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CIMMYT REPORT - ALGERIA 1971-72

I. INTRODUCTION

A Cereal Research and Production Project was established during the summer 1971 between the Algerian Ministry of Agriculture and CIMMYT; The CIMMYT program in Algeria is supported by the Ford Foundation. Other cooperating agencies are F.A.O. and C.C.C.E. (French Central Economic Agency of Cooperation) directing extension demonstrations, fertilizer distribution and pilot studies respectively. The breeding program is directly connected to I.N.R.A.A. (National Institute of Agricultural Research for Algeria) at 7 central and branch stations throughout the cereal growing regions of northern Algeria. CIMMYT production research during 1971 was divided into two large regions of east and west. The country will be divided into three production regions (eastern, central and western) during the 1972-73 season with centers in Constantine, Algiers and Oran.

The Government of Algeria had imported sufficient seed of Mexican varieties during 1969-70 and 1970-71 to plant 5,100 and 148,000 hectares respectively. Based on the success of the introduced varieties, Inia, Siete Cerros and Tobari, Algeria seeded more than 320,000 hectares of high yielding varieties during 1971-72. All but a few percent of this surface consisted of the three Mexican varieties and Strampelli, a promising Italian bread wheat. The projected total surface for 1972-73 season is more than 600,000 hectares. Included in this total are 86,000 hectares of the Mexican durum variety Jori 69 and 3,000 hectares of two Italian durum varieties Capeiti and Montanari.

Results of the 1971-72 season were very satisfactory throughout the country owinf to favorable climatic conditions, availibility of fertilizer and goo support by the local government.

II. WEATHER CONDITIONS

General and abnormally high total rainfall and very good seasonal distribution contributed to the successful wheat year as shown in the following table.

COMPARISON OF 1971-72 RAINFALL WITH THE 50 YEAR AVERAGE

1971-72 TOTAL IS FOR PERIOD OCTOLER 1971 TO JUNE 1972.

REGIONS	ALTITUDE (METERS)	1913-63 AVERAGE (MM)	TOTAL 1971-72 (MM)
EASTERN			
Annaba	58	674	
Constantine	660	523	748
El Khroub	640	531	785
Guelma	270	609	714
Sétif	1081	457	611
CENTER			
Algiers (University)	59	753	930
Médéa	912	826	1137
El Asnam	112	396	
WESTERN			
Oran (Port)	3	381	
Mostaganem	111	425	438
Reliazane	80	342	388
Mascara	583	456	616
Tlemcen	810	688	760
Maghnia	399	392	413
Sidi-Bel-Abbès	486	414	485

Yield of cereals benefited from the high rainfall more than losses observed due to excessive moisture during certain periods in specific regions. Prolonged cool, cloudy days and rainy periods hindered timely application and the efficacy of chemical weed control. These conditions also affected timely application of nitrogen top-dressing. Losses also occurred from flooding in lowland areas.

Cold weather with snow and late frost caused sterility of early maturing varieties in many areas above 500 meters altitude. The cool spring temperatures with accompanying above normal rainfall aided the late maturity. Losses from hot southerly winds (Siroccos) were minimal compared to other years.

III. DISEASES AND INSECTS

Weather conditions were optimum for development of Septoria tritici. However, losses were restricted mainly to the higher rainfall coastal plains. Puccinia graminus tritici was generally observed across the coastal plains and the Sétif region on the high plateau. The susceptible local bread and durum wheat varieties and the Italian introductions were heavily infected. In regions where these varieties matured late, the rust developed early enough to cause considerable losses.

Puccinia recondita and Puccinia glumarum were also observed. The duration and intensity of these diseases was not enough to cause appreciable loss in yield.

The high yielding Mexican varieties, Inia Tobari and to a lesser degree, Siete Cerros were resistant to the three types of rusts in Algeria. New introductions from Tunisia, Soltane, Zaafrane and Utique also were resistant. Jori 69 developed moderate levels of stem rust. Cocorit 71 also developed some stem rust infection on the summer planting.

Insects were a minor factor in production. Isolated areas had considerable damage from cut worms. Hessian fly damage was limited to isolated areas and caused very little yield reduction.

In certain regions, early maturing fields of the Mexican varieties suffered from bird damage. This is a universal problem throughout North Africa.

IV. FERTILIZATION AND WEED CONTROL

Based on research and experience in Algeria and other countries of North Africa, fertilizer recommendations were made for the different rainfall regions. These objectives were as follows.

RAINFALL ZONE	NITROGEN RECOMMENDATION			PHOSPHATE RECOMMENDATION
	BEFORE SEEDING	TILLERING	TOTAL	
400mm	33	22	55	45
400-500mm	45	22	67	45
500-600mm	45	33	78	45
600mm	45	45	90	90

The figures are in units of N and P_2O_5 per hectare.

A large percentage of the 320,000 hectares were covered with the recommended rates for nitrogen and phosphorus. Full efficiency from the fertilizer was not realized for several reasons. Some areas did not have the full application due to lack of equipment and wet weather prohibiting application with equipment. Poor weather conditions also prevented realizing the 200,000 hectares programmed for aerial application. Late and often uneven hand application also reduced the overall yield benefits from the nitrogen application.

The Government recommended and distributed sufficient phosphate fertilizer to apply 45 units/hectare to the more tham 2,000,000 hectares of commercial wheat production. Sufficient nitrogen fertilizer was distributed to generally apply 20 units/hectare over the total areas of wheat peoduction.

Weed control with herbicides was used on less than half of the high yielding varieties. Lack of chemicals, equipment and poor weather conditions for treatment, all contributed to this problem. Aerial application was hindered by poor weather and only a part of the planned program was completed.

Results from application were spotty. Poor equipment, late application and improper use of some chemicals reduced the overall effectiveness of the application. Good weed control was reported to have doubled yield.

Wild oats, rye grass and Phalaris sp caused considerable losses, in many regions. Chemicals used were not effective on these grass type weeds. Oxalis spp are also a major weed problem throughout the fruit tree and vine areas where cereals occur.

V. PRODUCTION

Although final production figures for the 1971-72 season are not complete, indications from over half of the production regions show the average yield of the three Mexican varieties to be 15 to 18 quintals/hectare. This compares with a 10 quintals/hectare average of the local bread and durum wheat varieties in the same regions.

On a small area of production, the Italian variety Strampelli also yielded about 17 quintals/hectare.

Several factors reduced the harvested yield for all varieties. The limiting factors of diseases and weeds to production have been previously reported. In addition to these factors, high losses occurred at harvest. Harvest was delayed by lack of combines. The high yielding varieties matured early and were ready to harvest while the harvest of barley and other crops was still in progress Much of the wheat stood in the field for two to four weeks after it was ready for harvest. High losses from wind shattering and late rain were common. It is difficult to estimate these losses but 10 to 15 percent over all loss is indicated. In general, losses from harvest probably were higher in the early maturing varieties because of the relatively longer period of standing after ripening.

The production of well managed fields indicates the potential of the high yielding varieties. Many fields produced 40 quintals per hectare with a few yields approaching 6 tons per hectare.

VI. PRODUCTION RESEARCH

Variety demonstrations were planted in sixteen locations in 1971-72. Ten demonstrations were planted in the western region and six were planted in central and eastern regions. In general, these demonstrations consisted of 18 varieties with two replications. The demonstrations were fertilised at the recommended rate and were sprayed with chemical herbicides. Farmers equipment were used for seeding and harvesting. Not all varieties were planted at each location, and a total of 24 different varieties were planted. Three demonstrations were not harvested due to flooding, heavy infestation of rye grass and damage from cut worms.

The data are summarized in the following table (Table I).

Siete Cerros had the highest average yield at all locations even through the yield was reduced by Septoria in a few locations. Yield loss at the Annaba location was estimated at 30 % when compared to the resistant variety Strampelli.

All demonstrations were seeded after December 20. Although yields of the earlier varieties were not affected by the later seeding, the late varieties may have suffered some yield loss.

Strampelli was the highest yielding Italian variety and was equal to Siete Cerros in the high plateau region. These two varieties were the best adapted to the high plateau. The other Italian varieties performed well in the high plateau regions but were low producers in general in the other regions. The Italian varieties were all susceptible to stem rust, but Strampelli was attacked later and with less intensity. Strampelli is very susceptible to saw fly damage. Siete Cerros was the most tolerant of the high yielding varieties to saw fly attack. Saw fly was most prevalent in the high plateau where both Siete Cerros and Strampelli are recommended.

AVERAGE YIELD, COMPARATIVE YIELD IN PARCENT ON INIA AND MAXIMUM DISEASE AND INSECT READINGS FOR VARIETIES IN 13 DEMONSTRATIONS THROUGHOUT ALGERIA

VARIETY	LOCATIONS NUMBER	SOURCE	Q/H YIELD	YIELD % OF INIA	SEPTORIA RATINGS	MAXIMUM READINGS STEM RUST	% DAMAGE SAW FLY	% LODGING	% SHATTERING
Siete Cerros	12	Mexico	32.3	117	9	R	2	5	0
Laafrane	7	Tunisia	26.3	116	7	R	10	10	2
Beltane	13	Tunisia	30.2	113	7	R	5	2	0
Mexico 1601	3	Mexico	46.3	112	5	R	5	-	-
Strampelli	13	Italy	29.7	111	3	S	25	5	0
Utique	11	Tunisia	26.1	108	5	R	5	10	5
Tobari 66	12	Mexico	27.8	106	8	R	5	2	0
Generoso	9	Italy	22.1	106	3	S	10	0	5
Fletcher	3	U.S.A.	29.7	103	2	R	5	0	0
Capeiti (I)	5	Italy	29.9	103	-	S	L	S	-
Inia 66	13	Mexico	26.7	100	9	R	10	5	0
Imrat 69 (D)	13	Tunisia	25.6	96	8	T-R	10	50	0
Moh.Ben Lachir (D)	9	Algeria	23.6	96	-	S	10	S	-
Jori 69 (D)	8	Mexico	25.5	93	9	R	3	0	0
Sparta	12	Italy	25.9	90	3	VHS	5	5	10
Mahon Derias	9	Algeria	21.4	87	-	S	5	S	10
Padre Jemelli	11	Italy	20.8	85	3	VHS	10	0	5
Libellula (D)	11	Italy	23.0	84	2	VHS	5	0	2
Oued Zenati 368 (D)	11	Algeria	21.6	84	9	S	-	95	0
Montemari (D)	3	Italy	26.0	79	-	S	-	S	-
Splendeur	13	France	14.4	54	2	VHS	5	0	0

NOTE : L = Light attack; R = Resistant; S = Susceptible; VHS = Very Highly Susceptible ; (-) = no comparative reading.

The varieties Soltane, Zaafrane, Utique from Tunisia and Calidad sib(Mex.1601) performed well. Soltane appears to be the best adapted of the varieties with better performance in the high plateau. It should be recommended for the higher rainfall areas. Utique and Mexico 1601 performed very well in the high rainfall areas where Septoria was a factor, but were too early for the high plateau region.

Fletcher was outstanding in resistance to diseases, but was too late for the later seeding. Both Fletcher and Era need to be tried in earlier seedings to help over come the late maturity.

Inia 66 and Tobari were not outstanding this year. Neither variety tillered very well this season, andthey lack adaptation to the high plateau, although Tobari appears to be some better in this area. Tobari performed quite well in the high rainfall region and in the one irrigated trial that was late seeded. Until Tobari can be replaced by Soltane, Utique or another new variety, it is the best variety for the high rainfall coastal region.

Of the durum varieties, Inrat 69, Capeiti and Jori appear to have the most potential of the varieties in the demonstrations. Jori is not adapted to the high plateau and should not be used in the high rainfall areas. The best region of adaptation is the 400-500mm region below 800 meters. Capeiti is better adapted to the higher rainfall areas, but will lodge. Inrat 69 is adapted to both the high and intermediate rainfall areas, but it has not performed well on the high plateau. Mohamed Ben Bachir performed very well in the high plateau, but is too weak strawed to be used in the higher rainfall regions. In other tests, Cocorit 71 and other new high yielding durum varieties appear to be much superior to the varieties now grow. Some of these are included in demonstrations for the 1972-73 season.

Maximum yield obtained in the demonstrations was 61.6 quintals at Baraki (Algiers) with Penjamo. Siete Cerros yielded 60.4 at this location . Under irrigation, Tobari produced the maximum yield at 57.5 quintals/ hectare.

Three dates of seeding trials were established in eastern Algeria. One of these trials was abandoned due to cut worm damage. Four varieties were planted with two dates of seeding in the high plateau region near Sétif.

There was no significant difference in yield between the two dates of seeding or a significant variety-date inter-action. There was a significant variety difference in yield. The cool spring and good rainfall distribution probably accounted for lack of seeding response.

TABLE II

YIELD OF FOUR VARIETIES AT TWO DATES OF SEEDING AND TWO LOCATIONS IN THE HIGH PLATEAU

VARIETY	YIELD Q/H SETIF SOUTH			SETIF NORTH		
	NOV.25	DEC.20	AVE	NOV.25	DEC.19	AVE
Inia	21.6	24.1	22.9*	624.4	23.6	24.0
Strampelli	23.5	26.1	24.8*	26.9	29.5	28.2*
Siete Cerros	23.9	24.1	24.0*	28.8	28.9	28.9*
Mahon Damias	18.0	16.4	17.2	23.9	21.1	22.5
L.S.D. 5%			3.52			5.64

* Significantly higher yielding than Mahon Demias.

Four fertilizer trials were established in eastern Algeria. One trial was destroyed by cut worms. There was a significant response to nitrogen at two locations. The response was related to previous cropping hi history as has been the case in trials in Tunisia and Morocco. The response was limited to 44 units of N at Guelma following sugar beets with a very high check indicating indicating a high carry over of N from the previous crop. At Annaba following vatch harvested for seed, a response was noted at all levels of N to 132 units. These results are shown in Table III.

At Sétif following summer follow no significant yield response was noted. The data from this trial are not included because faulty second application did not allow analysis of the data.

TABLE III

SUMMARY OF YIELD RESPONSE TO NITROGEN TREATMENT AT TWO LOCATIONS

LOCATION	PRECEEDING CROP	UNITS OF NITROGEN YIELD Q/H 0	44	88	132	DIFFERENCE	% INCREAS
Guelma	Sugar beet	36.1	44.1	45.0	46.4	10.3	28
Annaba	Vetch (seed)	23.5	37.7	43.5	51.4	27.9	115
	L.S.D. Annaba	6.82 Q/H					
	Guelma	4.79 Q/H					

The average yields are determined from 12 plots foe each rate of N. There was no difference between dates of application or if the application was split.

VII. INPROVEMENT SECTION

The good moisture distribution and cool, cloudy days prolonged plant growth and provided optimum conditions for selection in the breeding nurseries at all research stations across the country. Two distinct zones must be considered in developing wheat varieties across the northern cereal region of Algeria. The extreme northern coastal plain has a mild climate, no freezing temperatures and annual average rainfall varying from 400 to 800 millimeters. The second region is a high plateau lying inland 60 to 100 kilometers from the coast. This plateau extends over 1000 kilometers east to west across the country and ranges from 600 to 1200 meters in altitude. This large cereals region is subject to snow, late frost, early siroccos (hot dry dessert winds) and annual average rainfall varies from 250 to 650 millimeters.

BREAD WHEATS

Interestingly the long season with good moisture provided optimum conditions for development of the medium to late maturing varieties. The Mexican variety Siete Cerros, and Italian variety, Strampelli, were the top yielders, as seen in Table IV, for all the national micro-yield trials and large scale production. Siete Cerros has a very good general resistance to the 3 rusts and loose smut but is highly susceptible to Septoria. On the contrary, Strampelli, has good resistance to Septoria but is susceptible to both stem and leaf rust. Data from the two previous years which had much lower rainfall show these two varieties with the highest yields. Other varieties of interest from the 7th ISWYN are shown in Table V. The yields represent average from three experimental regions, Sidi-Bel-Abbès in the extreme west, Algiers in the center and El-Khroub near Constantine in the east. The Indian variety, Chhoti Lerma, always yields well in the absence of heavy stripe rust and Septoria attacks. The following three varieties, Toquifen, Victor I and Penjamo have resistance to Septoria tritici and good general adaptation to North African climate, however, the poor quality of Victor I prohibits its use in commercial production.

TABLE IV

TOP YIELDING BREAD VARIETIES FROM THE DIFFERENT NATIONAL YIELD TRIALS 1972-73

1971-1972

VARIETY OR CROSS	YIELD Q/H	LOCATION	HIGHEST % OF FLORENCE AURORE (all trials)
Strampelli	70.2	Guelma	166.8
Siete Cerros	65.2	Guelma	177.6
Un-SkxS.Past/Mara	60.8	Algiers	125.9
Chenab 70	59.8	Algiers	142.1
Un-SkxS.Past/Cno-Inia	59.6	Algiers	123.4
Mexipak 69	58.5	Guelma	184.8
CC-Inia "S" (143)	57.8	Algiers	136.1
Calidad "S" (Mex.1601)	55.4	Algiers	144.8
Wt_E^3-Nar59/Son64-TzppxY54	53.4	Algiers	150.9
Cno "S" - Inia "S"^{2}	53.1	Algiers	171.0
Inia "S" - Napo 63 (136)	52.7	Algiers	124.1
B21xKE 3.2 (French)	52.5	Algiers	130.6
Florence Aurore	52.5	Guelam	100.0
Inia 66	50.3	Algiers	133.2
Tobari 66	44.3	Algiers	142.6

Two locations, Algiers in the center and Annaba in the east gave good conditions for screening advenced lines and varieties against attack by Septoria tritici. Development of the Septoria occurred in mid-March, which is normally too late for much damage, however, cloudy wet weather with warmer temperatures allowed rapid increases in these two areas. Some of the best Septoria resistant lines and varieties are listed in Table VI. Total rainfall in these two regions was very high, as seen in the earlier precipitation chart, allowing good screening for Septoria. They are not, however, large wheat growing regions. The late development of Septoria rapidly killed all leaf tissue and heavily attacked the stem and leaf sheaths of the susceptible varieties as it moved up from the plant base. Selection was, therefore, based on degree of early (April 15) and late (June 10) attack as shown in the table, appearance of the grain and color of the straw. The Septoria resistant lines had beautiful bright golden straw in contrast to the dull gray colored straw of the susceptible varieties. The check variety, Super X, was dull gray and its grain was badly shriveled. Several lines, as indicated by stars in Table VI, although having small pustules on the upper leaves, maintained good leaf tissue with no further spreading of the Septoria.

DURUM WHEATS

Rapid improvement is needed in the durum wheat varieties specifically for Algeria, but generally for North Africa. The local varieties, although well adapted are very tall susceptible to the three rusts and lack yield potential with higher rates of fertilizer. The importance of durum wheat in Algeria can be seen by comparing the total area wuth that of bread wheat. Of the roughly 2,250,000 hectares of wheat, there are 1.5 million hectares of durum and 0.75 million hectares of bread wheat.

The major problem with durum wheat introductions is lack of disease resistance. The diseases in order of importance are : stem rust, Septoria tritici, leaf rust and stripe rust. The three rusts can develop in any of the cereal areas throughout the country, however, Septoria tritici is restricted to the coastal plain and to areas of higher total rainfall. Varietal recommendations are based on total annual rainfall.

The best yielding varieties and lines from the 3rd IDYN are given in Table VII. The average yield is based on three locations, Algiers in the center, Sétif on the eastern high plateau and Guelma in the eastern plain. The Crane sibs (both A and B) have good yielding ability but are susceptible to rusts and Septoria. The Argentina variety, Parana 66/270 shows good promise with high yield and general resistance for all of the diseases. It is a short-strawed variety with good tillering ability. Another promising line, T. dic. vernun x G 11 "S" gives high yield and good stem rust resistance. Its use commercially remains questionable due to susceptibility for leaf rust and Septoria tritici. The Mexican variety, Cocorit 71, yields well, has good adaptation and some tolerance to Septoria tritici. It has better stem rust resistance than Jori 69 and could be grown commercially for the present time. The Tunisian variety, Inrat 69, has good yielding ability and Septoria resistance. It is gradually losing its resistance to both stem and leaf rust. This variety, however, shows definite resistance to Fusarium culmorum. Jori 69 yields very well in the absence of heavy disease attacks. This variety is however, susceptible to the three rusts, Septoria tritici and Fusarium culmorum. The variety is being grown commercially this year, but will have to be replaced as soon as other varieties can be multiplied.

Promising selections and varieties from other yield trials are :

a) T. polonicum x Z-B dwarf, a local selection adapted to the Sétif high plateau region. Due to the wide cross, it has been impossible to fix this line.

b) Anhinga "S", selection from a previous IDYN which has no pedigree, and

c) Mandon, a French variety showing promise in the coastal plain.

The best leaf rust and Septoria resistant lines listed in Table VIII were selected from the 3rd IDSN at the central Algiers station. Heavy attacks of both diseases killed the susceptible varieties and caused extensive shriveling of the grain. There was not sufficient stem rust to screen these lines, but it is hoped that some will have enough resistance for replacing the present commercial varieties.

AVERAGES OF THE HIGHEST YIELDING LINES AND VARIETIES FROM THE 7TH INTERNATIONAL SPRING WHEAT YIELD NURSERY FOR ALGIERS, EL KHROUD AND SIDI DEL ABBES 1971-72, ALGERIA

		YIELD Q/H
1	Choti Lerma	50.4
2	Toquifen	49.5
3	Victor I	48.4
4	Penjamo 62	48.3
5	Chenab 70	48.2
6	UP 301	48.1
7	Tanori 71	48.1
8	Son 64-K1 Ren	47.9
9	Pitic 62	47.4
10	Calidad	46.7

TABLE VI

BEST SEPTORIA RESISTANT BREAD WHEAT LINES AND VARIETIES FRO SCREENING NURSERIES AND YIELD TRIALS

ALGIERS 1971-72

VARIETY OR CROSS	ORIGIN	SEPTORIA OBSERVATION EARLY	LATE
(My54-Nor10/Y50XKLine)x(T/Chin166xL-N/M^2-ME)Fr A-3538-12P-5P-5P-1D	PON 30	3	6
H480xAn64A II-MJ-191-1P-1P-1D	" 30	3-5	3-5
Ofn(Con-N/MtxMen)(Kt/Bg-Fn/G4)	" 44	4	8*
Pato (B) 21974-4R-4M-2R-OY	" 115	1	7
On-Bb/Cno-7CerrosxTob-BMan 34310-6M-1Y-OM	" 183	3	7
CC - Tob^2 24027-13t-1M-1Y-OM	" 192	3	7
Jar-Napo63/LR64xTzpp-AnE 21823-10Y-2M-4Y-1M	" 193	4	8
(BYE^2)-(TC)(TacB-TC^2)x(BYE^2-TC)(Z-BxW) D-31539-3L	" 207	6	7
Super X	" 175	8	9
TobxKlPet-Raf II-23438-5M-1Y-3M-1Y-OM-OMb	POT 7142	6	7*
Mex 1601 = Utique (IT 2349)	" 7191	6	6
Napo 63xTzpp-Son 64/8156 (R) 28071-7M-3Y-3M-OY-OMb	" 7310	4	5
Kt/Bg-Fn/UxB2a VI-1S-22t-1t-1b-1t-1b-OMb	" 7345	4	5
Fn-K58/Nx(Fr-KAD/Gb)^2 II-14259-5t-1b-1t-2b-OMb	" 7346	6	6
Mexicano 1481	" 7520	4	5
Inia-CnoxCal. 27220-44M-OY-48M-OY-(1-3Y)	IBWSN 28	3	7
Cno"S"-Gallo 27829-19Y-2M-1Y-OM	" 114	4	6
Tob 66 - CC x Pato 27369-1R-4M-OY	" 147	2	4
NO66-CNO"S"xJar 66 27343-2R-3M-3T	" 151	1	3
Era	" 211	4	5
Pj62-Cal 30405-19M-2Y-1M-OY	" 287	2	4*
(Tzpp-Wt_F^2xNapo 63)(Inia"S"/S64xTzpp-Y54) 29791-11R-4M-1Y-1M-OY	" 328	2	5*
(Nar59-10115/PJ62-GbxTzpp-Knott≠≠2)Cal30409-44R-1M-3Y-1M-OY	" 330	3	6

* Very small resistant type pustule not spreading on leaf - Tolerance.

TABLE VII

AVERAGES OF THE BEST YIELDING VARIETIES AND LINES FROM THE 3RD INTERNATIONAL DURUM YIELD NURSERIES FOR ALGIERS, SETIF AND GUELMA, ALGERIA 1971-72

	YIELD Q/H	SETIF P.GLUM	ALGIERS P.REC.	GUELMA P.GR.TR.	SEPT. 15 APR.	SEPT. 10 JU.	FUSARIUM CULMORUM
ane "S" B	49.3	80S	80S		7	9	S
dic.ver. x G LL "S"	48.1	R	100S		6	8	S
rana 66/ 270	47.6	R	R		4	4	MS
corit 71	47.4	20MR	80S	40S	7	7	S
sne "S"	45.2	60S	60MS-S	10MR	4	8	S
"S" - Cr "S"	44.2	40S	60MS		5	9	S
rane "S" A	43.7	80S	80S		8	9	S
peiti	43.6	80S	80S		3	8	R?
rat 69	43.1	20S	80MS		4	7	R
uilafen	41.8	80S	100S		5	7	R?
ori C 69 (check Durum)	35.9	60S	80S	Tr	6	9	S
ajonne 72 (check Bread)	50.3	R	R		4	8	-

TABLE VIII

BEST LEAF RUST AND SEPTORIA RESISTANT DURUM WHEAT LINES AND VARIETIES FROM 3RD IDSN

ALGIERS 1971-72

VARIETY OR CROSS		ORIGIN	P.RECONDITA LEAF RUST	SEPTORIA OBSERVATION EARLY	SEPTORIA OBSERVATION LATE
Flamingo "S"		IDSN 011	20MR-MS	4	8
Flamingo "S"		" 088	40MS 1/	5	7
Jo"S"(LD-357$_E$-Tc^2/G11"S")	D-27588-5M-3Y-1M-500Y	" 012	20MR	4-5?	8
D-21563-AA"S"	D-27625-5M-2Y-2M-1Y-0M	" 045	10MR	5	7
D-21563-JO"S"	D-31538-14M-3Y-0M	" 068	TrR 1/	4	7
D-21563-Jo"S"	D-31538-14M-6Y-0M	" 069	10MR 1/	5	7-8
(LD-357$_E$-Tc^2)Jo"S"	D-27534-3M-2Y-1M	" 0137	20MR 1/	5	9
Jo"S"(LD-357$_E$-Tc^2/G11"S")	D-27572-20M-3Y-1M	" 0141	10MR 1/	4	7-8
Jo"S"(LD-357$_E$-Tc^2/G11"S")	D-27572-20M-3Y-3M	"" 0142	20MR 1/	6	8
Jo"S"(LD-357$_E$-Tc^{2}xG11"S")	D-27588-5M-3Y-3M	" 0146	20MR	4	8
D-Duck(DyE^2-Tc)(LD-357$_E$-Tc^2/G11"S")	D-27649-0M-38Y-1M	" 0159	20R 1/	7	8
Flc"S"-Jo"S"	D-31679-4M-1Y-1M-0Y	" 0188	TrR 1/	4	6-7
Flc"S"-Jo"S"	D-31679-9M-1Y-2M-0Y	" 0189	TrR 1/	6	8
Stw63-G11"S"xRD-119-1M-2Y	D-31759-1M-2Y-1M-0Y	" 0219	20MR-MS 1/	4	7-8
Cr"S"-Gs"S"		" 0223	20MR	5	7-8
Masa-117Y-1M-0Y		" 0230	40MS	6	7-8
Jo"S"/LD-357$_E$-Tc^2-G11"S"	D-27588-5M-3Y-3M-1Y-1M-0Y	"0 0243	TrR	3	6-7
D-21563-AA"S"	D-27625-5M-2Y-2M-1Y-1M-0Y	" 0252	20R	5	6
Gs"S"-Cr"S"	D-27676-6M-1Y-1M-2Y-1M-0Y	" 0254	10R 1/	7	9

1/ Also reported resistant to all 3 rusts in Delhi, India.