

GROUNDNUT GENOTYPES WITH MULTIPLE RESISTANCE TO FOLIAR DISEASES

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ABSTRACT

For late leaf spot, rust disease and Alternariosis disease the genotypes PI 259747, PI 405132, PI 215696, NCAC 17132, NCAC 17135 and NCAC 17133, RF were found to be resistant. Among progenies of crosses between FESR and POL 2 screened for nine generations, two cultures viz., VG 80 and VG 81 have high yield potential also besides having resistance to rust and tolerance to late spot.

KEY WORDS : Groundnut, Disease Resistance, Screening

In groundnut late leaf spot and rust diseases are the major foliar diseases causing severe losses in groundnut production. Combined infection of both diseases result in quick defoliation and heavy loss in yield (Subrahmanyam *et al.*, 1980). A new leaf spot disease caused by *Alternaria alternate* Fr. Keissler has also been reported (Muthusamy, 1985). Screening of cultures against the individual diseases has been reported by many earlier workers. In the present investigation attempts have been made to identify the cultures possessing multiple resistance.

MATERIALS AND METHODS

Screening of groundnut genotypes from different sources was taken up by following infector row technique both under rained and irrigated conditions at Regional Research Station, Vridhachalam for three years from 1982 to 1985. The cultivars TMV 2 and CO 1 were used as susceptible checks for all the three diseases. To initiate rust and late leaf spot, the disease induced potted plants were kept in the field and inoculum of spores was sprayed in the evening hours on 45th day after sowing. Rating of diseases was

done following 1-9 scale on 90th day. The crossed rust resistant progenies were forwarded to next generation on the basis of their resistance and yield (Muthusamy *et al.*, 1983). At F8 generation the yield was assessed under replicated trials. The yield trial was also conducted in comparison with fungicidal spray and analysed statistically and presented.

RESULTS AND DISCUSSION

From the year 1982 onwards, 73 cultures were screened both under rained and irrigated conditions. The rust disease was maximum under irrigated condition from December to March and late spot was severe during rained condition from July to September. The *Alternaria* leaf spot was observed only from December to March. From the observations for six seasons it was found that the genotypes PI 259747, PI 215697, NCAC 101132, NCAC 17135, NCAC 17133 RF were found to be resistant for all the three foliar diseases of groundnut (Table 1). The resistance of these genotypes of late leaf spot and rust was also reported earlier by Subrahmanyam *et al.*, (1980). Virginia groups were not affected by *Alternaria* leaf spot, whereas all other

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Table 1. Reaction of groundnut genotypes to tikka, rust and alternaria

Name of entry	Reaction		
	Rust	Tikka	Alternaria
PI 25974	2	3	0
PI 405132	2	3	0
PI 215696	1	3	2
NCAC 17132	2	2	0
NCAC 17135	2	2	0
NCAC 17133 RF	2	2	0
CO 1	8	9	5
TMV 2	8	9	5

Spanish bunch groups were found to be susceptible (Table 2). Most of the rust and late leaf spot resistant lines are unadopted and have undesirable pod and seed characters (Muthusamy, 1985).

From the single plant selection of FESR lines, three plant types, FESR 5-11, 11-4 and 11-6 were identified as immune to rust at

Table 2. Reaction of groundnut genotypes to *Alternaria*

Name of variety	Disease reaction	Type
TMV 1	0	Virginia
TMV 4	0	"
TMV 10	0	"
Rubut 33-1	0	"
VG 5	0	"
CO 1	5	Spanish bunch
TMV 2	5	"
TMV 7	5	"
TMV 9	5	"
JU 24	5	"

Coimbatore (Vidhyasekaran *et al.*, 1983). These were crossed with POL 2 and the progenies were developed and segregation to rust disease was observed upto F6 generation (Muthusamy, 1985). At F8 generation the resistant lines were tested for their agronomic characters in comparison with local cultivars. From these, two cultures *viz.*, VG 80 and VG 81 possessing high yield were

Table 3. Disease reaction and yield characters of rust resistant types

Name of varieties	Disease tikka	Score rust	Dry pod weight (Kg/ha)	Shelling (%)
VG 80	4.78	2.68	3250	76
VG 81	4.35	2.65	3225	77
VG 77	6.30	2.63	2975	74
CO 2	6.13	5.85	2925	74
JL 24 (P)	4.68	4.40	3175	73
JL 24 (UP)	6.75	7.10	2750	68
CD at 5% level	0.29	0.24	546	

80 and VG 81 possessing high yield were compared with released cultivars. They were also compared with fungicide sprayed variety JL 24. Except CO 2 all the cultivars were statistically on par in yield. The yield potentials of VG 80 and VG 81 were similar to JL 24 when the disease was controlled (Table 3). The spraying cost of Rs.690 could be easily saved by growing these resistant cultures.

These cultures are also less susceptible to late leaf spot and possessed higher shelling percentage and similar oil content of other cultivars. Till harvest the resistant cultivars

were green without defoliation which may be better utilized as fodder for cattle.

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POST INFECTIONAL CHANGES IN GROUNDNUT LEAVES INDUCED BY GROUNDNUT BLIGHT PATHOGEN

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ABSTRACT

Post-infectional change in contents of total carbohydrate, total nitrogen, total phenolics, nucleic acids and chlorophyll fractions in the leaves of three groundnut genotypes with varying levels of resistance to blight caused by *Phoma microspora* Balasubrm. *et* Narayan., was studied. Total carbohydrate contents of the resistant variety, Ah 8446 and the tolerant variety, POL 2 showed only a marginal variation, while the highly susceptible OSN 2 registered significant increases. There was no appreciable change in total nitrogen content in the resistant variety consequent on inoculation. Increase in the total phenolics contents was significantly greater in the highly susceptible OSN 2 than others. There was no significant alteration in the contents of RNA and DNA in the resistant and tolerant varieties while reduction in the contents of chlorophyll was maximum in the highly susceptible variety.

KEYWORDS : Groundnut blight, Resistance mechanism.

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