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Progress Report: MP 104

INTERNATIONAL PEARL MILLET DISEASE RESISTANCE TESTING PROGRAM
(IPMDRTP)



REPORT ON
THE SEVENTH (1983) INTERNATIONAL PEARL MILLET ERGOT NURSERY
(IPMEN)



ICRISAT

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ABSTRACT

The 32-entry 1983 International Pearl Millet Ergot Nursery (IPMEN) seventh in the series, was evaluated at 10 locations in India, and 1 each in Nigeria and Niger. Although no entry remained ergot free at all locations, 18 entries had across-locations mean severities of not more than 2% and the maximum severity of not more than 5% at any one location. The remaining 11 entries had across-locations mean severities of 2 to 15% compared with 33, 54 and 65% severities on local resistant, local susceptible and the trial check (BJ 104), respectively. Many entries which were resistant to ergot in India were also resistant at Samaru for the second successive year. Eight entries (ICMPE 34-1-10 and ICMPE 16, -23, -24, -26, -28, -31 and -32), besides showing high resistance to ergot were also resistant to smut and downy mildew across locations in India and West Africa.

RESUME

Les 32 entrées de la Pépinière internationale 1983 sur l'ergot du petit mil (IPMEN, International Pearl Millet Ergot Nursery) septième dans la série, ont été évaluées à 10 emplacements en Inde et 1 chacun au Nigeria et au Niger. Aucune entrée n'a été exempte d'ergot sur tous les emplacements, toutefois 18 entrées se sont avérées résistantes, ayant une moyenne de sévérité de 2% sur l'ensemble des emplacements et une sévérité maximale de 5% à l'un ou l'autre des emplacements. Le reste des 11 entrées ont des sévérités moyennes de 2 à 15% sur l'ensemble des sites par rapport à 33, 54 et 65% de sévérité sur les variétés locales résistante et sensible et le témoin local (BJ 104) respectivement. Plusieurs entrées résistantes à l'ergot en Inde se sont montrées résistantes à Samaru aussi pour la deuxième année de suite. Huit entrées (ICMPE 34-1-10 et ICMPE 16, -23, -24, -26, -28, -31 et -32) ont été très résistantes non seulement à l'ergot mais aussi au charbon et au mildiou sur l'ensemble des emplacements en Inde et en Afrique de l'Ouest.

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**REPORT ON THE SEVENTH (1983) INTERNATIONAL PEARL MILLET ERGOT NURSERY
(IPMEN)**

INTRODUCTION

The International Pearl Millet Ergot Nursery (IPMEN) is a component of the International Pearl Millet Disease Resistance Testing Program (IPMDRTP) coordinated by the Pathology Sub-Program in the ICRISAT Pearl Millet Improvement Program with the following objectives:

1. To test the stability of ergot resistant lines (only ICRISAT center developed lines were tested and none were contributed from other locations);
 2. To monitor variations in the pathogen populations;
- and
3. To provide scientists with disease resistant sources for utilization in the resistance breeding programs.

The 1983 IPMEN was sent to cooperators at 15 locations in India and West Africa and results received from 12 of these locations are presented in this report.

ENTRIES

The 1983 IPMEN consisted of 32 entries including 16 promising entries from the 1981 and 1982 IPMENS, 13 new entries developed at ICRISAT Center and 3 checks (local resistant, local susceptible and a trial check). The local resistant and the susceptible checks were

included by cooperators at each location.

IPMEN DISTRIBUTION

The IPMEN was distributed to cooperators at 12 locations in India and 1 each in Nigeria, Niger and Zambia (Table 1). Results were obtained from 12 locations including both West African locations.

IPMEN MANAGEMENT

Each entry was planted in two 4m-row plots in 2 replications. Cultural practices followed were as per the recommendations for the individual locations. Ten plants per row were bagged at the boot-leaf stage and inoculated at protogyny 2-3 days later using an aqueous honeydew conidial suspension and rebagged immediately after inoculation. This inoculation method was followed at eight locations, while at Mysore, Delhi and Aurangabad bagging was not done prior to inoculation and at Samaru ergot scores were taken under natural disease pressure (plants were neither bagged nor inoculated). Ergot severity scores were taken 15-20 days after inoculation using the standard severity assessment key provided with the IPMEN field book.

DATA RECEIVED

In addition to ergot scores cooperators provided data on weather (temperature and rainfall), days to 75% stigma emergence (flowering) and scores on other prevalent diseases such as smut, downy mildew (DM), rust and blast.

RESULTS**Weather**

Data on rainfall, number of rainy days and temperature (max. and min.) during inoculation to disease evaluation were received from 10 locations (Table 2). The number of rainy days varied from 28 at Durgapura to 2 at Ludhiana. The amount of rainfall was maximum at Aurangabad, (551 mm in 23 days) and minimum (4.1 mm in 2 days) at Ludhiana. At ICRISAT Center in addition to 310.4 mm precipitation (in 15 days) sprinkler irrigations were provided once or twice daily on rain-free days to maintain high humidity.

The highest maximum temperature experienced was at Jamnagar (33.2 C) and the lowest maximum at ICRISAT center (26.9 C). The highest minimum temperature occurred at Durgapura (24 C) and the lowest minimum at Ludhiana (16.8 C).

PERFORMANCE OF ENTRIES

The mean ergot severities, days to 75% flowering and scores for other diseases, for each location, are presented in Tables 3 to 14.

Hissar (Table 3): The mean ergot severity for the test entries ranged from 0 to <1%. Fifteen entries were completely free and the remaining 14 had ergot in traces (<1%) compared with 36% on BJ-104, 51% on local susceptible and 47% on local resistant lines.

Mean smut severity varied from 0 to 20% on test entries. Eighteen entries remained smut free and the remaining entries had smut in the range of 2 to 20% compared with 72, 57 and 72% severity on BJ-104, local susceptible and local resistant lines, respectively.

Nineteen of the 29 entries were DM free and the remaining 10 entries had 1 to 9% DM compared with 57, 42 and 76% on BJ-104, local susceptible and local resistant lines, respectively.

Mean rust severity varied from 5 to 37% on test entries. Twentythree entries had <10% and the remaining entries had rust in the range of 17 to 37% compared with 40, 52, and 40% on BJ-104, local susceptible and local resistant lines, respectively.

Blast was low to moderate on all the entries, ranging from 1.5 to 4 compared with 3.5 to 4.5 on the checks on a 1-5 scale (1=free and 5=severe).

Many of the ergot resistant lines also showed resistance to DM, smut and to some degree rust and blast.

Coimbatore (Table 4): Mean ergot severities on test entries ranged from 0 to 3% and the local susceptible and trial check, BJ-104 had only 2 and 1% severity, respectively.

Most of the test entries were free from DM compared with 25% incidence on the local susceptible.

Rust was low to moderate on most of the entries.

Maradurga (Table 5): Mean ergot severities of test entries ranged from 0 to 5% compared with 78 to 82% on the checks. Fifteen entries were ergot free and the remaining had ergot ranging from <1% to 5%.

Most of the ergot resistant lines were also resistant to smut and rust under natural disease pressures.

Mysore (Table 6): Mean ergot severities ranged from 0 to 5%; 12 entries were ergot free, 14 had <1% severity and the remaining 3 had between 4 and 5% severity compared with 51 and 62% on BJ-104 and the local susceptible check, respectively. The local resistant check (?) had 8% severity.

Twentytwo of the 29 test entries and BJ-104 were free from DM and most entries had a very low level of rust.

Samaru (Table 7): Ergot severities varied from 0 to 9% on test entries compared with 89% on BJ-104. Twentyfour entries had <1% severity and the remaining 5 entries had ergot in the range of 2 to 9%.

Most of the ergot resistant lines were free from smut.

Although DM incidence was quite high, ranging from 0 to 96%, 4 entries remained DM free and 9 had DM incidence of 3 to 9%.

New Delhi (Table 8): Mean ergot severities ranged from 0 to 12% for the test entries compared with 52-54% on the susceptible checks and 28% on the local resistant check (?). Four entries were ergot free, 17 others had <1% ergot and the remaining entries scored between 2 and 12% severity. Most of the ergot free entries were also free from DM, and only three entries had DM incidence in the range of 11 to 14% compared with 70% on the local susceptible (MHB-3) and 39% on BJ-104.

ISC Sadore (Table 9): Mean ergot severities varied from 0 to 15%; 9 entries remained ergot free, 19 others had ergot between <1 and 3% and only one entry had 15% ergot compared with 27% on BJ-104, 26% on the local susceptible and 6% on the local resistant checks. All entries had < 2% DM incidence.

Pune (Table 10): Although no line was ergot free, mean severities ranged from <1 to 12% on the test entries compared with 89% on BJ-104. Twenty entries showed <1% ergot and the remaining 9 entries between 2 and 12%.

DM incidence was quite high on some entries. Five entries remained DM free, 15 entries had 1 to 10% and the remaining 9 entries had 11 to 84% incidence, compared with 86% on local susceptible (NHB-3) and 17% on BJ-104.

Rust incidence was low to moderate (2 to 40%), and most entries were either blast-free or developed very little blast.

Jamnagar (Table 11): Mean ergot severities varied from 0 to 20%; one entry remained ergot free, 19 others had <1% severity, 8 had 2 to 7% and only one entry scored 20% severity compared with 41 to 46% on the checks.

Most of the ergot resistant entries were also resistant to smut, DM and rust. BJ-104 showed 60% smut, remained free from DM and showed a trace of rust.

Ludhiana (Table 12): Although no entry was ergot free, the mean

ranged from 1 to 10% compared with 11% on the local resistant, 56% on local susceptible and 66% on BJ-104. Twentyfive of the 29 test entries showed <5% ergot severity and the remaining 4 scored between 6 and 10%.

ICRISAT Center (Table 13): Twentyfour of the 29 test entries showed <2% ergot severity and the remaining 5 scored between 10 and 56% compared with 90-91% on the susceptible checks.

DM incidence varied from 0 to 13% on the test entries and 34% on BJ-104 in the DM nursery. Thirteen of 29 entries were DM-free, 15 had 1 to 10% and only one entry had 13% incidence

Smut severity ranged from 0 to 2% on test entries while BJ-104 had 82%. All the ergot resistant entries had high resistance to smut under artificial inoculation.

Rust severity ranged from 0 to 65%; several entries had a trace to moderate rust compared with 100% severity on BJ-104 under natural rust pressure.

Aurangabad (Table 14): Twentyone of the 29 test entries had mean ergot severity of <2% and the remaining 8 entries scored between 3 and 40% severity compared with 94% on BJ-104.

DM incidence varied from 0 to 47% on the test entries. Seven entries remained DM free, 11 entries scored between 1 and 10% and the remaining had from 12 to 47% incidence. BJ-104, however, had only 1% incidence.

Most of the test entries had a trace to moderate levels of rust (0 to 40%) while BJ-104 and the local susceptible had 82 and 100% severity, respectively.

Performance across locations

Ergot: The minimum ergot pressure, as indicated by severity on the susceptible check, BJ-104, occurred at Coimbatore (1%) and the maximum at Aurangabad (94%). The location mean across test entries was minimum (<1%) at Hissar and maximum (6%) at Aurangabad (Table 15).

Eighteen of the 29 test entries had overall across locations mean ergot severity of 4% (which is less than the overall location mean) with maximum of 5% at any one location, and the remaining 11 entries had mean severities between 2 and 15% compared with 65% on BJ-104, 54% on local susceptible checks and 33% on local resistant checks.

Downy Mildew: DM reactions received from eight locations in India, Samaru in Nigeria and Sadore in Niger are summarised in Table 16. DM pressure, as indicated by location means across entries, was minimum at Coimbatore, Mysore and Sadore (<1% incidence at each location) and maximum at Samaru (34%). Many of the ergot resistant lines which also had high DM resistance in India were DM susceptible at Samaru. However, eight entries were found to have high DM resistance in addition to their ergot resistance at all locations, including Samaru, Nigeria.

DISCUSSION

Ergot resistant lines (ICMPE & ICMPEs Nos.) developed at ICRISAT Center have been tested for 2-3 years at several locations in India and West Africa. Results presented in Table 15 clearly show the stability of resistance of these lines. Until 1980 a majority of the IPMEN entries were selections from the germplasm and breeding lines and none of these showed consistently high resistance across locations over years. Since 1981 with the inclusion of ICMPE and ICMPEs numbers, stable ergot resistant lines have been identified (Table 17). There was no clear indication of pathogenic variation within the pathogen populations to which the IPMEN entries were exposed.

Eight of the 1983 IPMEN entries showed high resistance to smut and DM across locations in addition to their high resistance to ergot (Table 18). It is encouraging to note that these lines have been resistant both at Indian and West African locations to all three diseases. Wider testing of these lines, is however, at more locations in West Africa needed to confirm the results.

Due to a lack of sprinkler systems and relatively dry weather prevailing at flowering, ergot pressure remained low at some of the Indian locations, particularly at Coimbatore where EJ-104 had only 1% severity and proper screening could not be conducted. However, performances of the entries across locations over years confirm their resistance.

Several ergot resistant lines are being utilised at ICRISAT Center and Indian programs to develop ergot resistant hybrids and varieties.

MULTILOCATIONAL TESTING IN 1984

The 1984 IPMEN with about 30 entries will be made available to cooperators by May-June 1984. Entries are welcome from scientists in the National and Regional programs, provided, they have been found to be resistant at the home locations.

SEED SUPPLY

Small quantities of seed of entries listed in this report will be made available to interested scientists on request to the Principal Plant Pathologist, Pearl Millet Improvement Program, ICRISAT.

Table 1. Locations and cooperators(s) in the 1983 IPMEN

Country	Location	Cooperator(s)
India	Aurangabad	N.B. Pawar & S.S. Ghuge
"	Coimbatore	K. Govindarajan
"	Durgapura	Govind Singh & S.C. Jain
"	Hissar	D.P. Thakur
"	ICRISAT Center	R.P. Thakur & V.P. Rao
"	Jamnagar	S.D. Nafade & H.R. Dave
"	Ludhiana	S.S. Chahal
"	Mysore	H.S. Shetty & H.S. Prakash
"	New Delhi	S.B. Mathur & Janki Kandhari
"	Pantnagar ^a	D.V.S Tyagi
"	Pudukkottai ^a	Thulasidas
"	Pune	S.S. Bangar & M.S. Ranu
Niger	ISC, Sadore	E.J. Guthrie & M. Sidamar
Nigeria	Samaru	D.A. Alawode
Zambia	Kaoma ^a	I.J. Siddiqui

^a Data not received.

Table 2. Planting date, rainfall and temperature data at ten of the 1983 IPMEN locations

Location and	Latitude	Planting date	Time period	Inoculation to disease evaluation		No. of rainy days	Rainfall (mm)
				Temperature C	Temperature C		
				Max.	Min.		
Ludhiana	(36° 56')	July 21	Oct. 1 - Oct. 23	32.1	16.8	2	4.1
New-Delhi	(28° 35')	July 31	Sep. 16 - Oct. 30	32.6	20.1	5	44.4
Durgapura		July 5	Aug. 15 - Oct. 15	32.6	24.0	28	217.9
Jamagar	(22° 28')	July 15	Sep. 1 - Oct. 15	33.2	-	9	61.9
Aurangabad	(19° 53')	July 14	Aug. 25 - Sep. 30	-	-	23	551.0
Pune	(18° 32')	July 22	Sep. 12 - Oct. 19	29.2	20.9	20	310.5
ICRISAT Center	(17° 26')	July 21	Sep. 14 - Oct. 31	26.9	17.9	15	310.4 ^a
ISC, Sadore	(13° 15')	June 30	Aug. 20 - Oct. 3	33.0	23.0	12	239.7
Coimbatore	(11°)	Oct. 10	Dec. 11 - Jan. 1, '84	28.1	20.4	8	124.3
Mysore	(12° 15')	July 2	Aug. 21 - Sep. 24	27.9	18.9	19	132.0

^a In addition sprinkler irrigation was provided once or twice a day for 30 min. each on rain-free days.

(-) Data not provided.

Table 3. Ergot, smut, downy mildew (DM), rust and blast reactions, and days to 75 percent flowering (DTF) of the 32 entry 1963 IPMEN at Hissar

Entry	DTF	Ergot sev. (%)			Smut ^b sev. (%)	DM ^c (%)	Rust ^d sev. (%)	Blast ^e sev. (%)
		Rep.1	Rep.2	Mean ^a				
ICMPE 13-6-27	74	0	0	0	2	0	37	3.0
ICMPE 13-6-30	72	0	0	0	0	9	10	2.0
ICMPE 134-6-9	72	0	0	0	0	0	10	2.0
ICMPE 134-6-11	64	0	0	0	2	0	10	2.5
ICMPE 134-6-25	67	0	0	0	0	0	10	2.5
ICMPES-1	76	0	0	0	0	0	10	2.0
ICMPES-2	72	0	0	0	0	0	10	2.5
ICMPES-11	73	0	0	0	0	2	7	2.5
ICMPES-15	73	0	0	0	0	0	5	4.0
ICMPES-17	70	0	0	0	0	1	7	2.0
ICMPES-23	69	0	-	0	-	1	25	3.0
ICMPES-24	72	0	0	0	0	0	5	2.0
ICMPES-26	72	0	0	0	0	3	7	2.0
ICMPES-27	71	0	0	0	0	0	5	1.5
ICMPES-31	67	0	0	0	15	0	7	2.0
ICMPE 34-1-10	69	<1	0	<1	12	2	10	3.0
ICMPE 134-6-34	67	<1	0	<1	5	2	7	1.5
ICMPE 134-6-41	62	<1	0	<1	0	0	10	2.5
ICMPES-6	52	0	<1	<1	5	0	17	3.5
ICMPES-9	75	<1	<1	<1	0	0	5	2.5
ICMPES-16	69	0	<1	<1	0	0	10	2.5
ICMPES-22	67	<1	<1	<1	2	2	10	3.0
ICMPES-28	69	<1	0	<1	0	1	7	2.5
ICMPES-32	56	0	<1	<1	12	0	10	4.0
ICMPES-33	69	<1	0	<1	0	0	17	2.0
ICMPES-34	52	<1	0	<1	0	0	17	3.0
ICMPES-37	72	0	<1	<1	2	0	17	3.5
700708-1-E-1	70	<1	0	<1	0	2	5	2.0
J 2238-2-E-4-1	49	<1	0	<1	20	0	10	3.0
Local Resistant	41	39	56	47	72	76	40	4.0
Local Susceptible	41	42	61	51	57	42	52	4.5
Trial Check (BJ-104)	42	38	34	36	72	57	40	3.5

^a Mean of 20 bagged-inoculated inflorescences from 2 reps.

^b Mean of 2 reps, under natural infection.

^c Mean incidence (%) of 2 reps.

^d Mean severity (%) of 2 reps, based on modified Cobb's scale.

^e Mean severity (%) of 2 reps, based on 1-5 scale.

(-) Data not provided.

Table 4. Ergot, downy mildew (DM) and rust reactions, and days to 75 percent flowering (DTP) of the 32 entry 1983 IPMEN at Coimbatore

Entry	DTP	Ergot severity (%)			DM ^b	Rust ^c sev. (%)
		Rep. 1	Rep. 2	Mean ^a		
IOMPE 134-6-11	51	0	0	0	0	40
IOMPE 134-6-41	52	0	0	0	0	40
IOMPE 13-6-27	55	<1	<1	<1	0	40
IOMPE 13-6-30	54	<1	<1	<1	0	40
IOMPE 34-1-10	51	<1	<1	<1	0	40
IOMPE 134-6-9	55	<1	<1	<1	0	40
IOMPE 134-6-25	56	<1	<1	<1	0	25
IOMPES-2	48	<1	<1	<1	0	40
IOMPES-27	52	<1	<1	<1	0	25
IOMPES-34	50	<1	<1	<1	0	40
IOMPE 134-6-34	52	1	1	1	4	25
IOMPES-1	59	1	1	1	0	40
IOMPES-15	59	1	<1	1	0	25
IOMPES-16	54	1	1	1	0	25
IOMPES-17	58	1	1	1	0	25
IOMPES-23	55	1	1	1	0	25
IOMPES-24	54	1	1	1	0	40
IOMPES-26	54	1	1	1	0	25
IOMPES-28	54	1	1	1	0	40
IOMPES-31	57	1	1	1	0	25
IOMPES-32	52	1	1	1	0	40
IOMPES-37	52	<1	1	1	0	40
700708-1-E-1	53	1	1	1	2	25
J2238-2-E-4-1	51	1	1	1	2	40
IOMPES-6	52	2	2	2	0	40
IOMPES-11	57	2	2	2	0	40
IMEES-22	52	2	2	2	0	25
IOMPES-33	54	2	2	2	0	40
IOMPES-9	56	4	3	3	0	40
Local Resistant	-	-	-	-	-	-
Local Susceptible	50	2	2	2	25	40
Trial Check (BJ 104)	44	1	2	1	5	40

^a Mean of 40 bagged-inoculated heads from 2 reps.

^b Mean incidence (%) of 2 reps.

^c Mean of 2 reps, based on modified Cobb's scale.

(-) Data not provided.

Table 5. Ergot, smut and rust reactions of the 32 entry IPMEN at Durgapura

Entry	Ergot severity (%)			Smut (%)	Rust (%)
	Rep.1	Rep.2	Mean ^a		
ICMPE 134-6-41	0	0	0	0	5
ICMPE 13-6-30	0	0	0	0	5
ICMPES-23	0	0	0	0	5
ICMPE 134-6-9	0	0	0	0	5
ICMPES-9	0	0	0	0	5
ICMPES-27	0	0	0	0	5
ICMPE 134-6-34	0	0	0	0	5
ICMPES-16	0	0	0	0	5
ICMPES-32	0	0	0	5	5
ICMPES-2	0	0	0	0	5
ICMPES-15	0	0	0	0	5
ICMPES-24	0	0	0	0	5
ICMPES-11	0	0	0	0	5
ICMPES-28	0	0	0	0	5
700708-1-E-1	0	0	0	0	5
ICMPE 34-1-10	<1	<1	<1	0	5
J2238-2-E-4-1	<1	<1	<1	5	5
ICMPES-26	<1	<1	<1	0	5
ICMPES-17	<1	1	1	0	5
ICMPES-1	1	1	1	0	10
ICMPE 134-6-25	1	1	1	0	5
ICMPE 134-6-11	1	1	1	0	25
ICMPE 13-6-27	1	1	1	0	5
ICMPES-34	1	2	1	0	5
ICMPES-6	2	2	2	0	5
ICMPES-31	2	2	2	0	5
ICMPES-37	2	5	3	0	5
ICMPES-33	5	5	5	0	5
ICMPES-22	6	4	5	0	5
Local Resistant	84	80	82	50	40
Local Susceptible	83	81	82	60	40
Trial Check (BJ 104)	76	80	78	55	40

^a Mean of 40 bagged-inoculated heads from 2 reps.

^b Mean severity (%) of 2 reps.

^c Mean severity of 2 reps, based on modified Cobb's scale.

Table 6. Ergot, downy mildew (DM) and rust reactions, and days to 75 percent flowering (DTF) of the 12 entry 1981-1982 at Mysore

Entry	DTF	Ergot severity (%)			DM ^b (%)	Rust ^c sev. (%)
		Mean ^a	Max	Min		
IOPE 13-6-27	58	0	0	0	4	7
IOPE-1	51	0	0	0	0	5
IOPE-23	59	0	0	0	0	5
IOPE-24	57	0	0	0	0	5
IOPE 134-6-11	56	0	0	0	0	7
IOPE 134-6-25	51	0	0	0	0	15
IOPE 134-6-34	54	0	0	0	0	5
IOPE 134-6-41	54	0	0	0	1	10
IOPE-17	56	0	0	0	0	5
IOPE-27	58	0	0	0	0	5
IOPE-16	59	0	0	0	0	5
IOPE-28	57	0	0	0	0	10
IOPE 134-6-9	50	<1	0	<1	1	7
IOPE-2	54	<1	0	<1	0	5
IOPE-15	55	<1	0	<1	1	25
IOPE-11	56	<1	<1	<1	0	7
700708-1-E-1	58	<1	<1	<1	1	25
IOPE-33	53	1	<1	<1	0	25
IOPE-31	51	1	0	1	0	5
IOPE-22	58	1	1	1	0	5
IOPE-26	58	1	1	1	1	7
IOPE 13-6-30	57	<1	2	1	0	5
IOPE-34	51	<1	2	1	0	25
IOPE-37	53	<1	2	1	0	5
IOPE-9	55	1	1	1	1	5
IOPE-32	55	1	2	1	0	5
J2258-2-E-4-1	50	6	2	4	0	5
IOPE-6	55	7	1	4	0	5
IOPE 34-1-10	56	3	6	5	0	5
Local Resistant	42	9	7	8	0	5
Local Susceptible	42	60	64	62	11	7
Trial Check (BJ 104)	44	50	52	51	0	25

^a Mean of 40 inoculated heads from 2 reps. Heads not bagged prior to inoculation.

^b Mean incidence (%) of 2 reps.

^c Mean severity (%) of 2 reps, based on modified Cobb's scale.

Table 7. Ergot, smut, downy mildew (DM) and days to 75 percent flowering (DTF) of the 12 entry 1983 IPMWH at Samaru

Entry	DTF	Ergot severity (%)			Smut ^b sev. (%)	DM ^c (%)
		Rep.1	Rep.2	Mean ^a		
IOMPES-1	74	-	0	0	0	92
IOMPE 13-6-27	63	0	1	<1	1	91
IOMPE 134-6-9	64	-	<1	<1	0	50
IOMPE 134-6-25	63	1	0	<1	5	41
IOMPES-24	69	<1	<1	<1	0	0
IOMPES-27	67	<1	<1	<1	0	3
IOMPES-28	64	<1	<1	<1	1	9
IOMPE 13-6-30	61	1	1	1	3	96
IOMPE 134-6-11	63	1	1	1	1	28
IOMPE 134-6-34	63	1	1	1	3	66
IOMPE 134-6-41	63	1	<1	1	2	66
IOMPES-2	68	1	<1	1	1	75
IOMPES-9	67	1	1	1	0	9
IOMPES-15	73	1	1	1	1	23
IOMPES-17	64	1	1	1	1	6
IOMPES-23	70	1	<1	1	1	0
IOMPES-26	63	1	<1	1	1	0
IOMPES-31	63	1	1	1	2	0
IOMPES-32	64	1	1	1	1	5
IOMPES-34	68	1	1	1	0	75
IOMPES-37	63	1	1	1	<1	65
700708-1-E-1	64	1	1	1	1	21
IOMPE 34-1-10	63	2	<1	1	3	3
IOMPES-22	65	1	1	1	0	4
IOMPES-6	65	1	3	2	7	33
IOMPES-16	65	2	2	2	1	3
IOMPES-33	65	3	2	2	3	79
IOMPES-11	63	3	2	2	5	29
J2238-2-E-4-1	63	9	10	9	5	3
Local Resistant	64	12	13	12	32	3
Local Susceptible	63	6	9	7	15	1
Trial Check (BJ 104)	51	91	88	89	10	37

^a Mean of 20-40 naturally inoculated heads from 2 reps.

^b Mean of 2 reps.

^c Mean incidence (%) of 2 reps.

(-) Data not provided.

Table 8. Ergot and downy mildew (DM) reactions, and days to 75 percent flowering (DTF) of the 32 entry 1963 IPMEN at New Delhi

Entry	DTF	Ergot severity (%)			DM ^b (%)
		Rep. 1	Rep. 2	Mean ^a	
IONPE 134-6-9	62	0	0	0	0
IONPE 134-6-11	64	0	0	0	0
IONPES-2	57	0	0	0	0
IONPES-37	52	0	0	0	0
IONPES-34	64	0	<1	<1	0
IONPES-11	62	<1	0	<1	5
IONPES-27	64	<1	0	<1	0
IONPE 134-6-25	52	<1	0	<1	0
IONPES-15	64	1	0	<1	0
IONPES-26	64	<1	<1	<1	0
IONPE 134-6-34	64	<1	<1	<1	0
IONPES-23	64	1	<1	<1	0
IONPE 134-6-41	64	0	<1	<1	0
IONPES-32	57	<1	1	1	0
IONPES-16	59	<1	1	1	0
IONPES-9	64	1	1	1	14
IONPES-22	59	1	1	1	3
IONPE 13-6-27	64	1	2	1	11
IONPES-33	64	1	2	1	0
IONPES-1	59	1	2	1	2
IONPES-31	64	2	<1	1	4
IONPES-17	62	2	1	2	3
IONPE 13-6-30	57	1	2	2	12
IONPES-28	62	3	1	2	0
IONPE 34-1-10	64	2	1	2	0
IONPES-6	62	2	2	2	0
IONPES-24	64	3	2	3	0
J2238-2-E-4-1	52	4	16	10	0
700708-1-E-1	64	9	16	12	4
Local Resistant	43	28	28	28	0
Local Susceptible	43	52	53	52	70
Trial Check (BJ 104)	42	50	58	54	39

Mean of 26-40 inoculated heads from 2 reps. Heads not bagged prior to inoculation

Mean incidence (%) of 2 reps.

Table 9. Ergot and downy mildew (DM) reactions of the 32 entry 1983 IPMEN at ISC, Niger

Entry	Ergot severity (%)			DM ^b (%)
	Rep.1	Rep.2	Mean ^a	
IOPE 134-6-9	0	0	0	1
IOPE 134-6-34	0	0	0	0
IOPE-22	0	0	0	1
IOPE-23	0	0	0	0
IOPE-26	0	0	0	0
IOPE-27	0	0	0	0
IOPE-2	0	0	0	0
IOPE-28	0	0	0	0
IOPE-1	0	0	0	0
IOPE 134-6-11	0	<1	<1	2
IOPE-32	0	<1	<1	1
IOPE-17	-	<1	<1	0
IOPE-37	0	<1	<1	1
IOPE-9	0	<1	<1	0
IOPE-34	<1	0	<1	0
IOPE-16	<1	0	<1	0
IOPE-33	1	0	<1	0
IOPE 34-1-10	<1	0	<1	0
IOPE-31	0	<1	<1	0
IOPE-24	1	0	<1	1
IOPE-15	0	2	1	0
IOPE 134-6-25	0	5	2	1
IOPE-11	1	3	2	1
IOPE 134-6-41	2	2	2	0
IOPE-6	0	5	2	2
IOPE 13-6-30	2	-	2	0
IOPE 13-6-27	1	3	2	1
700708-1-E-1	5	2	3	0
J2238-2-E-4-1	18	12	15	0
Local Resistant	<1	12	6	2
Local Susceptible	34	17	26	0
Trial Check (BJ 104)	33	22	27	1

^a Mean of 3-32 bagged-inoculated heads from 2 reps.

^b Mean incidence (%) of 2 reps.

Table 10. Ergot, downy mildew (DM), rust and blast reactions, and days to 75 percent flowering (DTF) of the 32 entry 1983 IPMEN at Pune

Entry	DTF	Ergot severity (%)			DM ^b (%)	Rust ^c sev. (%)	Blast ^d sev. (%)
		2	2	Mean ^a			
IONPES-11	61	<1	<1	<1	10	10	1
IONPES-15	64	<1	<1	<1	4	17	1
IONPES-27	69	<1	<1	<1	8	2	0
IONPES-2	52	1	1	1	0	22	1
IONPE 134-6-11	61	1	1	1	0	22	1
IONPE 13-6-27	63	1	1	1	84	10	1
IONPE 134-6-41	57	1	1	1	1	25	1
IONPE 13-6-30	63	1	1	1	44	5	1
IONPES-34	69	1	1	1	1	25	1
IONPES-37	51	<1	1	1	1	40	1
IONPES-28	63	1	1	1	9	5	1
IONPE 134-6-34	53	1	1	1	1	25	1
IONPES-23	65	1	1	1	2	5	2
IONPES-1	66	1	1	1	34	10	0
IONPES-26	63	1	1	1	11	10	0
IONPES-17	65	<1	2	1	10	22	1
IONPE 134-6-9	65	2	<1	1	0	10	1
IONPES-24	66	1	1	1	11	7	1
IONPES-16	63	1	1	1	9	10	1
IONPE 134-6-25	65	1	2	1	0	10	1
IONPES-32	61	2	2	2	4	10	1
IONPE 34-1-10	66	2	2	2	2	25	1
IONPES-33	65	2	2	2	6	22	0
IONPES-22	64	1	3	2	20	7	2
IONPES-31	63	4	3	4	4	7	0
700708-1-E-1	63	4	5	5	38	40	2
IONPES-9	64	5	7	6	13	5	1
IONPES-6	57	7	8	7	11	40	1
J-2238-2-B-4-1	51	12	12	12	0	40	1
Local resistant	44	74	79	76	5	40	1
Local susceptible	44	44	38	41	86	32	2
Trial Check (BJ-104)	44	91	87	89	17	40	2

^a Mean of 40 bagged-inoculated heads from 2 reps.

^b Mean incidence (%) of 2 reps.

^c Mean severity (%) of 2 reps, based on modified Cobb's scale.

^d Mean of 2 reps, based on 1-5 scale.

Table 11. Ergot, smut, downy mildew (DM) and rust reactions, and days to 75 percent flowering (DTF) of the 32 entry 1983 IPMEN at Jamnagar

Entry	DTF	Ergot severity (%)			Smut ^b (%)	DM ^c (%)	Rust ^d sev. (%)
		Rep. 1	Rep. 2	Mean			
IONPE 134-6-9	75	0	0	0	0	0	0
IONPE 134-6-25	65	0	<1	<1	0	0	0
IONPE 134-6-41	71	<1	0	<1	0	0	0
IONPES-2	66	0	<1	<1	0	0	<1
IONPE 134-6-34	67	0	<1	<1	0	0	0
IONPES-27	70	<1	<1	<1	0	0	0
IONPES-31	64	<1	0	<1	1	1	0
IONPE 13-6-30	70	<1	<1	<1	3	10	<1
IONPES-26	72	<1	<1	<1	1	0	0
IONPES-34	70	<1	<1	<1	2	0	<1
IONPES-16	65	<1	<1	<1	0	1	0
IONPES-15	75	<1	<1	<1	0	0	0
IONPE 134-6-11	67	<1	1	<1	0	0	<1
IONPES-37	65	1	<1	1	1	0	<1
IONPES-33	64	<1	1	1	4	0	<1
IONPES-11	73	1	<1	1	0	1	0
IONPES-28	72	1	1	1	0	0	0
IONPES-24	75	1	1	1	1	0	0
IONPE 13-6-27	72	1	1	1	4	6	0
IONPES-23	74	2	1	1	0	0	0
IONPES-1	73	1	2	2	12	8	<1
IONPES-17	68	3	1	2	0	0	0
IONPES-32	74	1	3	2	1	0	<1
IONPES-22	74	2	4	3	0	0	0
IONPES-6	71	5	5	5	0	0	<1
IONPE 34-1-10	76	3	8	5	5	1	0
IONPES-9	73	5	8	7	2	4	<1
700708-1-E-1	73	5	10	7	0	22	<1
J 2238-2-E-4-1	59	24	16	20	13	0	9
Local resistant	52	43	39	41	48	42	4
Local susceptible	52	36	50	43	63	0	4
Trial check (BJ-104)	55	37	55	46	60	0	<1

^a Mean of 40 bagged-inoculated heads from 2 reps.

^b Mean severity (%) of 2 reps.

^c Mean incidence (%) of 2 reps.

^d Mean severity (%) of 2 reps, based on modified Cobb's scale.

Table 12. Ergot reactions of the 32 entry 1983 IPMEN at Ludhiana

Entry	Ergot severity (%)		
	Mean ^a	Mean ^a	Mean ^a
ICMPE 134-6-9	1	1	1
ICMPES-34	1	1	1
ICMPES-15	1	1	1
ICMPE 134-6-41	1	1	1
ICMPES-26	1	1	1
ICMPES-24	2	<1	1
ICMPES-23	2	1	2
ICMPES-16	2	2	2
ICMPES-2	1	2	2
ICMPE 134-6-11	1	2	2
ICMPES-32	2	2	2
ICMPES-11	2	2	2
ICMPES-28	1	3	2
J2238-2-E-4-1	2	2	2
ICMPES-9	3	1	2
ICMPES-27	3	2	2
ICMPES-22	3	3	3
ICMPE 13-6-27	3	3	3
ICMPES-37	2	3	3
ICMPES-1	3	3	3
ICMPES-17	3	3	3
ICMPE 134-6-25	3	3	3
ICMPES-6	4	4	4
ICMPE 134-6-34	6	4	5
700708-1-E-1	7	3	5
ICMPES-31	6	5	6
ICMPES-35	6	5	6
ICMPE 13-6-30	10	5	8
ICMPE 34-1-10	14	6	10
Local resistant	11	10	11
Local susceptible	51	60	56
Trial Check (BJ 104)	71	61	66

Mean of 24 bagged-inoculated heads from 2 reps.

Table 13. Ergot, downy mildew (DM), smut and rust reactions, and days to 75 percent flowering (DTF) of the 32 entry 1983 IPMEN at ICRISAT Center

Entry	DTF	Ergot severity (%)			DM ^b (%)	Smut ^c sev. (%)	Rust ^d sev. (%)
		No. of heads	Mean ^a	Mean ^a			
IONPE 134-6-9	62	<1	<1	<1	0	0	10
IONPES-2	62	<1	<1	<1	2	0	25
IONPE 134-6-25	62	0	<1	<1	0	0	10
IONPES-11	67	0	<1	<1	4	0	10
IONPES-27	66	<1	<1	<1	0	0	5
IONPE 134-6-41	61	<1	<1	<1	0	<1	25
IONPES-26	66	<1	<1	<1	2	0	5
IONPES-15	67	<1	<1	<1	8	0	10
IONPE 134-6-34	64	<1	<1	<1	3	0	10
IONPES-16	65	1	<1	<1	1	0	5
IONPES-34	64	<1	<1	<1	3	<1	25
IONPES-37	64	1	<1	<1	0	0	25
IONPE 134-6-11	68	<1	1	<1	9	0	25
IONPES-28	69	1	1	1	1	0	5
IONPES-31	66	1	<1	1	0	0	5
IONPES-32	74	<1	1	1	4	0	5
IONPES-1	74	1	1	1	4	0	10
IONPES-24	78	1	1	1	0	0	0
IONPES-17	74	1	1	1	0	0	5
IONPE 13-6-27	78	1	1	1	0	0	10
IONPES-33	66	1	1	1	3	0	10
IONPE 13-6-30	78	2	2	2	0	0	10
IONPES-23	78	1	2	2	1	0	0
IONPE 34-1-10	65	3	2	2	0	0	25
700708-1-E-1	69	11	9	10	13	<1	25
IONPES-22	65	5	18	11	0	0	5
IONPES-9	67	25	9	17	2	0	10
IONPES-6	76	27	25	26	0	<1	10
J 2238-2-E-4-1	56	65	48	56	10	2	65
Local resistant	61	<1	<1	<1	8	0	25
Local susceptible	50	91	89	90	3	72	100
Trial Check (BJ 104)	51	92	91	91	34	82	100

^a Mean of 40 bagged-inoculated heads from 2 reps.

^b Recorded in DM nursery.

^c Mean of 10 inoculated heads in DM nursery.

^d Recorded in DM nursery, on the basis of modified

Table 14. Ergot, downy mildew (DM) and rust reactions, and days to 75 percent flowering (DTF) of the 32 entry 1983 IPMEN at Aurangabad

Entry	TF	Ergot severity (%)			DM ^b (%)	Rust ^c sev. (%)
		No. of heads	Inc. %	Mean ^a		
ICMPES-11	65	<1	<1	<1	31	5
ICMPE 134-6-41	60	<1	<1	<1	2	10
ICMPE 134-6-9	52	<1	<1	<1	0	17
ICMPE 134-6-11	52	<1	<1	<1	1	32
ICMPES-15	66	<1	1	1	17	7
ICMPE 134-6-34	64	1	<1	1	0	17
ICMPES-1	64	<1	1	1	27	17
ICMPE 134-6-25	62	1	1	1	2	17
ICMPES-24	66	1	1	1	4	5
ICMPE 13-6-30	66	<1	1	1	28	25
ICMPES-37	62	1	1	1	0	25
ICMPES-26	64	1	1	1	0	7
ICMPES-16	66	1	1	1	6	5
ICMPES-2	62	1	1	1	0	10
ICMPES-27	66	1	1	1	16	0
ICMPES-23	66	1	2	1	9	0
ICMPES-22	66	1	1	1	12	5
ICMPES-34	64	2	<1	1	0	37
ICMPE 13-6-27	62	1	2	2	28	10
ICMPES-28	66	1	2	2	3	5
ICMPES-9	66	1	3	2	47	5
ICMPES-17	66	3	2	3	18	5
ICMPES-33	62	5	2	4	2	7
700708-1-E-1	62	18	5	12	33	5
ICMPES-32	62	8	23	16	10	5
ICMPE 34-1-10	62	17	28	22	4	7
ICMPES-31	66	21	31	26	7	5
ICMPES-6	64	18	45	31	9	5
J 2238-2-E-4-1	52	49	32	40	0	40
Local resistant	62	54	54	54	0	17
Local susceptible	50	76	80	78	0	100
Trial Check (BJ 104)	48	97	91	94	1	82

^a Mean of 40 inoculated heads from 2 reps. Heads not bagged prior to inoculation.

^b Mean incidence (%) of 2 reps.

^c Mean severity (%) of 2 reps, based on modified Cobb's scale.

Table 15. Mean ergot severity (S) of the 1983 IPMEX entries and local checks at twelve locations with across location means and across entry means

Entry	Locations												Overall ¹⁰		
	Hisazo	Colomb	Durga	Durga	Myrobb	Samaruc	Delhi ¹	ISC	Sadoro	Pures	Jam	Ludh		ICRISAT	Kurab
LOPE 134-6-9	<1	0	0	<1	0	0	<1	0	0	0	0	0	1	1	<1
LOPE 134-6-41	<1	0	0	0	0	0	0	0	0	0	0	0	1	1	<1
LORES-2	0	0	0	<1	0	0	<1	0	0	0	<1	<1	1	1	<1
LORES-15	0	0	0	0	0	0	<1	0	0	0	<1	<1	1	1	<1
LORES-26	0	0	1	<1	1	1	0	0	0	0	<1	<1	1	1	<1
LORES-27	0	0	0	<1	0	0	<1	0	0	0	<1	<1	2	2	<1
LOPE 134-6-27	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
LOPE 134-6-11	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
LOPE 134-6-25	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
LOPE 134-6-34	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
LORES-1	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0
LORES-11	0	0	0	<1	0	0	<1	0	0	0	<1	<1	1	1	0
LORES-16	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
LORES-23	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
LORES-24	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
LORES-28	<1	0	0	0	0	<1	0	0	0	0	0	0	2	2	0
LORES-34	<1	0	0	0	0	<1	0	0	0	0	0	0	1	1	0
LORES-34	<1	0	0	0	0	<1	0	0	0	0	0	0	1	1	0
LORES-34	<1	0	0	0	0	<1	0	0	0	0	0	0	1	1	0
LORES-37	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
LORES-17	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
LOPE 13-6-30	0	0	0	<1	0	0	0	0	0	0	0	0	1	1	0
LORES-22	<1	0	0	0	0	0	0	0	0	0	0	0	1	1	0
LORES-32	<1	0	0	0	0	0	0	0	0	0	0	0	1	1	0
LORES-33	<1	0	0	0	0	0	0	0	0	0	0	0	1	1	0
LORES-9	<1	0	0	0	0	0	0	0	0	0	0	0	1	1	0
LOPE 34-1-10	<1	0	0	<1	0	0	0	0	0	0	0	0	1	1	0
LORES-31	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
700708-1-E-1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
LORES-6	<1	0	0	0	0	0	0	0	0	0	0	0	1	1	0
J 2258-2-E-4-1	<1	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Location mean ⁹	<1	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Local Resistance	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Local Susceptible	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Total Check (DJ-104)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
36	51	47	78	51	62	82	82	82	82	82	82	82	82	82	82
Mean of 20-40 bagged-located inflorescences from 2 reps.	<1	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Mean of 20-40 bagged-located inflorescences from 2 reps.	<1	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Mean of 20-40 inflorescences under natural infection	<1	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Location mean across entries	<1	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Entry mean across locations	<1	0	0	0	0	0	0	0	0	0	0	0	1	1	0

Table 16. Mean downy mildew incidence (%)^a of the 1983 IPRES entries and local checks at ten locations with across location means and across entry means

Entry	Hissar	Coimbatore	Mysore	Samaru	Delhi	ISC Sadore	Pune	Jalna	ICRISAT Center	Aurangabad	Overall ^b mean
IOPE 13-6-27	0	0	4	91	11	1	84	6	0	28	22
IOPE 13-6-30	9	0	0	96	12	0	44	10	0	28	20
IOPE 34-1-10	2	0	0	3	0	0	1	1	0	4	1
IOPE 134-6-9	0	0	1	50	0	1	1	0	0	0	5
IOPE 134-6-11	0	0	0	28	0	2	0	0	9	1	4
IOPE 134-6-25	0	0	0	41	0	1	0	0	0	2	4
IOPE 134-6-34	2	4	0	66	0	0	1	0	3	0	6
IOPE 134-6-41	0	0	1	66	0	0	1	0	0	2	7
IOPE-1	0	0	0	92	2	0	34	6	4	27	17
IOPE-2	0	0	0	75	0	0	0	0	2	0	8
IOPE-6	0	0	0	33	0	2	11	0	0	9	5
IOPE-9	0	0	1	9	14	0	13	4	2	47	9
IOPE-11	2	0	0	29	11	1	10	1	4	31	9
IOPE-15	0	0	1	23	0	0	4	0	8	17	5
IOPE-16	0	0	0	3	0	0	9	1	1	6	2
IOPE-17	1	0	0	6	3	0	10	0	0	18	4
IOPE-22	2	0	0	4	5	1	20	0	0	12	4
IOPE-23	1	0	0	0	0	0	2	0	1	9	1
IOPE-24	0	0	0	0	0	1	11	0	0	4	1
IOPE-26	3	0	1	0	0	0	11	0	2	0	2
IOPE-27	0	0	0	3	0	0	8	0	0	16	3
IOPE-28	1	0	0	9	0	0	9	0	1	3	2
IOPE-31	0	0	0	0	4	0	4	1	0	7	2
IOPE-32	0	0	0	5	0	1	4	0	4	10	2
IOPE-33	0	0	0	79	0	0	6	0	3	2	9
IOPE-34	0	0	0	75	0	0	1	0	3	0	8
IOPE-37	0	0	0	65	0	1	1	0	0	0	7
700708-1-E-1	2	2	1	21	4	0	38	22	13	33	14
J 2238-2-E-4-1	0	2	0	3	0	0	0	0	10	0	1
Location mean ^c	1	<1	<1	36	2	<1	12	2	2	11	-
Local resistant	76	- ^d	0	3	39	2	5	42	8	0	19
Local susceptible	42	25	11	1	70	0	86	0	3	6	24
Trial Check (BJ 104)	57	5	0	37	0	1	17	0	34	1	15

^a Mean of 2 replications.^b Entry mean incidence (%) across locations.^c Location mean incidence (%) across entries.^d Data not provided

Table 17. Performance of the 14 IPMEN entries in 1981, 1982 and 1983 at one West African and 6 Indian locations

Sl. No.	Entry	Ergot Severity (%) ^b at																		
		Safaru		Aurangabad		Jamnagar		ICRISAT Center		Ludhiana		New Delhi		Mysore						
1982 1983		1981 1982 1983		1981 1982 1983		1981 1982 1983		1981 1982 1983		1981 1982 1983		1981 1982 1983								
ICPE ^a	134-6-9	<1	<1	1	<1	<1	<1	0	<1	<1	<1	5	<1	1	1	2	0	<1	<1	
ICPE	134-6-11	<1	1	5	<1	<1	<1	<1	1	<1	2	<1	2	1	2	0	0	<1	0	
ICPE	134-6-41	<1	1	5	<1	<1	<1	<1	1	<1	1	<1	1	4	<1	<1	<1	<1	0	
ICPE	134-6-34	<1	1	2	1	1	<1	<1	1	<1	1	<1	5	1	2	<1	<1	<1	0	
ICPE	134-6-25	1	<1	1	1	<1	0	<1	<1	<1	3	<1	3	1	1	<1	<1	<1	0	
ICPE	13-6-27	6	<1	1	2	7	1	1	5	1	1	5	2	3	5	<1	1	<1	0	
ICPE	13-6-30	1	1	1	1	4	1	<1	3	2	2	7	<1	0	4	4	2	<1	1	
LOPES-1		1	0	1	1	-	1	2	-	2	1	-	1	3	-	1	1	-	1	0
LOPES-2		<1	1	2	1	-	0	<1	-	<1	<1	-	<1	2	-	3	0	-	<1	<1
LOPES-23		0	1	2	1	-	0	1	-	3	2	-	5	2	-	2	<1	-	1	0
LOPES-27		0	<1	1	1	-	0	<1	-	1	<1	-	<1	2	-	1	<1	-	3	0
LOPES-28		<1	<1	3	2	-	<1	1	-	7	1	-	<1	2	-	3	2	-	1	0
LOPES-32		1	1	4	16	-	<1	2	-	2	1	-	1	2	-	<1	1	-	1	1
Susceptible Check		83	89	97	91	41	58	44	99	98	90	67	65	66	63	23	52	-	33	62

^a ICPE(S) = ICRISAT millet pathology ergot resistant lines (sib-bulk).^b based on 20-40 inoculated inflorescences/entry in 2 replications.^c indicates entry not included.

Table 18. The 1983 IPMEN entries with multiple disease resistance across locations in India and West Africa

Entry	Ergot Sev. (%) ^a		Smut Sev. (%) ^b		DM Inc. (%) ^c	
	\bar{x}	range	\bar{x}	range	\bar{x}	range
IOMPES 34-1-10	4	<1-22	6	0-12	1	0-4
IOMPES 16	1	0-2	<1	0-1	2	0-9
IOMPES 23	1	0-2	<1	0-1	1	0-9
IOMPES 24	1	0-3	<1	0-1	1	0-11
IOMPES 26	<1	0-1	<1	0-1	2	0-11
IOMPES 28	1	0-2	<1	0-1	2	0-9
IOMPES 31	4	0-26	6	0-15	2	0-7
IOMPES 32	2	0-16	4	0-12	2	0-10
Susc. Check	65	1-94	62	32-82	24	5-86

^a Based on mean of 12 locations (Coimbatore, Mysore, ICRISAT Center, Aurangabad, Pune, Delhi, Hissar, Ludhiana, Durgapura, Jamnagar, Samaru & Sadore).

^b Based on mean of 5 locations (Hissar, Durgapura, Jamnagar, ICRISAT Center & Samaru).

^c Based on mean of 10 locations (Hissar, Coimbatore, Mysore, Samaru, Delhi, Sadore, Pune, Jamnagar, ICRISAT Center & Aurangabad).

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