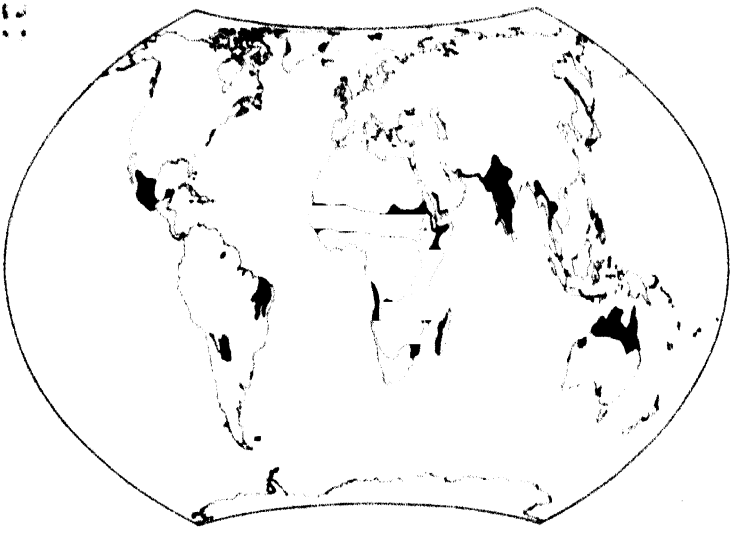
INTERNATIONAL PEARL MILLET DISEASE RESISTANCE TESTING PROGRAM

(IPMDRTP)



REPORT ON THE 1977 PRE-IPMDMN

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1978

INTRODUCTION

The acceptance of the concept of multilocational testing for identification of stable disease resistance led in 1976 to the establishment of the International Pearl Millet Disease Resistance Testing Program containing the International Pearl Millet Downy Mildew Nursery (IPMDMN). In the IPMDMN 40-50 elite resistant materials are tested by cooperators throughout India and West Africa for reactions to the local downy mildew populations. From the results of the 1976 IPMDMN (and other trials) it was obvious that certain locations (particularly some in West Africa) provided much more severe downy mildew (DM) pressure than others. In early 1977, in discussion with several pathologists from other programs, it was decided that a PRE-IPMDMN trial should be established in which a large number of IPMDMN candidate entries are tested at a few key locations. Those succeeding would then go into the IPMDMN in the following year. This seemed to be a sensible approach and so in 1977 we initiated the PRE-IPMDMN program with the cooperation of colleagues at Mysore and Hissar in India and at Kano, Nigeria and Kamboinse, Upper Volta, in West Africa. In the 1977 PRE-IPMDMN we tested 133 millet lines, mainly lines from the ICRISAT millet population improvement program that had done well in the ICRISAT downy mildew nurseries in 1976, and some sister-lines of those already performing well from West Africa.

RESULTS

At Kamboinse part of the trial was washed out and so data for some entries is available in only one replication at this location. At Mysore only one replication was tested. At Kano the plant populations were generally very low and for this reason the Kano data were not included in the analysis.

The infection parameter calculated was DM incidence (%) and the complete data from the four locations are given in Table 1.

The local susceptible indicators had greatest level of downy mildew at Hyderabad, followed by Hissar. However severe DM pressure on the test entries occurred at both Hyderabad and Kamboinse.

One entry, EB 74-75-1, was free from DM at all locations. An additional 21 entries had less than 10% DM in all replications at all locations and a total of 31 entries had less than 15% DM at all locations. The overall entry mean was 12.4% and 80 entries averaged less DM incidence than this (Table 1).

The 32 entries with less than 15% DM at all locations (30 of these had an overall mean of less than 5% DM) are selected for the 1978 IPMDMN.

DISCUSSION

The PRE-IPMDMN program has started well and many potentially useful lines have been identified for further wide-scale testing. In 1978 the PRE-IPMDMN will be evaluated at Kamboinse, Upper Volta, Kano, Nigeria and Hyderabad, India, as data from this trial, the 1977 IPMDMN and breeders trials indicate that these three locations provide greatest DM pressure. Entries will include some new accessions from West Africa, many lines from the ICRISAT breeding program and lines contributed by national programs. Scientists who would like to enter materials into the 1978 and 1979 PRE-IPMDMNs should write to the Cereals Pathologist, ICRISAT, giving details of the material and the quantity of seed available. Material from within India can be included in the 1978 PRE-IPMDMN if received before March 15, 1978.

Table 1. Downy mildew incidence (%) in the 1977 PRE-IPMDMN entries at four locations

Entry	Hissar		Hyderabad		Kamboinse		Mysore	Mean
	Rep 1	Rep 2	Rep 1	Rep 2	Rep 1	Rep 2	Rep 1	
EB 74-75-1	0	0	0	0	0	0	0	0
3/4 Souna 142-1	0	0	0	0	-	0	2.1	0.4
EB 38-1-2	0	0	0	0	-	4.2	-	0.8
3/4 EB 15-2	0	0	4.2	0	-	0	1.4	0.9
EB 90-5-1	0	0	2.1	0	0	4.5	0	0.9
IVS 5216	0	0	4.3	0	0	0	2.5	1.0
SDN 496	0	0	0	0	6.5	0	0	1.1
EB 85-2-1	0	0	2.1	0	0	4.5	0	1.1
MC 5346	0	0	1.7	3.8	-	0	2.9	1.4
MC 6081	5.6	0	0	0	-	3.8	0	1.6
MC 6086	0	0	3.3	0	-	4.7	2.4	1.7
SC-14 5133	5.9	0	4	0	-	0	0	1.7
MC 5349	0	0	5	7.9	0	0	0	1.8
EC 5536-2	0	0	2.1	6.3	-	3.3	0	1.9
3/4 Souna 135	0	0	0	2.9	-	8.7	0	1.9
SDN 587	0	0	7.9	0	-	0	4.8	2.1
MC 6218	0	0	2.9	2.0	9.7	3.2	0	2.5
ICI 7611 (F4)	0	0	5.1	2.2	-	4.2	5.2	2.9
3/4 Souna 210-2	0	0	2.1	0	3.7	14.3	0	2.9
B Senegal-6 AV.H	0	0	7.1	6.7	2.9	4.5	0	3.0
MC 6199	0	0	9.4	2.4	2.9	5.0	1.7	3.1
MC 5407	0	0	7.7	7.9	0	5.9	0	3.1
3/4 EB 5	0	0	4.6	0	-	15.4	0	3.3
SSC 6049	0	0	3.2	0	13.3	7.7	0	3.5
MC 6108	0	0	5.3	0	-	16.7	0	3.7
GAM-73 5166	0	0	10	10.4	-	0	2.3	3.8
SC-14 5084	0	14.3	3.8	6.2	0	3.2	0	3.9

Contd...

Table 1 Continued

Entry	Hissar		Hyderabad		Kamboinse		Mysore	
	Rep 1	Rep 2	Rep 1	Rep 2	Rep 1	Rep 2	Rep 1	Mean
EB 18-3-1	0	0	10	14.6	0	0	-	4.1
SC-3 5084	0	0	11.9	7.8	10.0	0	0	4.2
WC 6044	0	6.3	6.4	9.8	3.0	3.4	1.7	4.4
EB 25-1-1	0	0	20.9	10.3	0	0	0	4.5
EBS 16-1-2	0	0	5	8.3	0	11.1	7.7	4.6
IVS 5987	8.3	0	1.5	2.7	10.5	7.4	2.6	4.7
GAM 73 FS 6031	0	0	17.9	13.2	0	3.7	0	5.0
EC 5298-2	0	0	13.7	0	19.2	5.6	0	5.5
WC 6016	0	11.1	13.9	10.3	3.6	0	0	5.6
B Senegal-9D	0	0	1.2	0	-	24	9.4	5.8
WC 5371	0	0	6.7	3.3	3.7	25	2.9	5.9
700760-3	5.6	0	2.9	13.0	14.3	0	6.3	6.0
GAM 73 FS 6195	0	0	18.2	9.1	7.7	6.7	0	6.0
SC-1 5137	0	0	19.0	12.5	3.3	5.0	2.8	6.1
MC 6146	0	0	0	3.3	8.7	31.0	0	6.1
SSC 6101	0	0	9.5	2.1	-	21.1	4.3	6.2
3/4 EB 24-1	0	0	6.2	3.2	19.2	7.1	9.1	6.4
MC 5010	0	0	0	2.6	27.3	16	0	6.6
MC 6052	0	0	7.5	14.5	16.1	0	7.9	6.6
WC 5004	9.1	0	0	6.5	15.4	17.6	0	6.9
NIG.COMP RM 55	0	0	12.5	10.3	-	19.2	0	7.0
WC 6204	0	0	6.0	10.7	17.2	16.0	0	7.1
SDN 228-1	0	0	0	0	26.3	21.4	3.6	7.3
3/4 Souna 145-2	0	-	8.7	6.2	18.5	3.7	-	7.4
GAM 75 6175	0	-	10.5	26.1	-	8.3	0	7.5
LC 5247	0	0	14.3	25.9	-	0	5.3	7.6
SSC 6047	0	0	7.5	3.2	10.0	33.3	0	7.7

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Table 1 Continued

Entry	Hissar		Hyderabad		Kamboinse		Mysore	
	Rep 1	Rep 2	Rep 1	Rep 2	Rep 1	Rep 2	Rep 1	Mean
WC 6025	0	0	26.1	13.5	-	6.7	0	7.7
GAM 73 S2 6119	0	0	32.3	14.7	-	0	0	7.8
GAM 75 6114	0	0	9.8	16.1	4.5	4.3	21.1	8.0
MC 6124	0	0	10.8	2.6	36.4	6.1	0	8.0
IVS 5489	0	0	1.9	2.8	19.2	33.3	0	8.2
MC 6144	0	0	8.3	8.1	10.0	30.8	0	8.2
SSC 6030	0	18.2	16.2	13.8	0	9.1	0	8.2
SDN 347-1	14.3	0	13.3	14.0	17.4	0	0	8.4
LC-A x 76	0	0	13.3	17.5	23.5	0	6.7	8.7
GAM-73 5181	0	0	6.5	22.6	-	21.7	2.1	8.8
GAM 75 6149	0	0	32.1	6.3	13.0	13.3	0	9.2
3/4 Souna 1-2	0	0	33.8	20.0	-	0	2.2	9.3
3/4 Souna 236-2	0	25.0	12.5	17.1	-	0	2.0	9.4
WC-A x 76	0	6.7	23.8	7.7	24.2	5.6	0	9.7
SSC-A x 76	0	14.3	20.5	13.0	8.8	8.7	3.6	9.8
MC 6118	0	0	25.0	20.0	-	15.6	0	10.1
LC 5242	0	0	13.1	21.0	-	20.0	8.0	10.4
SC-1 5026	-	0	17.2	22.2	-	31.8	2.5	10.6
IVS 5718	0	0	27.3	12.8	20.0	11.1	4.5	10.8
WC 6124	0	0	10.1	8.1	-	42.9	6.7	11.3
WC 6173	-	15.4	3.9	2.4	28.6	9.7	8.2	11.4
SC1 (S) 4-18	0	13.3	14.3	22.4	19.2	5.1	6.3	11.5
MC-A x 76	0	15.4	7.9	11.5	20.0	28.6	0	11.9
SERERE-33	0	14.3	14.8	11.1	26.3	15.8	3.4	12.2
MC 6054	7.7	0	4.2	12.9	13.8	45.0	2.3	12.3
Souna B	0	0	31.4	27.5	-	12.5	2.5	12.3
MC 6067	9.1	10.0	29.3	21.7	11.5	5.7	0	12.5

Contd...

Table 1 Continued

Entry	Hissar		Hyderabad		Kamboinse		Mysore	Mean
	Rep 1	Rep 2	Rep 1	Rep 2	Rep 1	Rep 2	Rep 1	
MC 6090	0	0	0	0	42.9	40.0	5.3	12.6
MC 6090	0	0	0	0	42.9	40.0	5.3	12.6
IVS 5427	0	0	20.0	13.8	30.4	25.0	2.9	13.2
EB 15-1-2	5.6	0	2.7	2.5	50.0	31.8	0	13.2
MC 6234	33.3	0	11.9	9.6	27.8	10.5	0	13.3
MC 6185	0	0	88.9	4.3	0	0	0	13.3
EB 208-3	5.6	-	7.1	6.1	0	67.7	0	14.4
SSC 6192	0	0	14.3	14.3	31.8	41.9	0	14.6
SSC 6031	0	-	6.7	23.8	35.7	23.5	3.4	15.5
EBS 137-2-2	0	0	4.5	2.9	58.3	44.8	0	15.8
MC 6123	0	0	35.1	12.1	-	42.3	6.5	16.0
EC 5166-2	0	0	18.6	13.8	20.8	50.0	10.5	16.2
MC 6020	33.3	33.3	20.6	5.9	7.4	8.7	8.3	16.8
GAM 75 6246	0	0	19.7	48.1	0	42.9	7.9	16.9
WC 6070	0	0	37.0	46.3	20.0	16.7	0	17.1
C 73A x 76	0	0	72.2	19.0	14.8	9.5	6.9	17.5
EBS 150-1-2	0	-	38.7	35.4	-	9.5	4.4	17.6
GAM 73 FS 6009	0	0	26.5	35.3	-	21.7	28.3	18.6
MC 6156	0	0	35.5	63.8	7.1	23.5	0	18.6
EC 5176-2	25.0	0	3.8	20.5	22.6	53.6	8.3	19.1
700620-23	5.9	16.7	37.3	27.3	24.2	5.3	16.7	19.1
MC 6095	4	0	59.3	20.0	20.7	28.6	2.7	19.3
SSC 6176	12.5	0	27.0	11.4	30.4	54.5	0	19.4
B Senegal-5 S-D	0	0	42.2	17.9	39.1	31.8	5.7	19.5
NW 1-10-1	0	5.9	26.2	15.1	38.9	53.8	2.2	20.3
B Senegal-12	0	12.5	36.8	17.9	-	55.6	0	20.5
P-25	0	-	87.1	12.5	8.0	16.7	0	20.7

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