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تونس

F 1

PROCEEDINGS

THIRD REGIONAL WHEAT WORKSHOP

- Durum Wheat Improvement
- Weed Control
- Crop Rotation with Annual Forage Legumes
- Seed

Tunis, Tunisia
APRIL 28-MAY 2, 1975

CONTENTS

Contents Contd.

Contents Contd.

12

Performance of Durum Varieties in the Regional Nurseries

J. P. Srivastava

Durum wheat is a very important winter cereal for the region as a whole and particularly in the rainfed areas of North Africa, Ethiopia, Italy, Cyprus, Turkey, Syria, Transcaucasian USSR, Lebanon, Jordan, Iraq, Afghanistan and India. Durums bring higher prices as compared to breadwheat varieties in local markets and there is a heavy demand for durum wheats from Southern Europe. Traditionally North Africa and many of the Middle East countries were the suppliers of durum wheats to Europe and thus durum cultivation constituted an important source of foreign exchange. However, continuing low yields coupled with increased domestic consumption have changed most of these countries from durum exporters to wheat importers.

Most durum varieties planted in the region are local cultivars traditionally adapted to survive unfavorable growing conditions characteristic of rainfed culture. They lack satisfactory resistance to diseases, yield potential and stability and do not respond well to fertilizers under high rainfall or irrigation. It is imperative for these countries to identify and grow improved durum varieties of high yield potential with wide adaptation and possessing desired grain quality.

In the early 1960's, several varieties developed in Italy were tested in the region and Capeiti 8 was identified as high-yielding and well adapted in many countries. Since the late sixties, CIMMYT derived durum germplasm has been introduced into this region through CIMMYT and Regional Nurseries (ALAD-CIMMYT-FAO). A number of varieties, lines from CIMMYT material have been identified by the national programs for their

high yield potential and better adaptation to varying growing conditions. Jori 69 and Cocorit 71 have performed well under favorable growing conditions as well as under low rainfall areas where diseases are not a special problem. As a result these varieties are already occupying commercial acreage in countries like Lebanon, Turkey, Algeria, while in Syria, Jordan, Saudi Arabia and Egypt they are under large scale seed multiplication.

The FAO/IAEA/CNEN Near East Uniform Regional Trials of Radio Induced Durum Wheat Mutants has been carried out for several years in the region. Creso, Castel del Monte and GAB 125 have been identified as high yielding mutants from this program. These varieties are under test in the regional and national programs.

Summaries from CIMMYT and Regional Nurseries, grown in collaboration with national programs in the region for several years, identify new genotypes with high yield potential, good adaptation and better disease resistance than the indigenous varieties.

Table 1: Performance of some entries in the Third International Durum Yield Nursery (40 locations)

Variety or Cross	Origin	Yield t/ha	Test wt kg/hl
Cocorit 71	Mexico	4.3	76.2
Cajeme 71	Mexico	4.3	74.4
Crane 'S' (B)	Mexico	4.2	71.1
Cocorit 'S'	Mexico	4.2	77.9
Brant 'S'	Mexico	4.1	73.1
Crane 'S' (A)	Mexico	4.0	74.3
Jori 'S' x Crane 'S'	Mexico	3.9	71.8
Anhinga 'S'	Mexico	3.9	78.3
T. Dic. Var. Vernum	Mexico	3.8	69.2
Jori C-69	Mexico	3.8	75.9
Local check		3.8	70.0
Capeiti	Italy	3.6	77.3

In the Third Durum Yield Nursery, Cocorit 71 gave an average yield of 4.3 ton/ha (average of 40 locations) which was equal to the breadwheat check, Cajemi 71. These two varieties were closely followed by newer CIMMYT developed lines Crane 'S', Cocorit 'S', Brant 'S', Crane 'S' (A), Jori 'S' x Crane 'S' and Anhinga 'S'.

Table 2: Performance of some Durum entries in the First and Second Regional Rainfed Wheat Yield Trial (low fertility and rainfed conditions)

	1st RfWYT, 1972-73 12 locations			2nd RfWYT, 1973-74 18 locations		
	Mean yield kg/ha	Rank according to yield	Frequency in high yielding group *	Mean yield kg/ha	Rank according to yield	Frequency in high yielding group *
Capeiti	2,089	4	7	2,498	11	4
Jori 69	1,864	6	3			
Haurani	1,383	8	2	2,219	23	2
Senator Capelli	1,375	9	1			
Kyperounda	1,313	10	1			
Cocorit 'S'				2,938	2	12
Gerardo 572				2,769	5	7
Gerardo 512				2,681	6	7
Creso				2,471	12	2
Castel del Monte				2,349	21	0
Dw. Durum S-15				2,535	8	7
Breadwheat						
Super X	2,434	1	7	2,841	3	8
Sonalika	2,160	3	6	2,423	16	3

* Frequency of the variety appearing in the first significantly high yielding group

In the Regional Rainfed Wheat Yield Trials, Jori 69 and Cocorit 'S' have performed better than presently grown indigenous and improved durum varieties. However, the grain quality of both these varieties and particularly of Cocorit 'S' is inferior to

presently grown indigenous durum varieties. In addition, Capeiti 8, Gerardo 512 and Gerardo 572 gave good yields, fair adaptability and their grain quality is superior. As a class durums did not exhibit yield superiority over breadwheat variety Super X under rainfed conditions. Cocorit 'S', Gerardo 512, Gerardo 572 and Capeiti appear to be well adapted durum varieties. Table 3 shows average yield of some durum and breadwheat varieties in the third, fourth and fifth Regional Wheat Yield Trials grown under high production environment. On the whole breadwheats performed better under these conditions although Cocorit 71 exhibited the same production potential as Super X or Mexipak.

Table 3: Performance of Durum entries in the Third, Fourth and Fifth Regional Wheat Yield Trials (high fertility and high rainfall or irrigated conditions)

	Mean Yield in kg/ha and Varietal Ranking					
	3rd RWYT 1971-72 50 varieties 30 locations		4th RWYT 1972-73 25 varieties 14 locations		5th RWYT 1973-74 25 varieties 18 locations	
	Y	R	Y	R	Y	R
Durum						
Cocorit 71	4,074	16	4,359	7	4,662	4
Jori 69	3,776	29				
Pelicano			4,025	17		
Giorgio VZ 300	3,304	43				
Inrat 69	3,245	44				
Breadwheat						
Mexipak	4,265	6			4,534	9
Siete Cerros			4,473	3	4,647	5
Chenab 70	4,302	4	4,355	8		

The Third Preliminary Observation Nursery included 50 durum entries and data was summarized from 26 locations. Entry No. 12 CIT'S'-Gaviota 'S' CM9921-17m-0y and entry No. 18, Cr'S' x T. dic. S. Vernum-Gll'S CM199-29m-1y-1m-0y were reported to be

best entries from most of the cooperators, based on yield, resistance to rusts and plant type. The entries most frequently indentifield as superior lines are presented in Table 4.

Table 4: Best 10 Durum entries in Third Preliminary Observation Nursery, 1973-74

Entry No.	Designation	Ranked according to yield	Frequency of appearing in best 20 entries from 26 locations	YR	LR	CR
				Average coefficient of infection		
12	CIT'S'-Gaviota'S' CM9921-17-0y	4	17	2.1	15.8	12.7
16	Cr'S'xT. dic. S. Vernum-Gll'S' CM199-29m-1y-1m-0y	1	14	12.4	14.2	10.9
9	Maghrebi x H.O. CM9772-28m-0y	3	14	16.2	21.4	19.2
26	Gll'S'-Lds-RL3601/Jo'S' CM32929-8y-1m-1y-2m-0y	7	16	6.7	21.3	24.4
2	D. Dwarf S-15-Cr'S' D33312-7y-3m-1y-0m	5	15	17.6	27.3	5.2
3	D. Dwarf S-15-Cr'S' D33312-8y-4m-2y-0m	9	14	2.6	15.3	13.4
19	Cr'S'-Gs'S' CM224-1m-1y-4m-0y	8	13	5.2	23.0	18.4
29	AA'S'-Plc'S' D33041-16y-3m-2y-0m	2	10	28.7	10.6	20.6
27	21564-Cr'S' CM32929-8y-1m-1y-2m-0y	21	13	3.0	14.3	7.6
47	21563-Garza ID31534-3L-0L-1a-0a	34	7	3.0	10.8	4.6

Stork 'S' CM470-1m-3y-0m-0y and Jori 'S'-Cr'S' D27591-5m-3y-1m were identified for good yield and grain quality by several national programs and, consequently, they have been

included in the Sixth Regional Wheat Yield Trial for further evaluation.

In the Fourth Regional Disease and Insect Screening Nursery 400 durum varieties/lines were tested for disease resistance. Only 2 entries, RDISN No. 1989 Rabicorno CM31733-4m-2y-1m-0y and RDISN No. 2104, 21563x Jori'S' ID31538-1L-0L-1a-0a were found to possess good resistance to yellow and leaf rust and moderate resistance to stem rust. A number of lines have been identified for resistance to yellow and leaf rusts. None of the varieties exhibited high degree of resistance to stem rust. It is considered necessary to build germplasm with adequate resistance to three rusts to be used in crossing programs in the region.

More complete yield and disease reaction data is given in the appendix.

At this stage the national wheat programs in the region are devoting less attention to durum as compared to breadwheat programs. Durum Crossing Block from CIMMYT and a Regional Crossing Block constituted in Beirut from durum lines, found suitable in the region for yield, maturity, adaptation to low and high rainfall areas, superior grain quality and resistance to prevalent diseases in the region, are supplied to national programs for initiating their own hybridization program to cater to their specific environmental conditions. The following CIMMYT and Regional Durum Nurseries have been supplied to national programs in the region to accelerate their durum improvement program.

Table 5: Durum Germplasm Distributed in the Region through CIMMYT and Regional Nurseries 1974-75

Nursery	Number of Entries
International Durum Screening Nursery	240
Crossing Block	144
Segregating Populations (F_2)	
International Durum Yield Nursery	25
Elite Durum Yield Trial	25
Regional Disease & Insect Screening Nursery	600
Preliminary Observation Nursery	93
Regional Crossing Block	100
Rainfed Wheat Yield Trial	5
Regional Wheat Yield Trial	2

Gradually most of the national programs have started to expand their efforts in durum improvement programs. A number of high yielding lines with better yield stability and disease resistance than the local durum strains have been identified from the international nurseries. These may be used as a base to further improve them to suit the local requirements while maintaining their high yield potential. The International Durum Screening Nursery and the Preliminary Observation Nursery carry a wealth of germplasm with considerable variability and the individual programs may select the lines suitable for their specific requirements. Further selection pressure may be put by the national programs and their best selections may be recycled in the regional testing programs to obtain more information on disease resistance, yield stability, grain quality and other genotype by environment interactions which may be used as additional information in their decision making regarding the release of a variety in the country.

In the past few years there has been remarkable awareness of the possibilities of increasing durum production in the region. According to Borlaug, "despite present limitations, durums have probably the best yield potential among wheats". With accelerated national durum improvement programs in the region, coupled with the adoption of improved production technology and the availability of improved durum germplasm through the international and regional nurseries, increased yield potential of the durums can be exploited in the near future.

DISCUSSION

Question: How many countries in the Middle East and North Africa are growing the RDISN?

Answer:

1. Algeria	2. Tunisia	3. Egypt	4. Turkey
5. Lebanon	6. Jordan	7. Syria	8. Iran
9. Afghanistan	10. Pakistan		

Question: A variety may perform well at 80% of the locations but not at the remaining 20 percent of the locations. Should we not diversify the varieties and encourage other varieties in those areas?

Answer: There is considerable diversity of durum varieties in the region. Sometimes a variety is reported from a location as low yielding but this may be because of bird damage, poor soil or other factors and not necessarily an indication of the genetic yield potential. If the yield of a variety is high at 80 percent of the locations, it must possess high adaptability.

Comment: In Saudi Arabia we cannot distribute varieties which have good disease resistance in 80% of the locations but poor resistance in 20% of the locations. We always look with suspicion at a variety which shows disease susceptibility at any location. Low yield or adaptability may be ignored, but not disease.

APPENDIX

Performance of Durum Entries in the Third Preliminary Observation Nursery 1973-74 (Average of 26 locations)

Entry No.	Designation	Mean yield g/plot	Rank	Frequency of appearance in best 20 entries	YR	LR	SR
					Average coefficient of infection		
1	Jori	553	6	11	9.2	27.2	3.2
2	D. Dwarf S15-Cr'S' D33312-7y-3m-1y-0m	559	5	15	17.8	27.6	5.8
3	D. Dwarf S15-Cr'S' D33312-8y-4m-2y-0m	535	9	14	2.6	15.3	13.4
4	Jo'S'-Cr'S' D27591-5m-2y-1m	516	17	15	25.8	28.6	8.8
5	Jo'S'-Cr'S' D27591-5m-3y-1m	525	11	11	18.8	30.5	9.3
6	Gaviota'S' D31725-3m-8y-0m	477	31	11	19.3	31.0	28.9
7	21563-Jo'S' D31538-14m-3y-0m	481	30	13	16.5	18.8	10.2
8	21563-Gr'S' D31543-7m-2y-0m	490	25	7	15.6	24.8	18.8
9	Maghrebi x H.O. CM9772-28m-0y	568	3	14	16.2	21.4	19.2
10	Maghrebi 21563-AA'S' CM9776-50m-0y	517	16	9	20.6	22.8	21.7
11	Jo'S'-Cr'S'xGs'S'-AA'S' CM9902-5m-0y	524	12	10	19.4	17.6	10.0
12	CIT'S'-Gaviota'S' CM9921-17m-0y	561	4	17	2.1	15.8	12.7
13	(AA'S'(Cpe^3-Gz x Tc^3/ BY$_E^2$-Tc))Gs'S'-Gll'S' CM10165-14m-0y	452	39	9	18.2	15.3	6.2

APPENDIX

Entry No.	Designation	Mean yield g/plot	Rank	Frequency of appearance in best 20 entries	YR	LR	SE
14	Stv'63-Gl'S'xGs'S'-Cr'S' CM10251-A-2m-0y	511	20	11	22.7	16.2	9.3
15	CIP'S'-AA'S'xFg'S' CM10352-C-1m-0y	483	29	11	17.2	15.1	17.7
16	Cr'S'-Gr'S' CM2912-18y-6m-0y	501	24	10	10.6	28.0	20.7
17	Cr'S'-Gr'S' CM2912-27y-1m-0y	517	15	13	22.0	41.0	18.3
18	Cr'S'xT dic. Vernum-Gll'S' CM199-29m-1y-1m-0y	684	1	14	12.4	14.2	10.9
19	Cr'S'-Gs'S' CM224-1m-1y-4m-0y	540	8	16	5.2	23.0	13.4
20	Cocorit	521	13	9	5.9	8.6	5.6
21	Gerardo VZ469-Gr'S' CM362-21m-2y-1m-0y	476	33	7	18.6	16.6	16.8
22	Gerardo VZ469-AA'S' CM363-5m-4y-3m-0y	486	28	6	30.2	20.1	12.0
23	Gerardo VZ469-AA'S' CM363-5m-4y-5m-0y	477	32	9	31.0	13.4	10.2
24	Gerardo VZ469-Cr'S' CM365-30m-4y-1m-0y	508	23	11	22.7	21.5	2.1
25	Gerardo VZ469-Plc'S' CM373-3m-2y-1m-0y	525	10	16	19.7	17.8	11.9
26	Gll'S'-Lds-RL3601/Jo'S'	544	7	16	6.7	21.3	24.4
27	21564-Cr'S' CM32929-8y-1m-1y-2m-0y	511	21	12	3.0	14.3	7.6
28	Pelicano'S' D25609-1m-1y-2m-0y	486	26	8	27.0	9.1	5.3
29	AA'S'-Plc'S' D33041-16y-3m-2y-0m	592	2	10	28.7	10.6	20.6

APPENDIX

Entry No.	Designation	Mean yield g/plot	Rank	Frequency of appearance in best 20 entries	YR	LR	SR
30	Gaviota'S' D31725-6m-2y-2m-0y	439	45	2	17.8	31.0	4.0
31	Cr'S'-Gs'S' D28980-28y-13m-5y-1m-0y	451	40	11	22.2	17.3	15.7
32	BY^2E-Tc^2/Z-BxW D28232-3m-3y-1m-0y	467	36	8	2.8	22.9	11.0
33	Jori'S'(BY_E^2-Tc/Z-BxW D31453-7L-0L	442	44	9	14.0	40.3	38.3
34	67-144-64L-0L	433	46	5	23.2	33.4	8.3
35	Giorgio 447	445	42	7	15.0	10.4	19.8
36	Flamingo D27582-9m-8y-3m-500y	515	18	13	9.3	13.8	7.3
37	Pg'S'-31810 CM10071-45m-0y	513	19	9	17.0	14.6	1.4
38	Cr'S'(TAC_E-$Tc^4)^2$Z-BxW D28984-52y-1m-500y	466	37	9	13.8	14.4	3.2
39	HI-7597	327	49	3	69.3	7.6	2.3
40	Check Cocorit	463	38	10	18.8	21.6	2.2
41	HI-7527	292	50	1	75.2	16.0	5.8
42	HI-7720	403	47	2	47.8	0.0	8.3
43	Grulla-21564 ICM83-0L-5a-0a	521	14	11	11.4	27.5	2.0
44	Grulla-21564 ICM83-0L-6a-0a	447	41	5	2.0	27.6	20.3
45	USAIII-CxCrane'S' ICM532-0L-2a-0a	509	22	9	17.5	27.4	12.5
46	21563-Jori'S' ID31538-1L-0L-1a-0a	344	43	4	12.5	7.8	2.8

APPENDIX

Entry No.	Designation	Mean yield g/plot	Rank	Frequency of appearance in best 20 entries	YR	LR	SR
47	21563-Gerza ID31534-3L-0L-1a-0a	475	34	7	3.0	10.8	4.3
48	21563-(BYE-Tc, Z-BxW) ID31543-7L-0L-2a-0a	471	35	7	8.2	32.7	37.6
49	21563-(BYE-Tc^5) ID31544-1L-0L-1a-0a	486	27	8	4.7	24.8	3.1
50	Jori'S'/RD3-6xStw63 ID31563-1L-0L-2a-0a	392	48	7	12.1	19.9	4.9

APPENDIX

Performance of Durum Entries in the Third Preliminary Observation Nursery 1973-74

Frequency of Varieties appearing in the first 20 High Yielding Group out of 50 entries (data from 26 locations)

Entry No.	Variety	Frequency	Locations
1	Jori	11	Oman, Afghanistan, India(1) Sudan(1), Saudi Arabia, Jordan France(1), Spain(1), Lebanon(2) Syria, Egypt.
2	D. Dwarf S15-Cr'S' D33312-7y-3m-1y-0m	15	Lebanon(1), Greece, Iran, Spain(1) France(1), Iraq, Saudi Arabia, Nepal, Sudan(1), India(1), Oman, Lebanon(1), Mexico, Cyprus, Egypt
3	D. DwarfS15-Cr'S' D33312-8y-4m-2y-0m	14	Lebanon(2), Oman, Afghanistan, India(1), Nepal, Saudi Arabia, France(2), Spain(1), Spain(2), Greece, Lebanon(1), Mexico, Cyprus, Egypt.
4	Jo'S'-Cr'S' D27591-5m-2y-1m	15	Syria, Greece, France(1), Spain(2) Iraq, SaudiArabia, Sudan(2), Sudan(1), Afghanistan, India(1), Oman, Lebanon(2), Mexico, Cyprus, Egypt.
5	Jo'S'-Cr'S' D27591-5m-3y-1m	11	Lebanon(1), India(1), Afghanistan, Sudan(1), Sudan(2), Spain(1), Greece, Syria, Lebanon(2), Uganda, Egypt.
6	Gaviota'S' D31725-3m-8y-0m	11	Syria, Lebanon(2), Greece, France(1), France(2), Saudi Arabia, Sudan(1), Korea, Afghanistan, Lebanon(1), Egypt.
7	21563-Jo'S' D31538-14m-3y-0m	13	Korea, Nepal, India(1), Sudan(2), Saudi Arabia, France(1), France(2), Lebanon(2), Mexico, Cyprus, Uganda, Egypt, India(2).
8	21563-Gr'S' D31543-7m-2y-0m	7	Syria, Saudi Arabia, Sudan(2), Lebanon(1), Mexico, Cyprus, Egypt
9	Maghrebi - H.O. CM9772-28m-0y	14	Oman, Afghanistan, Sudan(1), India(1), Sudan(2), Saudi Arabia, Iran, Spain(1), Spain(2), France(2), Syria, Mexico, Cyprus, Egypt.

APPENDIX

Entry No.	Variety	Frequency	Locations
10	Maghrebi 21563-AA'S' CM9776-50m-0y	9	France(1), France(2), Iran, Sudan(1), Korea, Afghanistan, India(1), Uganda Egypt.
11	Jo'S'-Cr'S'xGs'S'-AA'S' CM9902-5m-0y	10	Nepal, India(1), Korea, Afghanistan, Sudan(2), Iraq, Saudi Arabia, France(1), Spain(2), Egypt.
12	CIT'S'-Gaviota'S' CM9921-17m-0y	17	Syria, France(1), Greece, France(2), Spain(2), Iraq, Saudi Arabia, Sudan(1), Sudan(2), Lebanon(1), India(1), Nepal, Mexico, Cyprus, Egypt, India(2).
13	(AA'S'(Cpe^3-GzxTc^3/ BY$_E^2$-Tc))Gs'S'-Gll'S' CM10165-14m-0y		India(1), Korea, Iraq, Spain(1), Lebanon(2), Saudi Arabia, Mexico, Cyprus, Egypt.
14	Stw63-Gr'S'xGs'S'-Cr'S' CM10251-A-2m-0y	11	Lebanon(2), Syria, Greece, Spain(2), Iraq, Jordan, Oman, Afghanistan, Mexico, Cyprus, Egypt.
15	CIT'S'-AA'S'xFg'S' CM10352-C-1m-0y	11	Nepal, Korea, Afghanistan, Lebanon(1), Sudan(2), Sudan(1), Iraq, Iran, Greece, Egypt, India(2).
16	Cr'S'-Gr'S' CM2912-18y-6m-0y	10	Syria, France(1), Spain(2), Iran, Iraq, Sudan(2), Sudan(1), Lebanon(1), Korea, Egypt.
17	Cr'S'-Gr'S' CM2912-27y-1m-0y	13	Nepal, Oman, Sudan(2), Sudan(1), Jordan, Iran, France(1), Spain(1), Spain(2), Lebanon(2), Mexico, Cyprus, Egypt.
18	Cr'S'xT. dic. S. Vernum-Gll'S' CM199-29m-1y-1m-0y	14	Syria, Greece, France(2), Spain(2), Iran, Iraq, Sudan(2), Sudan(1), Oman, Lebanon(1), Korea, India(1), Nepal, Egypt.
19	Cr'S'-Gs'S' CM224-1m-1y-4m-0y	16	Bangladesh, Nepal, Oman, Lebanon(1), Sudan(2), Sudan(1), Iraq, Jordan, Greece, France(1), Spain(2), Syria, Mexico, Cyprus, Egypt, India(2).
20	Cocorit	9	Syria, Greece, France(1), Iraq, Bangladesh, Korea, Mexico, Cyprus, India(2).

APPENDIX

Entry No.	Variety	Frequency	Location
21	Gerardo VZ469-Gr'S' CM362-21m-2y-1m-0y	7	Iraq, Greece, France(1), Mexico, Cyprus, Egypt, India(2).
22	Gerardo VZ469-AA'S' CM363-5m-4y-3m-0y	6	Syria, Spain(2), Greece, France(1), Lebanon(1), Egypt.
23	Gerardo VZ469-AA'S' CM363-5m-4y-5m-0y	9	Korea, Nepal, Oman, Sudan(1), Sudan(2), Jordan, Greece, France(1), Egypt.
24	Gerardo VZ469-Cr'S' CM366-30m-4y-1m-0y	11	Spain(1), Spain(2), France(2), France(1), Jordan, Sudan(1), Afghanistan, India(1), Mexico, Cyprus, Egypt.
25	Gerardo VZ469-Plc'S' CM373-3m-2y-1m-0y	13	Afghanistan, Korea, Bangladesh, India(1), Lebanon(1), Sudan(1), Sudan(2), Spain(1), Greece, France(1) Syria, Mexico, Cyprus, Uganda, Egypt, India(2).
26	Gll'S'-Lds-RL3601/Jo'S' CM429-8m-3y-1m-0y	16	Syria, Greece, Spain(1), Spain(2), France(2), Iran, Iraq, Jordan, Oman, Korea, Afghanistan, Bangladesh, Sudan(2), Cyprus, Egypt.
27	21564-Cr'S' CM32929-8y-1m-1y-2m-0y	12	Sudan(2), Korea, India(1), Bangladesh, Jordan, Iran, Spain(1), Spain(2), Greece, Mexico, Cyprus, Egypt, India(2).
28	Pelicano'S' D25609-1m-1y-2m-0y	3	Bangladesh, India(1), Sudan(2), Jordan, Iran, Spain(2), Spain(1), France(2).
29	AA'S'-Plc'S' D33041-15y-3m-2y-0m	10	Spain(2), Spain(1), France(2), Greece, Saudi Arabia, Sudan(2), Nepal, India(1), Korea, Bangladesh.
30	Gaviota'S' D31725-6m-2y-2m-0y	2	Korea, Greece
31	Cr'S'-Gs'S' D28980-28y-13m-5y-1m-0y	11	Lebanon(2), France(2), Iran, India(1), Nepal, Bangladesh, Mexico, Cyprus, Uganda, Egypt, India(2).
32	BY^2E-Tc^2/Z-BxW D22232-3m-3y-1m-0y	8	Nepal, Saudi Arabia, Jordan, France(1), Spain(1), Oman, Egypt, India(2)

APPENDIX

Entry No.	Variety	Frequency	Location
33	Jori'S' $(BY_E^2$-Tc/Z-BxW) D31543-7L-0L	9	France(1), Jordan, Iraq, Saudi Arabia, Bangladesh, Mexico, Cyprus, Uganda, Egypt.
34	67-144-64L-0L	5	Bangladesh, Nepal, Saudi Arabia, Iran, France(2).
35	Giorgio 447	7	Bangladesh, Afghanistan, Korea, Lebanon(2), France(2), Iran, Nepal.
36	Flamingo D27552-9m-8y-3m-500y	13	Bangladesh, Afghanistan, Nepal, Sudan(1), Jordan, Iraq, Iran, Oman, Spain(1), Spain(2), Syria, Egypt, India(2).
37	Pg'S'-31810 CM10071-45m-0y	9	Syria, Oman, France(2), Spain(2), Iran, Saudi Arabia, Sudan(2), Nepal, Egypt.
38	Cr'S $(TAC_E$-$Tc^4)^2$Z-BxW D28964-52y-1m-500y	9	Korea, Iran, Oman, France(1), Syria, Mexico, Cyprus, Egypt, India(2).
39	HI-7597	3	Lebanon(1), Iraq, Bangladesh.
40	Check - Cocorit	10	Korea, Afghanistan, Iran, France(1) Spain(1), France(2), Mexico, Cyprus, Egypt.
41	HI7572	1	Lebanon(1)
42	HI-7720	2	Lebanon(1), Oman.
43	Grulla-21564 ICM83-0L-5a-0a	11	Syria, Oman, Lebanon(1), France(2), Spain(2), Iran, Saudi Arabia, Jordan, Afghanistan, Bangladesh, Kenya.
44	Grulla-21564 ICM83-0L-5a-0a	5	Afghanistan, Bangladesh, Lebanon(1), Spain(1), Mexico, Cyprus.
45	USAIII-CxCrane'S' ICM532-0L-2a-0a	9	Lebanon(1), Greece, Spain(1), Spain(2), France(2), Bangladesh, Nepal, Mexico, Cyprus.
46	21563-Jori'S' ID31538-1L-0L-1a-0a	4	Jordan, Saudi Arabia, Mexico, Cyprus.

APPENDIX

Performance of Breadwheat and Durum Entries in the 2nd Rainfed Wheat Yield Trial 1973-74
Grain Yield in kg/ha and Varietal Ranking

Variety / Cross	Origin	Species	Middle East		South East		Africa		Europe		Overall Locations		Frequency in 1st high yielding group *
			Y	R	Y	R	Y	R	Y	R	Y	R	
1. Sabar Bek	Iraq	B, W	1548	25	866	25	585	25	1206	25	1302	25	0
2. Houreni	Syria	Durum	2032	15	2178	15	2275	22	2521	21	2219	23	2
3. Capeiti 8	Italy	Durum	2227	8	2211	13	2684	18	3031	13	2498	11	4
4. Giorgio 447	Italy	Durum	2078	14	2553	3	2657	19	3126	12	2513	10	3
5. Giorgio 532	Italy	Durum	1957	18	2209	14	2209	14	2947	14	2368	20	1
6. Gerardo 512	Italy	Durum	2030	16	2331	9	3292	11	3689	3	2681	6	7
7. Gerardo 572	Italy	Durum	2137	10	2394	7	3438	6	3736	2	2769	5	7
8. Gerardo 598	Italy	Durum	1936	17	2334	8	3327	10	3537	7	2625	7	3
9. Creso	Italy	Durum	1774	23	2145	16	3629	2	3319	10	2471	12	2
10. Castel Nuovo	Italy	Durum	2105	12	2252	10	2863	16	2914	17	2438	15	5
11. Castel del Monte	Italy	Durum	1891	21	2215	12	2960	13	2920	16	2349	21	0
12. FD-1024	Italy	Durum	2123	11	2114	17	2869	15	2963	15	2440	14	2
13. FD-1608	Italy	Durum	1913	20	2015	19	3228	9	3377	9	2520	19	2
14. FD-2302	Italy	Durum	1785	22	1977	20	2900	14	3408	8	2392	17	4
15. Maristella	Italy	Durum	2184	9	1915	23	2328	8	2869	13	2345	22	3
16. Cocorit 'S'	Mexico	Durum	2385	4	2728	2	3777	1	3614	4	2938	2	12

APPENDIX

Continued

Variety / Cross	Origin	Species	Middle East		South East		Africa		Europe		Overall Locations		Frequency in 1st high yielding group *
			Y	R	Y	R	Y	R	Y	R	Y	R	
17. Najah	Lebanon	BW	2420	3	1942	22	2649	20	2490	24	2385	18	7
18. Sw. Durum 5-15	Mexico	Durum	2275	6	2437	5	3518	4	2618	22	2535	8	7
19. Sonalika	India	BW	2095	13	2533	4	2979	12	2659	20	2423	16	3
20. Pitic 62	Mexico	BW	2464	2	2437	6	3619	3	3864	1	2977	1	12
21. P.106-19	Lebanon	BW	2525	1	2220	11	3469	5	3214	11	2770	4	8
22. Super X	Mexico	BW	2244	7	2844	1	3418	7	3582	5	2841	3	8
23. SA 42	Pakistan	BW	2369	5	2106	18	1733	24	2808	19	2376	19	6
24. Kyperounda	Cyprus	Durum	1753	24	1812	24	2324	22	2504	23	2035	24	0
25. Local check			1952	19	1946	21	2494	21	3579	6	2463	13	4

* Frequency of the variety appearing in the first significantly high yielding group out of 18 locations

Y - Average yield in kg/ha

R - Average rank on the basis of yield out of 25 varieties

APPENDIX

Multiple Disease Resistance
Durum Wheat

Below are durum (T. durum) varieties and lines in the 4th RDISN with a maximum average coefficient of rust infection to the rusts of YR = 5.0, LR = 5.0, SR = 20.0 *

RDISN No.	Variety/Cross Pedigree	YR ACI	YR HS	LR ACI	LR HS	SR ACI	SR HS	Source
Groupings 1 *								
1989	AA'S'(CpE^3-GzxTc^3/ BY$_{E_2}$-Tc) 31733-4m-3y-1m-0y	3.0	10S	2.4	5S	18.7	40S	4 RCB 26
2104	21563-Jori'S' ID31538-1L-0L-1a-0a	1.4	5MS	0.5	TrS	20.0	20S	3 PON 46
1856	Jo'S'(Gll'S'/61-130x60-115) D-32364-7Y-2m-2y-4m-0y	1.3	5S	4.0	40R	30.7	70S	5 IDSN 56
1908	Plc'S'-Cr'S'(Z-B. LKx 60-120/Gll'S') CM-13414-1y-2m-0y	2.6	10S	4.4	15MR -5S	43.3	70S	108
1909	Plc'S'-Cr'S'-(Z-B. LKx 60-120/Gll'S') CM-13414-1y-3m-0y	2.6	5S	4.7	40 MR	30.0	80S	109
1979	Mohammed Ben Bachir	2.5	5S	4.1	10S	73.3	80S	4 RCB 16
2069	Jo'S'-Cr'S'xGs'S'-AA'S' CM-9902-5m-0y	1.8	5S	4.4	15MR -10S	30.0	50S	3 PON 11
2214	USA III-CX Cr'S' ICM532-0L-2a-0a	3.0	10S	3.0	15 MR	26.6	40S	Tun. Sel. 18
2215	USA III-CX Cr'S' ICM532-0L-6a-0a	3.0	10S	1.7	5S	26.1	40S	Tun. Sel. 19
2216	61-130xLdsxGll/ Ganso'S' OC. 547-0L-4a-0a	3.0	10S	1.7	5S	21.7	40S	Tun. Sel. 20
2221	IDSN 046	3.0	10S	3.1	10MS	72.5	80S	Tun. Sel. 24
2258	D68-5-3b-4a	1.3	5S	3.5	15MR -5S	28.0	50S	Tun. Sel. 60

APPENDIX

RDISN No.	Variety/Cross Pedigree	YR ACI	YR HS	LR ACI	LR HS	SR ACI	SR HS	Source
Groupings 3								
1881	P66/253-Fg'S'xPg'S' Cit-71 CM18040-A-2m-0y	3.0	10S	20.2	30S	11.0	20S	5 IDNS 81
2107	21563-(BYE-Tc^{5}) ID3154-1L-0L-1a-0a	2.0	5S	20.6	60S	14.0	40S	3 FCN 49
2108	Jori'S'/RD3-6xStw63 ID31563-4L-0L-2a-0a	0.0	0S	24.8	60S	16.1	40S	50
2109	Grulla-2a564 ICM83-0L-5a-0a	2.0	5S	14.1	40S	18.0	60S	Cyprus Sel.
Groupings 4								
1893	Chap-21563xCr'S' CM-12857-16y-1m-0y	35.5	80S	4.0	40MR	12.5	40S	5 IDSN 93
1972	Jori 69-BY$_{E}^{2}$-Tc x TAC$_{E}$-Tc^{3} 21570-9m-6r-1m	6.4	20S	4.8	20MS	17.5	60S	4 RCB 9
1983	Maghrebi 72-Gll(Br.180 xLak/Gz-220x61-130 26842-21y-3m-0y	12.3	40S	3.5	20MR	20.0	40S	88
2021	Flamingo 'S' 27582-8m-13y-2m-0y	3.4	10S	4.0	40R	12.5	40S	87
2037	AA((Tg1$_{E}^{2}$-Pli)xRamifield Source)S34-3L	8.0	30S	4.6	40R	20.0	40S	74
2247	D68-4-21a-8a	5.0	10S	3.2	15MR -5S	13.7	40S	Tun. Sel. 49

* Groupings 1 - 3R - satisfies selection criteria for the 3 rusts
2 - YR LR - leaf & yellow rusts
3 - YR SR - yellow & stem rust
4 - LR SR - leaf and stem rust

RENDEMENT DES VARIETES DE BLE DUR DE LA RECION

J. P. Srivastava

RESUME:

La plupart des variétés de blé dur cultivées dans la région sont d'origine locale et sont naturellement adaptées aux conditions de culture en sec, peu favorable à la culture du blé. Leur résistance aux maladies et leur potentiel de rendement ne sont pas satisfaisants et elles ne réagissent pas bien aux engrais en cas de fortes pluies ou d'irrigation.

Au début des années 60, plusieurs variétés développées en Italie ont été testées dans la région et l'on a constaté que le Capeiti 8 avait un rendement élevé et s'adaptait bien dans de nombreux pays. Depuis plusieurs années, FAO/IAEA/CNEN (Comité National Italien pour l'Energie Nucléaire), poursuivent leur programme de recherche visant à produire, sur le blé dur, des mutations induites par l'énergie nucléaire et à tester ces lignées dans la région du Moyen-Orient. On a constaté que le Castel del Monte, le GAB125 et le Creso sont les variétés à haut rendement les plus prometteuses issues de ce programme.

Depuis la fin des années 60, le germoplasme du blé dur provenant de CIMMYT a été diffusé dans la région à partir des pépinières de CIMMYT et des pépinières régionales (ALAD-CIMMYT-FAO). Les programmes nationaux ont identifié des variétés/lignées provenant de CIMMYT ayant un potentiel de rendement élevé et une meilleure faculté d'adaptation. Le Jori 69 et le Cocorit 71 ont donné de bons résultats dans des conditions de croissance favorables de même que dans des régions à faible précipitations où les maladies ne posent pas de problème particulier. En conséquence, ces variétés sont déjà cultivées au Liban, en Turquie, en Algérie alors qu'en Syrie, en Jordanie, en Arabie Séoudite et en Egypte, les semences de ces variétés sont en cours de multiplication.

De nouvelles lignées telles que le Crane 'S', le Brant 'S', le Jori 'S'x Crane 'S' ont donné les meilleurs rendements dans la Troisième Pépinière Internationale de Rendement du Blé Dur. Dans la Pépinière "Essais de Rendement du Blé Cultivé en Sec" le Jori 69, le Cocorit 71, le Capeiti 8, le Gerardo 512 et le Gerardo 572 donnent de bons rendements et font preuve d'une bonne adaptabilité. Les lignées CIT 'S'-Gaviota 'S', T.dic.S.vernum-G11'S', le Stork 'S' Jori 'S'-Cr'S', AA'S' (CPE^3-GzxTc/BY_ETc et 21563xJori'S' sont quelques uns des bons génotypes identifiés par les programmes nationaux dans les pépinières régionales et celles du CIMMYT.

Des lignées présentant une résistance aux maladies et identifiées dans les Pépinières "Insectes et les Maladies Régionales", ont été mises à la disposition des programmes nationaux pour être utilisées dans leur programme d'hybridation. Du germoplasme très diversifié de blé dur a été distribué dans la région pour faire face aux besoins des différents programmes génétiques. Plusieurs pays ont identifié des lignées de blé dur ayant un potentiel de rendement et une résistance aux maladies supérieurs et sont en train de les multiplier pour accroître la disponibilité de ces semences.

Original: Anglais

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