humidity had a positive correlation while minimum temperature had negative association with disease incidence.

In both rainfed and irrigated seasons there was significant negative correlation with wind velocity. The effect of wind velocity in the reduction of late leaf spot incidence may be due to removal of inoculum from the host plants and dispersal to long distance.

Fig 1 : EFFECT OF WEATHER FACTORS ON LATE LEAF SPOT INCIDENCE (Rainfed season)



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RESEARCH NOTES

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LINKAGE ESTIMATES BETWEEN GENES FOR TOLERANCE OF IRON CHLOROSIS AND PLANT HEIGHT IN RICE (Oryza Sativa L.)

Genotypic differences do exist in rice (**Oryza Sativa L**) for reaction to tolerance of iron chlorosis under irrigated upland rice conditions of Marathwada in Maharashtra (Misal and Nerkar, 1983) where the soils are calcareous (vertisols), highly alkaline (pH 8.2 to 9.2) in reaction and are readily prone to severe iron chlorosis. The modern high yielding semidwarf varieties possessing Dee-Gee-Woo-Gen gene are sensitive to iron chlorosis. The local tall cultivars though tolerant of iron chlorosis are lodging, non-responsive to high doses of nitrogen and are low yielding (Nerkar, 1980). No report is available on the inheritance of tolerance of iron chlorosis and plant height and the relationship between these two traits in rice. An investigation was undertaken with the objective of understanding the inheritance patterns and relationships between the said two traits. This study revealed that in two crosses. i.e., Prabavathi x RPA 592 and Prabhavati x Basmati 370 the parents showed monogenic differences for both tolerance of iron chlorosis as well as plant height, which forms the materials for the present study. Therefore, a need was felt to estimate the extent of linkage between these two genes so as to plan a successful breeding programme to incorporate both tolerance of iron chlorosis and the desired plant height in rice in the areas where the soils exhibit severe iron deficiency symptoms.