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BY

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Till 1987 the research activities were restricted to mostly foliar diseases particularly leaf spot diseases caused by Cercospora arachidicola and Phaeoisariopsis Duringata. 1988 crop season some work on diseases caused due to soil and seed borne pathogens was initiated. This included resistance screening and chemical control against seed rots and seedling diseases caused by soil fungi especially Aspergillus niger, Macrophomina phaseolina, Aspergillus flavus and Rhizopus sp.

In these experiments were conducted at Nioro which is a hot spot for leaf spot diseases. This year also there was heavy disease pressure particularly of early leaf spot, (Cercospora arachidicola) in both resistance screening and chemical control experiments. The results of all these experiments are discussed in the following pages.

I - RESISTANCE SCREENING AGAINST LEAF SPOT DISEASES :

1.1 - Screening germplasm entries :

Out of 252 germplasm entries tested against leaf spot diseases under natural infection at Nioro, 100 entries had shown low infection. Of these, 94 entries were retested during 1988 season alongwith some known susceptible checks and 2 new entries received from ICRISAT.
Thus total 100 entriez were sown on 30-07-88 in a single row of 6 m length The spacing followed was 60 cm between rows and 15 cm within plants.
One seed was sown at each pocket. All entries were sown in 3 replications.

Early leaf spot symptoms started appearing in the third week of August, In the begining the symptoms were seen on few highly susceptible varieties but soon they were spread to all the entries. Heavy rainfall in August helped to spread the disease rapidly. Heavy disease pressure was developed at the time of maturity.

Observations were recorded twice (16.09 and 16..LO .88) on the leaf spot infection. A scale of 0- 10 proposed by ICRISAT, where 0 stands for no infection and 10 denotes 100 % leaf area affected by leaf spot infection was used for recording the observations. Mean disease score for each entry is furnished in table 1.

Table 1 : Mean leaf spot score of some gersplasm entries

Sr. No	Entry	Leari Score	
		1st obs on 16/09	2nd obs on 7/11
1	2	3	
1	56-311	1.5	
2	53-66	2.5	.A
3	53-86	2.5	
4	48-111	1.5	
5	55-233	2	5
6	48-38	1.5	
7	48-44	2.5	
8	48-154	1.5	
9	59-143	2.5	6
10	42-44	3.5	
11	55-131	3	A
12	57-67	4	NA
13	59-238	3	7
14	28-224	3	7
15	48-38 A	2.5	NA
16	48-101	3	
17	56-222	3.5	
18	56-233	1.5	NA
19	56-295	2.5	
20	56-370	2.5	
21	56-375	1	NA
22	56-379	2	7
23	56-423	3	
24	58-19	1.5	6
25	58-52	2.5	8
26	58-351	2.5	NA
27	59-105	3.5	NA
28	59-123	3	6
29	59-243	3	7
30	75-104	3.5	6
31	58-173	2.5	7
32	58-453	3	8
33	58-650	3	NA

	2	3	4
34	59-258	3	7
35	61-92	3.5	6
36	48-151	3	NA
37	48-108	3.5	6.5
38	56-176	3	7
39	56-242	2.5	6
40	56-293	2	5.5
41	58-68	2	6.5
42	59-145	3.5	7
43	59-390	3	7
44	68-112	3	6.5
45	53-300	3.5	7.5
46	59-155	3.5	7
47	J 11	4	9
48	59-266	3.5	NA
49	48-55	3	NA
50	GH 119-20	3.5	8
51	50-36	2	6.5
52	52-2	3	8
53	53-68	2.5	6
54	55-214	2.5	7
55	55H46E17	3	7.5
56	56-286	2.5	5.5
57	56-326	3	5
58	56-383	2.5	6
59	56-447	2.5	7
60	58-45	3	8
61	58-53	3	7
62	58-138	2	7
63	58-160	3	7
64	58-167	3.5	5.5
65	58-399	3	7
66	58-408	2.5	7.5
67	59-68	4	7
68	59-118	3	7
69	59-125	2.5	NA
70	59-148	3	7
71	59-151	3	6
72	59-502	2.5	NA

1	2	3	
73	61-9	3.5	6
74	73-33		NA
75	73-3	3:	7
76	75-72		NA
77	75-84	2	6
78	PR 64 S	3.5	NA
79	Sénégal Oriental	2.7	NA
80	v-773	4.5	7
81	V-781	3	7
82	59-298	3	7
83	55-51.1.	2.5	7
84	57-102	4	NA
85	57-319	4	7
86	58-147	4	7.5
87	58-157	3	7.5
88	59-147	3	7
89	59-260	3	7.5
90	U 4-47-7	4.;	9
91	28-210 A	2.5	6
92	48-62	3	5.5
93	56-188		5.5
94	58-18	3	6
95	58-31		6
96	58-54		6.5
97	58-682	3	7.5
98	59-92	4	5.5
99	59-130	3	6
100	55-437	6	9

Note : NA - Result not available

It is seen from the results presented in table I that no variety is free or resistant to leaf spot diseases. Majority of the entries are either moderately susceptible or susceptible. The distribution of germplasm entries amongst various intensity grades was as under.

Grade	N° of entries	Grade	N° of entries
4	1	5	4
5.5	6	6	21
6.5	5	7	29
7.5	7	8	
9	3		

Five varieties have shown low leaf spot infection which can be rated as moderately resistant or tolerant. All these varieties have been screened continuously for last 3 years and they have consistantly shown low leaf spot, infection. It is, therefore, suggested to use these varieties in the crossing program for incorporating the field resistance to leaf spot, diseases in the locally cultivated varieties which are highly susceptible. The performance of these varieties against leaf spot diseases during last 3 years was as under.

Entry	Disease Score		
	1988 (Nioro	1987 Nioro)	1986 (Bambey)
48-154		4	2
56-311	5	3.5	1
48-44	5	4	2
56-295	5	4.5	1
56-326	5	5	1

II - CHEMICAL CONTROL OF' LEAF SPOT DISEASES

The experiment on chemical control of leaf spot, diseases was initiated in 1986 at Bambey on 73-33 variety with 4 chemicals. in 1987, the experiment was shifted to Nioro as it is a hotpot for leaf spot diseases of' groundnut, where it was conducted on 3 varieties VIZ, 73-33 and 73-30. During 1988 season the experiment was continued at Nioro with addition of one more Chemical VIZ.

Sumi 8. Sumi 8 is new triazole fungicide manufactured by Sumitom Chemical Co-Ltd,Japan. It has been reported to be highly effective against leaf spot diseases in the United States. It was used in two doses VIZ. 50 g ai/ha and 100 g ai/ha. Other experimental details were as under.

Experimental Design : Split plot

Location : Nioro

Varieties : 2 VIZ., 1) 73-33
2) 73-30

Treatments : 8 VIZ.,

1)	Benomyl(Benlate)	200 g ai/ha
2)	Benomyl (Benlate)	100 g ai/ha
3)	Mancozeb(Mancozan Blue)	1 500 g ai/ha
4)	Copper + ineb(Calimix)	400 g pc/100 l.
5)	Maneb	160 g ai/100 l
6)	Diniconazole (Sumi 8)	50 g ai/ha
7)	Diniconazole (Sumi 8)	100 g ai/ha
8)	Absolute control	

Replications : 4

Plot size : 3.5 x 4.5 m^2 gross ; 3.5 x 3.9 m^2 net

Spacing : 50 x 15 cm

Fertilizers : 6-20-10 at the rate of 150 kg/ha as basal dose.

Date of sowing : 15-07-88

Date of harvest : 3-11-88

The fungicidal treatments were started after the appearance of the leaf spots. The leaf spots had started appearing in the second week of August. In all 4 fungicidal sprays were given on 17.08, 5.09, 16.09 and 28.09.88. observations on leaf spot score were recorded at the time of each fungicidal spray. Final observations were recorded on the leaf spot severity based on the leaf area damaged. The summary of results for the final disease score recorded on 28.09.88 is presented in table 2 while that of the disease severity and yield data are presented in tables 3 and 4 respectively. The results for both the disease severity and the yield are depicted simultaneously in a graph on page 10.

Table 2 : Chemical control of leaf spots
Summary of results of final disease score

Variety / Fungicide		73-33	13-30	Mean
Benomyl	200 g ai/ha	3.25	3.50	3.375
Benomyl	100 g ai/ha	3.75	4.50	4.125
Mancozeb	1500 g ai/ha	4.25	4.75	4.500
Calimix	400 g pc/100 l	4.75	5.75	5.250
Maneb	160 g ai/100 l	4.50	5.25	4.875
Sumi 8	50 g ai/ha	4.50	ii.00	4.253
Sumi 8	100 g ai/ha	3.75	3.75	3.750
Control		6.00	5.75	5.875
	Mean	21.344	4.656	

Coefficient of variation (1) : 16.01% Coefficient of variation (2') : 22.22%

Probability for fungicide : .000 LSD for fungicide : .971 at 1%

Probability for variety : .015

Probability for interaction : .391

Results of Duncan's Multiple Range Test :

Benomyl	200 g a i /ha	E
Benomyl	100 g a i/ha	CDE
Mancozeb	1.500 g a i/ha	BCD
Calimix	400 g pc/100 1.	AB
Maneb	160 g ai/100 l	ABC
Sumi 8	50 g ai/ha	BCDE
Sumi 8	100 g ai /ha	DE
Control		A

Treatments with the same Letters io not differ signi ficantly.

Table 3 : Chemical control of leaf spots

Summary of results of disease severity

(Figures in the brackets denote arcsin value:;:

Variety / Fungicide		73-35	73-30	Mean
Benomyl	200 g ai/ha	62.160 52.068	63.720 (53.055)	62.943 (52.561)
Benomyl	100 g ai/ha	71.995 58.257	75.375 (60.730)	73.685 (59.404)
Mancozeb	1500 g ai/ha	76.700 61.265	84.350 (67.453)	80.525 (64.359)
Calimix	400 g pc/100 l	93.095 (76.028)	93.165 (76.475)	93.130 (76.251)
Maneb	160 g ai/100 l	87.540 69.783)	88.440 (70.255)	87.990 (70.019)
Sumi 8	50 g ai/ha	80.770 64.220)	84.320 (66.785)	82.545 (65.502)
Sumi 8	100 ai/ha	72.470 58.838)	71.555 (57.807)	72.[illegible] (58.322)
Control		95.190 77.988)	94.605 (77.300)	94.897 (77.644)
	Mean	79.991 64.806)	81.441 (66.233)	

Coefficient of variation (1) : 6.64 % (6.39 %)

Coeffic ent of variation (2) : 16.9[illegible] % (15.22%)

Probability for furigi cide : .00[illegible]

LSD for fungicide : 7.25 at 1%.

Results of Duncan's Multiple Range Test :

Benomyl	200	g	ai/ha	E
Benomyl	100	g	ai/ha	CD
Mancozeb	1500	g	ai/ha	BC
Calimix	400	g	pc/100 l	A
Maneb	160	g	ai/100 l	AB
Sumi 8	50	g	ai/ha	B
Sumi 8	100	g	ai/ha	D
Control				A

Treatments with the same letters do not differ significantly

Table 4 : Chemical control of leaf spots

Summary of results of yield data

(Figures in kg/ha)

variety / Fungicide			73-33	73-30	Mean
Benomyl	100	g ai/ha	2705	2077	2391
Benomyl	200	g ai/ha	2385	2192	2288
Mancozeb	1500	g ai/ha	1961	1564	1763
Calimix	400	g pc/100 l	1564	1305	1435
Maneb	160	g ai/100 l	1641	1436	1538
Sumi 8	50	g ai/ha	1576	1744	1661
Sumi 8	100	g ai/ha	1763	1738	1750
Control			1218	1243	1231
	Mean		1854	1659	

Coefficient of variation (1) : 21.08 %

Coefficient of variation (2) : 32.29 %.

Probability for fungicide : .000

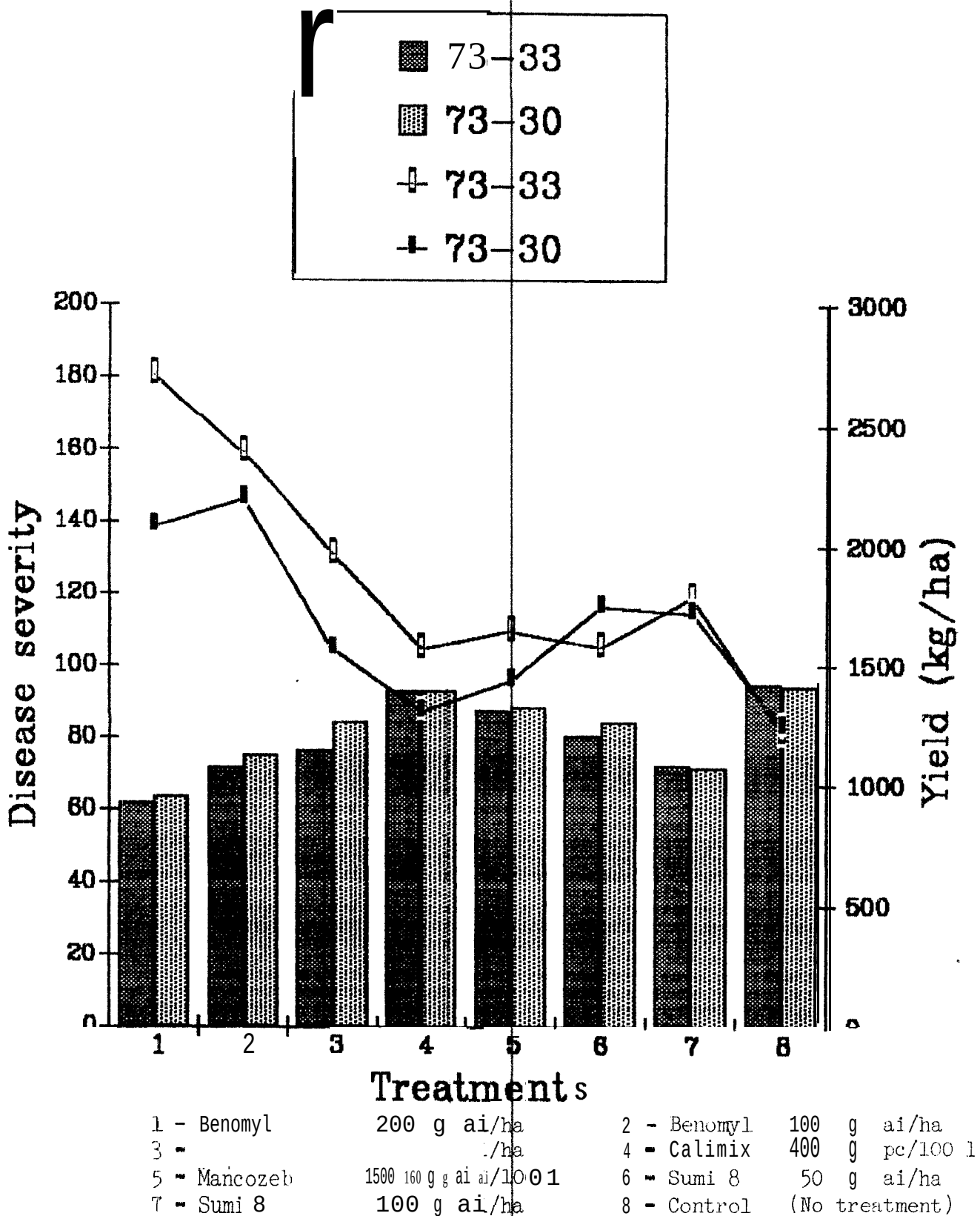
LSD for fungicide [illegible] at 1%.

Results of Duncan's Multiple Range Test :

			1 %	5 %
Benomyl	100	g ai. /ha	A	A
Benomyl	200	g ai/ha	A	A
Mancozeb	1500	g ai/ha	B	B
Calimix	400	g pc/100 1.	B	BC
Plane b	160	g ai/100 1	B	BC
Sumi 8	50	g ai/ha	B	B
Sumi 8	100	g ai/ha	B	B
Control			B	C

Treatments with the same letters do not differ signi f cantly.

Chemical control of leafspots.



1 - Benomyl 200 g ai/ha
2 - Benomyl 100 g ai/ha
3 - ./ha
4 - Calimix 400 g pc/100 l
5 - Mancozeb 1500 160 g g ai ai/1001
6 - Sumi 8 50 g ai/ha
7 - Sumi 8 100 g ai/ha
8 - Control (No treatment)

It is seen from the results in table 2 that the differences in treatment means were highly significant. Three fungicides viz., Benomyl, Mancozeb and Sumi 8 were highly effective in reducing the leaf spot score. Benomyl at 200 g dose exhibited the lowest leaf spot score followed by Sumi 8 at 100 g dose. Both these treatments were significantly effective over control as well as Calimix and Maneb in reducing the leaf spot score while they were on par with Benomyl at 100 g dose, Sumi 8 at 50 g dose and Mancozeb.

The mean leaf spot score of two varieties differed significantly. 73-30 had more leaf spot score than 73-33. In 1987 season the difference between the mean leaf spot score of these varieties was non significant. The interaction between the varieties and the fungicides was observed to be non significant as was observed in 1987 season indicating that the fungicides had the same effect on both the varieties.

The results in table 3 revealed that the differences in mean disease severity of various treatments were highly significant. All the fungicides were highly effective in reducing the disease severity except Calimix and Maneb. Benomyl at 200 g dose was the most effective treatment followed by Sumi 8 at 100 g dose. However, the later was on par with Benomyl at 100 g dose.

The disease severity of two varieties did not differ significantly. The final disease score recorded at the time of last fungicidal treatment ie, on 28-09-88 showed that 73-30 had significantly more disease score than 73-33. However, the disease level of the two varieties did not differ significantly in the disease severity observations which were recorded one month later. This observation agrees with the result obtained during 1987 season and confirms that both the varieties are equally susceptible to leaf spot diseases. This also confirms the earlier observation noted in 1986 that the early varieties show more infection in the beginning but subsequently the late varieties also develop similar infection.

As in case of disease score, the interaction in between the fungicides and the varieties was non significant in respect of disease severity also. This confirms the eorlier results of 1987 season as well as the disease score data of this year's experiment that the fungicides have the same effect on both the varieties, or in other words, both the varieties have responded similarly against all the fungicides.

The yield differences amongst various treatments were observed to be highly significant. Same trend of results was obtained in 1987 also. Benomyl at 200 g dose had given the highest yield which was significantly more than all other treatments except Benomyl at 100 g dose. Last year also Benomyl at 200 g dose had given the highest yield which was significantly more than all other treatments indluding Benomyl at 100 g dose. When the fungicides were compared by the Duncan's Multiple Range Test at 5%, level, three more treatments VIZ., Mancozeb at 1500 g ai/ha and Sumi 8 both at 100 g and 50 g ai/ha were observed to give significantly more yield than the absolute control.

III - RESISTANCE SCREENING AGAINST SEED ROT AND SEEDLING DISEASES DUE TO SOIL FUNGI

3.1 - Resistance screening against Aspergillus niger :

Seedrots and seedling diseases incited by soil fungi especially Aspergillus niger, Macrophomina phaseolina, Aspergillus Flavus and Rhizopus sp. cause serious reduction in plant stand. Incidence of crown rot/collar rot caused due to A. niger is very often encountered in Senegal throughout the ground nut basin. It is particularly serious in sandy light soils. Hence attempts were made this year to search for sources of resistance to crown rot/collar rot by testing some of the germplasm collections in the field at Nioro.

In all 100 entries were sown on 30.07.88 in a single row of 6 m length. The spacing followed was 60 cm between rows and 15 cm within plants. One seed was sown in each pocket. Furadan was applied before sowing to avoid seed damage due to milipedes. All the entries were sown in 2 replications. One replication was inoculated with the crown rot pathogen which was multiplied in the laboratory on the groundnut shells. Inoculum was added to each pocket alongwith the seed at the time of sowing. Observations recorded for the germination and the collar rot incidence are given in table 5.

Table 5 : Observations on germination and collar rot incidence in the resistance screening trial

	Entry	Germination %		Collar rot incidence %		Reduction in germination due to inoculation %
		RI Inoculated	RII Uninoculated	RI	RII	
	2	3	4	5	6	7
1	56-311	70.00	92.50	2.57	0.30	22.50
2	53-66	50.00	72.50	0.00	0.00	22.50
3	53-86	70.00	92.50	0.00	0.00	22.50
4	48-111	57.50	70.00	0.00	0.00	12.50
5	55-233	02.50	97.50	0.00	0.00	35.00
6	48-38	35.00	62.50	0.00	0.00	27.50
7	48-44	42.50	60.00	5.88	8.33	17.50
8	48-154	7.50	5.56*	0.00	0.00	
9	59-143	57.50	90.00	4.35	0.00	32.50
10	42-44	52.50	72.50	0.00	0.00	20.00
11	55-131	67.50	90.00	0.00	0.00	32.50
12	57-67	67.50	77.50	0.00	0.00	10.00
13	59-238	75.00	92.50	0.00	0.00	17.50
14	28-224	75.00	100.00	0.00	0.00	25.00
15	48-38 A	57.50	87.50	0.00	0.00	30.00
16	48-101	70.00	72.50	0.00	0.00	2.50
17	56-222	50.00	90.00	0.00	0.00	40.00
18	56-233	35.00	47.50	0.00	0.00	12.50
19	56-295	35.00	37.50	0.00	0.00	2.50
20	56-370	67.50	77.50	0.00	0.00	10.00
21	56-375	42.50	0.00 *	0.00	0.00	
22	56-379	50.00	80.00	0.00	0.00	30.00
23	56-423	67.50	82.50	0.00	9.00	14.50
24	58-19	70.00	90.00	0.00	3.00	20.00
25	58-52	47.50	87.50	0.00	0.00	40.00
26	58-351	20.00	62.50	0.00	0.00	42.50
27	59-105	47.50	72.50	0.00	0.00	25.00
28	59-123	45.00	65.00	0.00	3.00	20.00
29	59-243	45.00	85.00	0.00	0.00	40.00
30	75-104	7.50	57.50	0.00	4.35	50.00
31	58-173	22.50	50.00	0.00	0.00	27.50

.../...

	2		4	5	6	
32	58-453	65,00	85.00	0.00	0.00	30.00
33	58-650	30,00	72.50	0.00	0.00	42.50
34	59-258	57.50	67,50	0.00	0.00	10.00
35	61-92	17.50	77.50	0.00	0.00	60.00
36	48-151	77.50	95.00	0.00	0.00	17.50
37	48-108	52.50	87.50	0.00	0.00	35.00
38	56-176	85.00	97.50	0.00	0.00	12.50
39	56-242	22.50	47.50	0.00	0.00	25.00
40	56-293	47.50	72.50	0.00	0.00	25.00
41	58-68	72.50	92.50	0.00	2.70	20.00
42	59-145	70.00	72.50	0.00	0.00	2.50
43	59-390	32.50	75.00	0.00	0.00	42.50
44	68-112	45.00	85.00	0.00	0.00	40.00
45	53-300	47.50	75.00	0.00	0.00	27.50
46	59-155	25.00	70.00	0.00	0.00	45.00
47	[illegible]	75.00	85.00	3.33	0.00	10.oc
48	59-266	45.OC	72.50	0.00	0.00	27.$0
49	48-55	30.00	80.00	0.00	0.00	50.00
50	GH 119-20	12.50	62.50	0.00	0.00	50.00
51	50-36	2.50	18.18	0.00	0.00	15.68
52	52-2	67.50	100.00	0.00	0.00	32.50
53	53-68	77.50	92.50	0.00	0.00	15.00
54	55-214	62.50	92.50	0.00	0.00	30.00
55	55H46E17	67.50	72.50	0.00	0.00	5.00
56	56-286	67.50	92.50	0.00	0.00	25.00
57	56-326	2.50	72.50	1.00. oc	0.00	70. 00
58	56-383	67.50	100. 00	0.00	0.00	32.50
59	56-447	50.00	85.00	0.00	0.00	35.00
60	58-45	35.00	92.50	0.00	0.00	57.50
61	58-53	67.50	85.00	0 . 00	0.00	17.50
62	58-138	70.00	97.50	0.00	0.00	27.50
63	58-160	22.50	87.50	22.22	0.00	65.OC
64	58-167	15.00	85.00	0.00	0.00	70.00
65	58-399	82-50	82.50	0.00	0.00	0.00
66	58-408	go.00	100.00	0.00	0.00	10.00
67	59-68	40.00	40.00	0.00	0.00	0.00
68	59-118	65.00	92.50	0.00	0.00	27.50
69	59-125	22.50	60.00	0 .00	0.00	37.50

	2	3	4	5	6	7
70	59-148	0.00	52.50		0.00	52.50
71	59-151	50.00	82.50	.00	0.00	32.50
72	59-502	15.00	30.00	.00	0.00	15.00
73	61-99	57.50	92.50	.00	0.00	35.00
74	73-33	85.00	92.50	.00	0.00	7.50
75	73-30	57-50	72-50	4.35	0.00	15,00
76	75-72	42.50	82.50	.00	0.00	40.00
77	75-84	52.50	95.00	.00	0.00	42.50
78	PR64B	27.50	70.00	.00	0.00	42.50
79	Sénegal Orienta	5.00	57.50	.00	0.00	52.50
80	v-773	20.00	70.00	.00	0.00	50.00
81	'J-781	10.00	45.00	.00	0.00	35.00
82	59-298	67.50	90.00	.00	0.00	22.50
83	55-511	72.50	72.50	.00	0.00	0.00
84	57-102	52.50	70.00	.00	0.00	17.50
85	57-319	60.00	82.50	.00	0.00	22.50
86	58-147	72.50	100.00	.00	0.00	27.50
87	58-157	77.50	85.00	.00	0.00	7.50
88	59-147	20.00	75.00	2.50	0.00	55.00
89	59-260	67.50	90.00	.00	0.00	22.50
90	U4-47-7	82.50	83.33	.00	0.00	0.83
91	28-210 A	32.50	55.00	.00	0.00	22.50
92	48-62	32.50	75.00	.00	0.00	42.50
93	56-188	52.50	85.00	.00	0.00	32.50
94	58-18	40.00	72.50	.00	0.00	32.50
95	58-31	22.50	65.00	.00	0.00	42.50
96	58-54	45.00	95.00	.00	0.00	50.00
97	58-682	52.50	70.00	.00	0.00	17.50
98	59-92	7.50	30.00	.00	0.00	22.50
99	59-130	70.00	97.50	.57	0.00	27.50
100	55-437	37.50	80.00	6.67	3.13	42.50

Note : * Few seeds were sown due to shortage.

The results in table 5 revealed that there was significant difference in the germination percentage of inoculated and uninoculated replications. Almost in all the entries the germination percentage was reduced in inoculated replication. (In case of 3 entries VIZ, 48-1[illegible] and 56-375 it was increased. This might have happened because less number of seeds was sown in second replication due to shortage of seed.). This reduction in germination percentage varied considerably from 0 to 70 % amongst the various entries indicating thereby their different level of resistance to A.niger fungus. Three varieties VIZ., 55-511, 58-399 and 59-68 did not show any difference between the germination percentage of inoculated and uninoculated plants. The following 12 varieties have shown the difference of 10% or less. This shows that they also possess resistance to A niger. 1.U4-47-7, 2.48-101, 3.56-295, 4.59-145, 5.5[illegible]46E17, 6.58-157, 7.73-33, 8.57-67, 9.56-370, 10.59-258, 11.J11 and 12.58-408. Two varieties VIZ., U4-47-7 and J 11 which are received from ICRISAT are reported by them to be resistant to A. niger.

The collar rot, incidence was, however, very neglegible in both the replications. In the inoculated repli cation, 10 entries showed collar rot incidence while it was seen only in 4 entries under natural infection. Two entries VIZ., 48-44 and 55-437 have shown collar rot incidence in both the inoculated and uninoculated treaments while the two ICRISAT varieties VIZ U 4-47-7 and J11 did not show any collar rot incidence even under inoculation.

IV - CONTROL OF SEED ROTS AND SEEDLING DISEASES THROUGH SEED TREATMENTS :

In addition to resistance screening, attempts were made to evaluate some of the seed dressers against the soil fungi causing seed rots and seedling diseases. The experiment was conducted at Nioro with 8 seed dressers. Other details of the experiment were as follows :

Experimental Design	:	Split plot
Variety	:	55-437
Seed types	:	2 VIZ. I) Station seed
		II) Farmers' seed
Seed treatments	:	8 VIZ., I) Rizolex 2 g/kg seed
		II) Rizolex 3 g/kg seed
		III) Granox 2 g/kg seed
		IV) Granox 4 g/kg seed
		V) Thiram 3 g/kg seed
		VI) Sumi 8 1 g/kg seed
		VII) Sumi 8 2 g/kg seed
		VIII) Control No treatment)
Replications	:	4
Plot size	:	4.8 x 4.5 m²
Spacing	:	60 x 15 cm
Fertilizers	:	6:20:10 at the rate of 150 kg/ha
Date of sowing	:	30.07.88
Date of Harvest	:	28.10.88

Seed treatment of respective seed dresser was given 2 days before sowing. The percent germination was recorded 2 weeks after sowing. Observations on collar rot incidence were recorded one and half month after sowing (16.09.88). Observations on plant stand were also recorded at the same time. The yield data was recorded after the harvest. The data for percent germination, plant stand and yield were analysed statistically. The summaries of the results for germination, plant stand and the yield are presented in tables 6, 7 and 8 respectively. The observations on seed rots and collar rot incidence are furnished in table 9.

TABLE 6: Control of seed rot,:; and seedling diseases

SUMMARY OF RESULTS FOR GERMINATION DATA
(FIGURES IN THE BRACKETS ARE ARCSIN VALUES)

Seed Type / Fungicide		Station Seed	Farmers' Seed	Mean
Rizolex	2 g	93.542 (75.298)	83.125 (65.775)	88.334 (70.536)
Rizolex	3 g	90.105 (71.720)	80.935 (64.155)	85.520 (67.937)
Granox	2 g	92.710 (74.507)	84.792 (67.128)	88.751 (70.818)
Granox	4 g	92.853 (74.503)	80.208 (63.672)	86.530 (69.087)
Thiram	3 g	91.252 (72.890)	81.458 (64.527)	86.355 (68.709)
Sumi 8	1 g	90.833 (72.462)	81.875 (64.832)	86.354 (68.647)
Sumi 8	2 g	90.625 (72.342)	78.020 (62.033)	84.323 (67.187)
Control		84.065 (66.655)	77.813 (61.977)	80.939 (64.316)
	Mean	90.748 (72.547)	81.028 (64.262)	

Coefficient of variation (1) : 3.15 % (3.19 %) Coefficient of variation (2) : 2.94 % (3.12 %)

Probability for fungicide : .000 LSD for fungicide : 2.278 at 1%

Probabili ty for seed type : .000

Results of Duncan's Multiple Range Test

			1%
Rizolex	2	g	A
Rizolex	3	g	B
Granox	2	g	A
Granox	4	g	AB
Thiram	3	g	AB
Sumi 8	1	g	AB
Sumi 8	2	g	B
Control			C

Treatments with the same letters do not differ significantly.

Table 7 : Control of Seed rots and seedling diseases

SUMMARY OF RESULTS FOR PLANT STAND (%)

(FIGURES IN THE BRACKETS DENOTE ARCSIN VALUES)

Seed Type / Fungicide		Station Seed	Farmers'Seed	Mean
Rizolex	2 g	93.555 (75.372)	83.160 (65.775)	88.358 (70.574)
Rizolex	3 g	90.195 (71.817)	80.325 (63.710)	85.260 (67.764)
Granox	2 g	92.295 74.005)	84.735 (67.087)	88.515 (70.546)
Granox	4 g	92.820 74.488)	79.590 (63.242)	86.205 (68.865)
Thiram	3 g	91.245 72.880)	80.640 (63.907)	85.943 (68.394)
Sumi 8	1 g	91.245 72.900)	81.375 (64.495)	86.310 (68.697)
Sumi 8	2 g	96.825 72.568)	77.070 (61.405)	83.947 (66.986)
Control		83.790 (66.385)	77.070 (61.450)	80.430 (63.918)
	Mean	90.746 72.552)	80.496 (63.884)	

Coefficient of variation (1) : 3.34 % 3.43 %

Coefficient of variation (2) : 2.78 % (2.66 %)

Probability for fungicide : .000

Probability for seed type : .000

LSD for fungicide 3.859 at 1 %.

Results of Duncans' Multiple Range Test

		1 %	5 %
Rizolex	2 g	A	A
Rizolex	3 g	AB	AB
Granox	2 g	A	A
Granox	4 g	AB	AB
Thiram	3 g	AB	AB
Sumi 8	1 g	AB	AB
Sumi 8	2 g	BC	B
Control		C	c

Treatments with the same letters do not differ significantly .

Table 8 : Control of seed rots and seedling diseases

SUMMARY OF RESULTS FOR YIELD

(FIGURES IN KG/HA)

Seed Type / Fungicide			Station Seed	Farmers'Seed	Mean
Rizolex	2	g	1053	1042	1048
Rizolex	3	g	1157	995	1076
Granox	2	g	1146	1065	1106
Granox	4	g	1227	914	1070
Thiram	3	g	1088	1019	1053
Sumi 8	1	g	972	961	966
Sumi 8	2	g	949	891	920
Control			961	949	955
	Mean		1069	980	

Coefficient of variation (1) : 13.38 % Coefficient of variation (2) : 13.10

Probability for fungicide : .087 LSD for fungi cide : N.S.

Probability for seed type : .074 Note : N.S.. - Non significant

Results of Duncan's Multiple Range Test :

			5 %	10 %
Rizolex	2	g	AB	AB
Rizolex	3	g	AB	AR
Granox	2	g	A	A
Granox	4	g	AB	AB
Thiram	3	g	AB	AB
Sumi 8	1	g	AB	HC
Sumi 8	2	g	B	C
Control			AB	HC

Treatments with the same letters do not d i ffer significantly.

Table 0 : Control of seed rots and seedling diseases
Results of seed rot and collar rot incidence

Seed Type / Fungicide			Seed rot % Station Seed	Seed rot % Farmers' Seed	Collar rot % Station Seed	Collar rot % Farmers' Seed	Microflora associated with Seed rot
Rizolex	2	g	[illegible]	1.67	0.00	0.83	Mp, An, ii
Rizolex	3	g	1.25	2.92	0.00	0.83	Mp, Af, B
Granox	2	g	0.83	2.92	0.00	0.42	Mp, B
Granox	4	g	0.00	2.92	0.00	0.00	Mp, Fs, B
Thiram	3	g	0.00	2.50	0.42	0.42	Mp, Af
Sumi 8	1	g	0.42	2.50	0.42	0.03	Mp, Af, B
Sumi 8	2	g	0.42	2.92	0.42	0.00	Mp, Af, B
Control			1.67	3.33	2.08	1.67	Mp, Af, B

Note :

Mp - Macrophomina phaseolina

An - Aspergillus niger

Af - Aspergillus flavus

Fs - Fusarium sp.

B - Bacteria

The results in table 6 revealed that significant differences existed in the germination percentage of the various treatments. All the treatments have given significantly more germination percentage than control (no treatment). Granox and Rizolex both at 2 g dose have given the highest germination percentage which was highly significant over control as well as two other treatments.

The difference in between two seed types was also highly significant. Very high germination percentage was observed in station seed over farmers' seed. However, the interaction amongst various seed treatments and the seed types was non significant.

The results of plant stand data (Table 7) showed the similar trend as that of germination percentage. All the treatments have given significantly more plant stand than control. Similarly the treatments Granox and Rizolex both at 2 g dose have given the highest plant stand which was highly significant over control as well as one more treatment VIZ. Sumi 8 at 2 g dose.

In case of plant stand data also the difference in between two seed types was highly significant. Station seed has given significantly higher plant stand over farmers' seed. However, in this case also the interaction in between the seed treatments and the seed types was non significant. Though the interaction is non significant there is a striking observation in case of Granox treatment. When the Granox dose is increased from 2 g to 4 g ; the germination percentage and plant stand are further improved in case of station seed but in case of farmers' seed, there is decrease in the germination percentage and the plant stand. This shows that not only the seed treatment but also the seed quality is very important to obtain good germination and plant stand.

In spite of a very high variation in different treatments with regards to germination percentage as well as plant stand ; the yield differences were non significant. However, they were approaching the level of significance. When the means were tested at 10 % level of significance, it was found that Granox at 2 g dose gave significantly more yield than control.

The yield differences amongst the two seed types were also non significant. However, as in case of seed treatments in this case also the station seed has given significantly more yield than the farmers' seed when compared at 10 % level of significance.

The yield differences amongst the various treatments were observed to be significant when compared only for the station seed. Granox at 4 g dose gave the highest yield followed by Rizolex at 3 g dose and Granox at 2 g dose. All the three treatments gave significantly more yield over control. However, the yield differences amongst the treatments for farmers' seed were non significant. This shows that if the seed quality is poor, the seed treatment with the fungicide does not help to improve the yield.

Amongst the various micro organisms found associated with the seed rots (table 9), Macrophomina phaseolina was most common and was noticed in all the treatments. The next important pathogen was bacteria which was also encountered in all the treatments except Thiram. Aspergillus flavus was noticed in 5 treatments. Aspergillus niger and Fusarium sp. were associated with the seed rot of one seed in each case. A.niger was encountered in Rizolex 2 g treatment while Fusarium sp. was seen in Granox 4 g treatment.

Collar rot was absent in all the treatments of Rizolex and Gramox in case of station seed while in case of farmers' seed Granox 4 g and Sumi 8 2 g treatments did not show any collar rot incidence.

Few afla root plants (2 in each case) were noticed in farmers' seed in 2 treatments VIZ., Thiram and Sumi 8 1 g.

V - SURREY OF GROUNDNUT DISEASES

During 1988 crop season groundnut leaf spots were most important throughout the groundnut basin, particularly early leaf spot was more serious and wide spread. Late leaf spot was restricted to few locations. Collar rot caused due to Aspergillus niger was second important disease encountered in all the groundnut areas. Peanut clump as usual was very common in the fields around Bombey. This year for the first time few rust pustules were noticed on some entries in the breeding trials at Wambey.