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RESULTS OF THE THIRD INTERNATIONAL BREAD WHEAT SCREENING NURSERIES

(SERIES A and B) 1969-1970

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CONTENTS

THIRD INTERNATIONAL BREAD WHEAT SCREENING NURSERY, 1969-1970
SERIES A [1]

[1] This report was prepared by CIMMYT staff. CIMMYT accepts full responsibility for misinterpretation or misrepresentation of data supplied by the cooperators. Requests to re-present these results should be addressed to Dr. Keith W. Finlay, CIMMYT, Londres 40, Mexico 6, D. F., Mexico.

Results of the Third International

Bread Wheat Screening Nursery (IBWSN)

Series A 1969-1970

ABSTRACT

Many potentially useful advanced spring wheat lines were identified in the Third International Bread Wheat Screening Nurseries (Series A). One table is presented in summary of those entries which gave resistant type reactions at all 24 reporting locations. Several exhibited promise for several disease reactions. Additional notes on yield potential are presented for those entries selected for disease resistance.

INTRODUCTION

The International Screening Nursery, as it was previously known,[1] was initiated to complement the International Spring Wheat Yield Nursery (ISWYN). The primary purpose of the ISWYN is to evaluate in replicated experiments advanced lines and new varieties. Only secondary emphasis could be placed on the immediately available advanced lines and/or new sources of disease resistance since the numbers of entries must be limited.

The International Screening Nursery was instituted to supplement the ISWYN experiments and give cooperating scientists a broader look at recently selected advanced lines. This current series began the two nurseries a year effort to double the amount of material offered and better synchronize shipping dates to match regional planting dates. This section reports the results returned by cooperating scientists on the International Bread Wheat Screening Nursery (Series A).

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[1] As a historical note, the nursery's name had to be lengthened to distinguish it from two new nurseries initiated recently to get similar information for durum and triticale breeding projects around the world.

PROCEDURES

The Third IBWSN (Series A) consisted of 262 advanced generation (F_3-F_7) lines and check varieties of spring wheat submitted to 35 cooperators. An additional 5 "short sets" composed of the first 91 entries of the complete sets were also sent to cooperating scientists.

The distribution of the IBWSN are deliberately biased towards the major spring wheat regions of the world, and areas with a high expectation of disease incidence.

Some of the seed for the Third IBWSN (Series A) 1969-1970 was produced in increase plots at Centro de Investigaciones Agricolas del Noroeste (CIANO) at Ciudad Obregon, Sonora, Mexico during the 1968 growing season. Seed for the remaining sets was obtained from increase plots at Toluca, Mexico, during the summer of 1969. An additional 25 entries were added to these sets. Results from these additional entries are not included for reasons of consistency.

Cooperators were urged to use professional judgment in planting, care and types of data collected. Data were requested on differential disease reactions (e. g. stem, leaf and stripe rusts, Septoria etc.) agronomic characters and yield.

Statistical treatment of the data was not considered due to the nature and design of the experiment and the types of results returned. Data summary was made by reviewing each return for differential reactions. Entries showing acceptable reactions for disease at all locations giving differential reactions were tabulated, each disease being handled individually. This information was then combined into one summary table. Finally, the top 10% yielding varieties were selected from those locations reporting yield and entered, by location, into the summary table. This format, one of several previously considered, represents the least complex method of presenting those entries which may possess broad disease resistance to one or more diseases with some information on yield performance at several locations.

RESULTS and DISCUSSION

Table 1 presents the cooperating scientists, locations of trials and the types of differential data reported. The results presented in this report are based on the effort and information obtained from these cooperators. Table 2 summarizes these data.

Summarization of the reported rust reactions was made by noting only those IBWSN entries which had readings of less than 10S at all locations reporting good differential reactions. The "less than 10S" threshold was

selected as a compromise between different forms of resistance to the three rusts. Selection implies neither hypersensitive nor general types of resistance, but does suggest that further testing of these lines may prove worthwhile.

Only three entries proved resistant (i.e. 10% or less) to Septoria at all reporting locations. This is likely due to our inability to distinguish between species of Septoria as well as the possibility of races within a species.

Yield data were provided by many cooperators and, although unreplicated, suggest broad adaptability and high yield potential might be found within this set of entries selected for disease reactions.

The mention of any IBWSN entry in this report should not in any way be construed as an endorsement by CIMMYT. Rather, this report is intended to serve as a source of information for continued study.

TABLES

TABLE 1. Cooperating stations, planting dates and types of differential data supplied by cooperating scientists for the Third International Bread Wheat Screening Nursery (Series A) 1969-1970. The table is sectioned into those cooperators receiving the full nursery (262 entries) and those cooperators receiving a short set of the first 91 entries.

	Country	Location	Cooperators	Date Planted	Differential Data Reported On:				
					Yield	Stem Rust	Leaf Rust	Stripe Rust	Septoria
1	Afghanistan	Kabul	Mr. Ahad & E. V. Staker	--	X			X	
2	Afghanistan	Mazar-i-Sharif	Mr. Atiq Ullah & K. Magee	--	X				
3	Argentina	Maria Laura	DeKalb, Argentina	July 25, 1970	X		X		
4	Canada	Winnipeg, Manitoba	L. E. Evans	May, 1970	X		X		
5	Ecuador	Santa Catalina	Dept. of Cereals, Wheat Section	Feb. 23, 1970	X	X	X	X	X
6	Ethiopia	Dire Dawa	B. Gebrekidan		X	X	X		
7	Ethiopia	Holetta	F. F. Pinto	July 7, 1969				X	X
8	Guatemala	Quezaltenango		--			X	X	X
9	India	Pantnagar	J. P. Srivastava	--		X	X		
10	Iran	Karaj		Nov. 11, 1969	X			X	
11	Mexico	Toluca	CIMMYT	May, 1970		X	X	X	
12	Morocco	Merchouch	A. Acosta C.	Dec. 26, 1969	X				
13	New Zealand	Palmerston North	J. M. McEwan	--	X				
14	Pakistan	Lyallpur		--			X	X	
15	Poland	Radzikow	S. Starzycki	--	X	X	X		X
16	Republic of South Africa	Lynn East, Pretoria	D. Rossouw	April 20, 1970	X	X	X		
17	United States of America	Casselton, North Dakota	Agronomy Seed Farm	--	X		X		
18	United States of America	Ft. Collins, Colorado	Cargill Research Staff	April 11, 1970	X	X			
19	United States of America	Glyndon, Minn.	Cargill Research Staff	May 22,.1970	X	X			

Short Set Recipients

20	Algeria	El-Harrach	Director, National Agr. Research Center	Jan. 26, 1970	X	X	X	X	
21	Israel	Hazera	S. Y. Atsmon	--	X				X
22	Israel	Tel-Aviv University	I. Wahl	--					X
23	Kenya	Molo	A. M. Patel, P. Kirika & J. Nyagol	July 1, 1970	X	X	X	X	X
24	Kenya	Njoro	R. Little & A. M. Patel	April 27, 1970	X	X	X	X	X

TABLE 2. Third International Bread Wheat Screening Nursery (Series A) entries of potential interest to cooperators. Listed entries were less than 10S at all locations for one or more disease reactions when differential reactions were recorded by cooperators. In addition, notes on the frequency of an entry's yielding in the top 10% at locations reporting yield values are given. Location numbers correspond to Table 1.

Entry No.	Variety or Cross	Pedigree	Yield (by location numbers)		DISEASE			
			Complete Sets	Short Sets	Rust Stem	Rust Leaf	Rust Stripe	Septoria
1	Inia 67			20	X			
3	Tobari 66		4,19		X	X		
10	Son 64-K1 Rend	19975-68Y-1J-6Y-2J-1Y-0J				X		
11	Son 64-K1 Rend	19975-68Y-1J-6Y-3J-109C	16			X		
12	El Gau-Pi 62/Son 64xSK$_E$-An$_E$"S"	21171-1C-3Y-2M-1Y	4,6,10			X		
13	12300-Mas #5xGto/Son 64xTzpp-Nai 60	21742-3T-4M-1T-3M	6,10,16,17			X		
21	Tob 66xK1 Pet-Raf	22438-5M-1Y-3M-1Y-0M			X	X		
23	Son 64-Y50$_E$xGto/Inia "S"	23528-7M-1T-1M-1Y-0M				X		
24	Son 64-Y50$_E$xGto/Inia "S"	23528-7M-1T-1M-7Y-0M	3,16	20		X		
25	Son 64-Y50$_E$xGto/Inia "S"	23528-7M-1T-1M-8Y-0M	12,16	20	X			
26	Son 64-Y50$_E$xGto/Inia "S"	23528-39M-3T-1M-4Y-0M	4,13,19	20,23		X		
27	Son 64-Y50$_E$xGto/Inia "S"	23528-102M-0Y-3M-2Y-0M	5			X		
28	Son 64-Y50$_E$xGto/Inia "S"	23528-102M-0Y-31M-1Y-0M	5,10	20,23	X			
29	Son 64-Y50$_E$xGto/Inia "S"	23528-7M-1T-1M-6Y-0M	2,16	20,21	X	X		
31	Ciano "S"-Son 64	23582-12M-2Y-2M-0Y	10,19		X	X		
33	Ciano "S"-Son 64	23582-12M-2T-1M-1Y-0M	12		X	X		
37	Ciano "S"xSon 64-K1 Rend/8156	23584-18M-3Y-3M-0Y	3,16			X		
43	Ciano "S"xSon 64-K1 Rend/8156	23584-100M-1Y-4M-3Y-0M	12		X			
45	Ciano "S"xSon 64-K1 Rend/8156	23584-18M-10Y-3M-3Y-0M	3,10	24	X			
47	Ciano "S"xSon 64-K1 Rend/8156	23584-6M-2Y-1M-1Y-0M				X		
48	Ciano "S"xSon 64-K1 Rend/8156	23584-5M-10Y-3M-7Y-0M				X		
51	Ciano "S"xSon 64-K1 Rend/8156	23584-100M-0Y-30M-1Y-0M	3	24	X			
52	Ciano "S"xSon 64-K1 Rend/8156	23584-100M-37Y-2M-6Y-0M		24	X			
53	Ciano "S"xSon 64-K1 Rend/8156	23584-100M-37Y-2M-8Y-0M	1	24	X			
55	Ciano "S"xSon 64-K1 Rend/8156	23584-100M-37Y-2M-9Y-0M	3		X			
59	Ciano x Nad 63-Chris "S"	23586-21M-1T-3M-1R	1,2			X		
60	Tobari 66		1,2,4,10	21,23,24		X		
63	Ciano "S"-Inia "S"	23597-2M-1Y-0M	4			X		
79	Son 64-Y50$_E$xGto/Tob "S"(2)	24027-13T-1M-8Y-0M	10,13,15	19		X		
82	Ciano "S"-Crespo	24998-27M-0Y	5,19			X		
83	Tob 66-Ciano "S"	25000-6M-2Y-0M	5,19			X		
84	Tob 66-K1 Pet-Raf/H 524-2221	25039-6M-2Y-0M				X	X	
86	Ciano "S"-Tob "S"	25079-20M-1R-0M-0Y	2,3			X		
91	Tobari 66		4,6,13,19					
92	Inia 66-Bb	26478-16M-0Y			X			
94	Note-Bb	28480-1M-0Y			X			
95	Bb-Calidad	27104-49M-0Y	2,4		X			
96	Ciano "S"^{2} x LR 64^2-Son 64	27127-80M-0Y	10		X			

98	Son 64-K1 Rend/Ciano "S"xLR 64 (2)-Son 64	27139-29M-0Y			X	
99	Son 64-K1 Rend/Ciano "S"xLR 64 (2)-Son 64	27139-30M-0Y		X	X	
100	Son 64-K1 Rend/Ciano "S"xLR 64 (2)-Son 64	27139-37M-0Y			X	
101	Inia 67		6,17	X		
103	Tobari 66		4,5,10,13,15		X	
104	Son 64-K1 Rend/Ciano "S"xLR 64 (2)-Son 64	27139-57M-0Y	17		X	
105	Son 64-K1 Rend/Ciano "S"xLR 64 (2)-Son 64	27139-64M-0Y	10		X	
111	Ciano-Inia x Calidad	27224-64M-0Y	2,4	X		
114	Lib-64-8-15 x Inia/Inia-Ciano x Son 64-K1 Rend	27298-6M-0Y	4	X		
116	Ciano(2)-Chris	27341-15M-0Y	1,4	X		
122	Ciano "S"(LR 64-Son 64/Son 64xTzpp-Y54)	27936-25M-0Y		X		
123	Ciano "S"-Bajio 67	27939-8M-0Y	3,18	X	X	
124	Ciano "S"-Bajio 67	27939-48M-0Y		X		
127	Ciano-Inia	25329-1T-7M-0Y	16		X	
131	Son 64-Y50$_E$xGto/Ciano (2)	25952-3R-1M-0Y			X	
132	Son 64-Y50$_E$xGto/Ciano (2)	25952-3R-3M-0Y	17		X	
133	Tob 66-Centfn x Bb	25973-13Y-1M-0Y	16	X	X	
135	Inia x Bb	26478-7Y-8M-0Y	2,12		X	
137	Inia x Bb	26478-7Y-10M-0Y	2,16	X		
141	Inia x Bb	26478-43Y-2M-0Y	5,15,17,18	X		
142	Inia x Bb	26478-87Y-5M-0Y			X	
143	Son 64-K1 Rend x Bb	26502-8Y-5M-0Y			X	
145	Ciano (2)-Chris	26520-21Y-5M-0Y			X	
149	Ciano (2)-Chris	26520-35Y-1M-0Y	3,18	X		
150	Ciano (2)-Chris	26520-28Y-2M-0Y	15	X	X	
151	Ciano (2)-Chris	26520-38Y-1M-0Y	6	X		
155	Ciano (2)-Chris	26520-53Y-1M-0Y			X	
156	Ciano (?)-Chris	26520-15Y-5M-0Y	15,18		X	
157	Ciano (2)-Chris	26527-1T-1M-0Y			X	
158	Ciano (2)-Chris	26527-1T-2M-0Y	15		X	
161	Ciano-Bb	26528-1Y-2M-0Y	5		X	
162	Ciano-Bb	26529-2Y-1M-0Y	15	X		
163	Ciano-Chris x Inia	26556-2Y-1M-0Y			X	
164	Ciano-Chris x Bb	26558-69Y-6M-0Y	15		X	
165	Ciano (2)-Chris	26560-7Y-1M-0Y	15,18		X	
167	Bb-Ciano	26572-42Y-1M-0Y	12,15	X		
170	Bb-Ciano	26572-61Y-1M-0Y	15		X	
171	Bb-Ciano	26572-61Y-3M-0Y	1,3,18	X	X	
172	Bb-Ciano	26573-17Y-2M-0Y	12,15	X	X	
173	Bb-Ciano	26573-33Y-5M-0Y	1,12	X	X	X
174	Bb-Ciano	26573-33Y-3M-0Y	12,15		X	X
175	Bb-Ciano	26573-50Y-1M-0Y	19		X	X
176	Bb-Ciano	26573-33Y-7M-0Y	18		X	
177	Bb-Ciano	26573-50Y-2M-0Y	1,5		X	
181	Bb Ciano	26592-1T-4M-0Y		X		
182	Bb-Ciano	26592-1T-17M-0Y		X		
185	Bb-Tob 66	26595-8Y-1M-0Y	3		X	
191	Tob 66-NP 832	26896-5Y-1M-0Y	12		X	

TABLE 2 (Cont.)

Entry No.	Variety or Cross	Pedigree	Yield (by location numbers) Complete Sets	Yield (by location numbers) Short Sets	DISEASE Rust Stem	DISEASE Rust Leaf	DISEASE Rust Stripe	DISEASE Septoria
192	Tob 66-NP 832	26896-12Y-2M-0Y	12,13,15,18			X		
193	(Tob 66/Son 64-Y50$_E$ x Gto)Pato	27369-1R-4M-0Y	1,12			X		
194	Bj-Calidad	27455-3R-7M-0Y				X		
195	Bj-Calidad	27455-3R-9M-0Y				X		
196	Tzpp-Son 64/LR 64 x Tzpp-An$_E$	27456-5R-3M-0Y				X		
197	Ciano-Jar 66	27569-6R-1M-0Y	17,18			X		
200	Tob 66-Ciano "S"	24908-34M-4Y-2M-0Y	18			X		
201	Inia 67				X			
203	Tobari 66		13		X			
204	Tob 66-Ciano "S"	24908-53M-1Y-2M-0Y	19			X		
205	Tob 66-Ciano "S"	24908-53M-1Y-4M-0Y	19			X		
206	Tob 66-Ciano "S"	24908-53M-2Y-1M-0Y				X		
207	Note 66-Ciano "S"	24940-37M-5Y-1M-0Y	12			X		
208	Note 66-Ciano "S"	24941-13M-3Y-1M-0Y	5			X		
209	Note 66-Ciano "S"	24941-23M-5Y-2M-0Y	19		X			
213	Kl Rend-Son 64 (2) x Inia/Ciano "S"	24970-12M-2T-17M-0Y			X			
214	(Son 64 x Tzpp-Y54/Son 64-Y50$_E$ x Gto)Ciano "S"	24975-8M-3Y-1M-0Y	1,5		X	X		
215	Ciano "S"-Tob 66	24989-7M-1Y-1M-0Y	1,5,19			X		
217	Ciano "S" x Crim-Chris	24997-23M-1Y-1M-0Y	17,19			X		
218	Tob 66-Ciano "S"	25000-13M-2Y-1M-0Y	6		X	X		
219	Tob 66-Ciano "S"	25000-13M-3Y-2M-0Y			X			
220	Inia 67		10,17,19		X			
221	Tob 66-Ciano "S"	25000-26M-1Y-1M-0Y	13		X			
222	Tob 66-Ciano "S"	25000-26M-3Y-1M-0Y			X	X		
223	Tob 66-Ciano "S"	25000-38M-2Y-1M-0Y	13		X			
224	Tob 66-Ciano "S"	25000-38M-2Y-2M-0Y	19		X	X		
225	Tob 66-Ciano "S"	25000-45M-2Y-3M-0Y			X	X		
226	Calidad-Jar	25009-20M-1R-1M-0Y	17		X	X		
229	Ciano-Pj 62	25092-30M-2T-7M-0Y				X		
230	Ciano "S"-Pj 62	25093-19M-2Y-2M-0Y	3		X	X		
231	Ciano-Pj 62	25093-30M-1T-2M-0Y				X		
232	Ciano-Pj 62	25093-30M-2T-1M-0Y	19			X		
233	Ciano-Pj 62	25093-30M-2T-8M-0Y			X	X		
234	Ciano-Pj 62	25093-30M-2T-11M-0Y	5			X		
236	Ciano "S"-Note 66	25111-15M-12Y-4M-0Y	19		X	X		
237	Ciano "S"/Son 64-Y50$_E$ x Gto	25342-7M-1R-3M-0Y			X			
241	Ciano "S" x Son 64-Kl Rend/8156	23584-26Y-2M-4Y-2M-0Y			X	X		
242	Ciano "S" x Son 64-Kl Rend/8156	23584-15Y-10M-1Y-2M-0Y	12,19		X			
243	Ciano "S" x Son 64-Kl Rend/8156	23584-98Y-5M-1Y-1M-0Y	12			X		
244	Ciano "S" x Son 64-Kl Rend/8156	23584-102Y-4M-1T-4M-0Y	5,17		X	X		
245	Tob "S"-8156 x Ciano "S"	23802-16Y-2M-1Y-1M-0Y	1		X			
246	Inia"S"(Son64A x Tzpp-Y54/LR64(2)Son64 x Jus)	23817-4T-1M-1Y-1M-0Y	1,5,12		X			
247	Inia"S"(Son64A x Tzpp-Y54/LR64(2)Son64x Jus)	23817-4T-1M-7Y-4M-0Y	1,2,3,12,16,17		X			

248	(Son 64-Y50$_E$ x Gto/8156)Ciano "S"	23885-11T-2M-6Y-1M-0Y		X	
250	Ciano "S"-Jar "S"	23949-3T-3M-2R-1M-0Y			X
252	Ciano "S" x El Gau-Son 64/Tzpp-An 64	23973-3T-1M-2R-2M-0Y	5		X
253	B. Bol.-Pi 62 x Inia 66	24066-1Y-3M-2T-3M-0Y			X
255	Tob 66-Purdue x Ciano	24277-20Y-1M-1T-2M-0Y	2, 5, 19		X
256	Tob 66-Ciano	24321-7Y-1M-2T-3M-0Y	13	X	X
257	Ciano "S" x Son 64-Kl Rend/8156	23584-18M-10Y-1M-1Y-1M-0Y		X	
258	Ciano "S" x Son 64-Kl Rend/8156	23584-18M-10Y-2M-1Y-1M-0Y	13	X	
260	Tobari 66		13		X

THIRD INTERNATIONAL BREAD WHEAT SCREENING NURSERY, 1969-1970
SERIES B

Results of the Third International

Bread Wheat Screening Nursery (IBWSN)

Series B 1969-1970

ABSTRACT

A summary of the results of the Third International Bread Wheat Screening Nursery (Series B) is presented in one table. Several potentially valuable spring wheat advanced lines were identified for disease reactions at 19 reporting locations. Additional notes are given on yield potential and reactions to specific races of stem and leaf rusts.

INTRODUCTION

As part of a continuing project of testing late generation materials CIMMYT offered the Third International Bread Wheat Screening Nursery (Series B). Cooperating scientists were urged to select the best material for use as either parents in their breeding programs or for new varieties and return reports on each entry's performance. CIMMYT then summarizes this information into one report in an attempt to identify the better entries over all locations. The intent of the report is to return to cooperators a complete yet simple, summary to complement the information of one location. It is felt that data from several locations around the world can substitute for several years testing at one location without a direct loss of valuable time and effort.

We at CIMMYT are now concentrating on new formats aimed at specifically reducing the cooperators' work-load further and shortening the time necessary to return summaries. We hope that shortly these changes will be formalized and instituted.

PROCEDURES

The Third IBWSN (Series B) consisted of 550 advanced generation (F_3-F_7) lines and check varieties of spring wheat submitted to 25 cooperators around the world.

The distribution of the IBWSN are deliberately biased towards the major spring wheat regions and areas with a high expectation of disease incidence.

All of the seed for IBWSN (Series B) 1969-1970 was produced in increase plots in Toluca, State of Mexico, during the summer of 1969.

Instructions for the management of the nursery and types of information to be recorded were the same as previous IBWSN's. Data summary and general report formats followed those of other screening nursery reports with the exception that only the top 25 yielding varieties at each location were selected in an effort to simplify the report.

RESULTS and DISCUSSION

Table 1 presents the cooperating scientists, location of trials and the types of differential data reported from the 19 stations. The results presented in this report are based on the efforts and information obtained from these cooperators. Table 2 summarizes these data.

The acceptable level of rust reaction was again set at "less than 10S" since this level should allow both hypersensitive and general resistance to be selected. This threshold also tends to have the desirable effect of reducing the number of entries to a workable level of (hopefully) only the best. We emphasize, however, that selection implies neither hypersensitive nor general types of resistance, but rather lines worthy of further testing.

Lines with desirable reactions to Septoria were again few in number, which, again, may reflect our inability to distinguish between species of Septoria or races within a species.

Many cooperators supplied yield data. Although these were unreplicated, they are considered valuable indications of high yield potential and broad adaptability which might be identified within this set of entries selected for disease reactions.

Greenhouse seedling reaction to known races of Puccinia graminis tritici and P. recondita were submitted by I. A. Watson of the University of Sydney, Australia. The stem rust races used were identified as 21-1, 2, 5; 34-2, 4, 5; 34-1, 2, 3, 4, 5, 6, 7 and 222-1, 2, 3, 5, 6, where 21, 34 and 222 correspond to the international system of race identification and numbers 1 = Sr 6, 2 = Sr 11, 3 = Sr 9b, 4 = Sr Tt, 5 = Sr 17, 6 = Sr 8 and 7 = Sr 15. Information from this report is offered in Table 2 for selected entries with the table heading race identifications of 1, 2, 3 and 4 for the above races, respectively.

Information on seedling reaction to one race of leaf rust is also presented in Table 2. The race used was 122-1, 2, 3, and carried at least three genes for pathogenicity against hypersensitive genes for resistance to P. recondita.

The mention of any IBWSN entry in this report should not in any way be construed as an endorsement by CIMMYT. Rather, this report is intended to serve as a source of information for continued study.

LITERATURE CITED

1. MacKenzie, D. F., S. Rajaram and K. W. Finlay. 1970. Results of the First and Second International Screening Nurseries (1967-1969). International Maize and Wheat Improvement Center Research Bulletin No. 16. Mexico, D.F.

TABLES

TABLE 3. Cooperating stations, planting dates and types of differential data supplied by cooperating scientists for the Third International Bread Wheat Screening Nursery (Series B) 1969-1970.

	Country	Location	Cooperators	Date Planted	Differential Data Reported On:				
					Yield	Stem Rust	Leaf Rust	Stripe Rust	Septoria spp.
1	Argentina	Balcarce	DeKalb, Argentina	--	X	X	X		
2	Australia	University of Sydney	I. A. Watson	Greenhouse		X	X		
3	Brazil	Julio de Castilhos	J.W. Gibler & Staff	June 27, 1970			X		
4	Ecuador	Santa Catalina	Dept. of Cereals, Wheat Section	--	X			X	X
5	Lebanon		N. Narvaiz & Staff	--	X			X	
6	Mexico	Obregon, Sonora	CIMMYT	Nov. 1969	X	X	X		
7	Morocco	Merchouch	A. Acosta C.	Dec. 26, 1969	X				
8	Pakistan	Ishurdi	J. L. Sin	--	X		X		
9	Pakistan	Lyallpur		--			X	X	
10	Republic of South Africa	Langgewens	D. Rossouw	May 13, 1970	X				X
11	Republic of South Africa	Makatini	D. Rossouw	April 20, 1970	X	X	X		
12	Tunisia	Tunis	W. McCuistion & Staff	--		X	X	X	
13	United States of America	Davis, Calif.	J.A. Rupert & Staff	--	X				
14	United States of America	Ft. Collins, Colorado	Cargill Research Staff	--	X	X	X		
15	United States of America	Glyndon, Minn.	Cargill Research Staff	May 22, 1970	X				
16	United States of America	Minnesota	Funk Bros. Wheat Research Staff	--	X	X	X		X
17	United States of America	Paul's Valley, Oklahoma	DeKalb Agr. Research Staff	--			X		
18	United States of America	Stanton, Minn.	Northrup King Research Staff	--	X	X	X		
19	United States of America	Yuma, Arizona	Northrup King Research Staff	Dec. 18, 1969	X				

TABLE 4. Third International Bread Wheat Screening Nursery (Series B) entries of potential interest to cooperators. Listed entries were less than 10S at all locations for one or more disease reactions when differential reactions were recorded by cooperators. Notes are given on the frequency of an entry's yielding in the 25 best yielding entries at all locations reporting yield values. Location numbers correspond to Table 3. In addition, seedling reactions to known races of stem and leaf rust are given for all entries listed in the table. These values are those of I. A. Watson (see text for explanation of Races.)

Entry No.	Variety or Cross	Pedigree	Yield 1/	Stem Rust					Leaf Rust		Stripe Rust	Septoria spp.
				Field Data	Race 1	Race 2	Race 3	Race 4	Field Data	Race 1		
628	Son 64-Kl. Rend/Ciano "S"x LR 64^2-Son 64	27139-81M-1Y-0M		X	0;	;	;	;		;	X	
629	Olsen x Tob 66	27158-7M-3Y-0M		X	0	;2=	s x, 3	s ;, 3		;		
631	LR 64-Son 64 x Tob 66	27174-8M-1Y-0M		X	0;	;2=	;12-	22$^+$		;2		
633	Inia-Ciano x Calidad	27220-31M-1Y-0M		X	2=	;1	;2=	;1		;		
635	Tobari 66		5	X	0	;	2	;2=2		;2=		
636	Ciano "S" x Calidad	27449-4M-1Y-0M	15	X	0;	;	s ;, x	s ;,;2=	X	;		
638	Ciano "S" x Tob 66	27934-10M-1Y-0M	1, 4, 15, 16		0;	;	3	s x, 3-c	X	;1		
641	12300 x LR 64-8156/Ciano "S"	27965-5M-1Y-0M		X	0	0;	;	;2=		s ;, 3		
642	LR 64-Son 64 x Napo 63/Az 67	26018-19M-1Y-0M	1	X	s 2, 23	;2=2-	s ;2=, ;	;1		;		
644	LR 64-Son 64 x Napo 63/Tob	26078-11M-1Y-0M		X	0	;1	;1‡	;2=	X	;		
646	Cfn x Ciano "S"	25776-3Y-4M-1Y-0M	4	X	0;	0;	s ;,;1‡	;	X	s , ;2		
647	Ciano-7 Cerros x Tob-Ciano	25863-39Y-7M-1Y-0M			0;	s 2-, 2‡	;2=2-	;2=	X	;2=		
651	LR 64-Son 64 x Napo/Az 67	28018-50M-1Y-0M	1, 16		2	s ;2=, 2	;2=2	;		x=		X
656	(Son 64 x Y50$_E$-Gto/Crespo)(Cfn-Pj 62)	25949-9Y-1M-1Y-0M	4		;1-	0;	;1‡	;1‡		;	X	
664	Son 64-Kl. Rend x 23584	26502-8Y-2M-1Y-0M		X	0;	;2=	s;, 2=, 2$^-$	;2=		;2		
667	Son 64-Kl. Rend x 23584	26502-8Y-6M-5Y-0M	1	X	0;	;2=	;1	;		;2=		
670	Ciano "S"-Chris	26527-15Y-3M-1Y-0M	10	X	0;	0;	s ;1;1‡	0;		;	X	
671	Ciano-Chris x 23584	26558-32Y-1M-1Y-0M	6	X	;	;1=	;1‡	;1		;		
675	Pi 62 x T. Thumb-Son 64/Ciano^2	26745-86Y-1M-1Y-0M		X	0;	;	3	x$^-$		;		
681	Tob 66-NP 832	26898-12Y-2M-1Y-0M	4, 15	X	0	;	3=c	;2=2		;2=		X
684	Tob 66-NP 832	26896-12Y-2M-2Y-0M	10	X	0	;	3-c	3=c		;2=		X
685	Ciano^2 x Son 64-Kl. Rend	26529-3T-3M-5Y-0M	13		0;	0;	;1	2=		;2=		X
688	Bb #2	26592-1T-17M-4Y-0M		X	0;	;	;1	;		s ;, 0c=, 3		X
689	Ciano-Inia "S"	25329-1T-18M-1Y-0M	13	X	0;	;12=	1‡3=c	;2=2-		;2=		
690	23584/Son 64 x Y50$_E$-Gto	26575-11R-1M-1Y-0M	4, 13	X	2=	;2=	x-	;2=		;		
691	23584/Son 64 x Y50$_E$-Gto	26575-11R-1M-5Y-0M	4, 16	X	;2=	;12=	x-	s3;,2=, ;2=		;		
692	Ciano-Tob x Jar 66	27319-2R-5M-1Y-0M			0	;1=	3	x-	X	x		
695	Bj 67 x Calidad	27455-13R-5M-1Y-0M		X	0	;	;1, 3=	s2-;1‡, 3=c		;1		

696	Ciano 67		13	X	0;	;2‡	s;1.x.3	s;,x,3		;		
697	Ciano-Jar	27643-1R-2M-1Y-0M	4	X	0	0;	;1,2-	;		3		
702	23584- Ciano 67	26592-1T-15M-4Y-0M		X	0;	;12=	s;1,3-	;2=		;2=		
703	23584 - Ciano 67	26592-1T-17-M-5Y-0M		X	0;	;12=	s;1,2=	;	X	;2=		
704	Tob66 x Ciano "S"	24908-17M-2Y-1M-1Y	7,8		0	;	s;1,1‡	;	X	s;2=,x		
705	Bj67 - Calidad	27455-13R-5M-4Y-0M		X	0	;1=	s;1,3=	2=2		;	X	
706	Tob 66 y Ciano "S"	24908-26M-2Y-3M-1Y-0M	7,8	X	0;	0;	s;1,x,3	sx;2=2‡		s;,x=		
712	Ciano "S" x Tob 66	24995-1M-1Y-1M-3Y-0M		X	0;	0;	x=	;2=		;		
713	Ciano "S"2 x Crespo	24998-66M-1Y-1M-1Y-0M		X	0;	0;	x=	;		s;,x=		
717	Tob 66 x Ciano "S"	25000-6M-4Y-1M-1Y-0M		X	0;	;	3	2-		x		
719	Ciano2-Chris	25101-6M-2Y-1Y-0M		X	0;	2‡	;1	;		;2=		
727	23584 x Ciano 67	26592-1T-18M-1Y-0M			0;	;2=	;1	;		;2		X
735	Ciano "S"2 x PJ 62	25093-30M-1T-3M-3Y-0M			0;	;	3	3-c	X	;		
736	Azteca 67				0;	;2=	;1	;		;	X	
737	Azteca 67	25093-30M-1T-2M-1Y-0M	16		0;	x-	sx,3c	s2,3-		;		X
739	Ciano "S"- Crespo	25341-4M-1T-10M-1Y-0M			0	;	;1	0	X	s;,x=		
741	Ciano "S"2 x Crespo	24998-62M-2R-3M-1Y-0M	1	X	0;	;	x=	;		;		
746	Ciano "S" x Jar-Pi62	25128-4M-1R-1M-3Y-0M		X	0	0	;1	0;		;2		
750	Tob 66 x Ciano "S"	25000-4M-1T-23M-1Y-0M		X	0;	;2=	sx,3c	sx,3		;2=		
754	Tob 66 x Ciano "S"	24908-53M-1Y-4M-1Y-0M		X	0	;	0	;2=		;2		
757	Tob 66 x Ciano "S"	25000-13M-2Y-2M-2Y-0M		X	0;	;	;1	0;	X	;		
762	Ciano "S"2 x Chris	25101-6M-2Y-2M-2Y-0M		X	0	3-	;12=	;2=		;	X	
763	Tob x Ciano "S"	24908-11M-2T-1M-4Y-0M		X	s0,3=c	s;,;2=	;13=	s;1‡2,x		;2		
764	Tob x Ciano "S"	25000-4M-1T-21M-1Y-0M		X	0	;2=	x	2=2		;		
766	Tob 66 x Ciano "S"	25000-4M-1T-21M-3Y-0M		X	0	;	sx,3	;2=2‡		;2=		
767	Ciano "S"2 x PJ62	25093-30M-2T-2M-1Y-0M	4,15	X	0	;1	sx,3	sx,3		;		
768	Ciano "S"2 x PJ62	25093-30M-2T-7M-1Y-0M		X	0	;1	s0,3	s;,x		;		
769	Ciano "S"2 x PJ62	25093-30M-2T-8M-1Y-0M	4,15,16	X	0	;	x	x‡3		;		
776	Tob 66 x Ciano "S"	25000-6M-4Y-2M-1Y-0M		X	;	;	x=3-	;1‡3=c		x		
780	Tobari 66			X	0	;	3	x=		x=		
782	Son84K1.rend/Ciano"S"xLR642-Son 64	27139-68M-1Y-0M		X	0	;	s;1,x	s;2=2‡,x		;		
810	Ciano x K58-N/Tob-Cno	26132-2Y-3M-1Y-0M		X	0;	;	;2 3=	2=2=		-		
811	Inia x 23584	26478-7Y-5M-3Y-0M			;2=2-	;	;2 3=	2=2=	X	;		
815	Ciano "S" x Tob	27934-10M-2Y-0M	18		0	;1	sx,3	s;2,2+	X	;2=		
819	Son64-K1.rend x 23584	26502-6Y-5M-2Y-0M		X	;2=	;2=	3=	;22+		;2=		

TABLE 4.
(CONT')

No.	Variety or Cross	Pedigree	Yield 1/	Stem Rust					Leaf Rust		Stripe Rust	Septoria spp.
				Field Data	Race 1	Race 2	Race 3	Race 4	Field Data	Race 1		
839	Cno^2 x Son64-Kl.Rend	26529-3T-10M-1Y-0M	4		0	;2-	;1	;2=		;	X	
845	23584 x Cno67	26592-1Y-8M-3Y-0M		X	0	;	;1	;		;		
846	23584 x Cno67	26592-1T-16M-1Y-0M		X	;	2	s;1,3	;2=		;		
849	Cno^2-PJ 62	25093-30M-1T-1M-2Y-0M			0	;1	3	x	X	;2=		
852	23584 x Cno67	26592-1T-17-M-2Y-0M			;	;	;12=	;	X	s;,x		
861	Tob x Cno "s"	24908-11M-2T-8M-3T-0M	7,18	X	0	;	2 +	2 2+		s;,;2=		
867	Cno^2 x Chris	26527-1T-1M-1Y-0M			0	;	;2-	;	X	;		
869	Cno "s" x Jar-Pi62	25128-4M-1R-1M-2Y-0M		X	0	0	;1	;		;		
870	Cno "s" x Crespo	25341-4M-1T-10M-2Y-0M	14		0	0	x	;1‡	X	s;,;2		
872	Tabari 66				0	;	x	;1‡		;2=		
875	Tob x Cno "s"	24908-9M-4R-4M-1Y-0M		X	0	0;	;13=	;1		;		
878	Olsen x Tob 66	27158-7M-1Y-0M		X	0	;2=	3+	s2‡,3		;		
885	Cno^2 x Chris	27341-15-M-3Y-0M			0;	;	x	s;1,x=	X	;		
887	Bb#3	23584-26Y-2M-2Y-0M	14,16		;2-	s;,3	s;,;12	s;,;2=2	X	;2=		
889	Cno "s" x Crespo	25341-4M-1T-11M-1Y-0M			0	s;,2	;1	;12=	X	;		
894	Jar-Cno x Jar-NP876	25923-3Y-3M-1Y-0M	18	X	0	0;	;2	;	X	x		
900	Inia x 23584	26477-35Y-1M-1Y-0M	18	X	;2-	2-	x	;2=2-		;		
901	Inia 66 x 23584	26478-7Y-9M-2Y-0M	6,14,18		;2=	;2=	s;2,x	;12	X	;		
902	Inia 66 x 23584	26478-16Y-3M-1Y-0M	5		;2-	;2=	s;2,x	;2=		;2	X	
904	Cno "s" x 23584	26940-39M-1Y-0M	14	X	0	0;	;12	;12	X	;		
911	Cno-PJ 62	25093-30M-1T-1M-3Y-0M			0	;1	2‡3c	3-c	X	;		
915	23584 X Cno 67	26592-1T-22M-5Y-0M			s0,;	;2=	;2=	;2=	X	;2=		
920	23584 x Inia 66	26591-3T-11M-1Y-0M		X	0;	2	;1 2	;2		;		
922	NO66 x 23584	26481-6T-4M-6Y-0M	14	X	s;2,x	2=3-	x-	2+	X	;		
923	Jar-Cno/Tob 66 x Son 64-KlRend	26092-3T-1M-1Y-0M			0	0;	;1+	;	X	;2		
933	Cno^2-Chris	26520-28Y-6M-4Y-0M			0	;	2 3c	;12	X	;		
934	Cno^2-Chris	26527-33Y-6M-5Y-0M		X	0;	0;	s;1,;12	0;		;		
937	23584 x Inia 66	26591-3T-1M-5Y-0M		X	0	;	s;2=,x	;		;		

942	23584 x Cno 67	26592-1T-17-M-1Y-0M			0	s;,2=	;2=	;2=		;		X
946	Cno x 7 Cerros	25077-2M-7Y-5M-1Y-0M			;2=	;	sx‡,3	sx=,3	X	;2		
947	Bb #1		1,11,18		;	;1	x	;2	X	;2		
952	Cno "s" x Ska	26933-73M-4Y-0M		X	0	;	x	;2 3=	X	;		
958	Inia 66 x 23584	26478-7Y-8M-3Y-0M	11		;2≡	;2-	;22‡	2	X	;		
966	Cno^2- Chris	26527-1T-2M-2Y-0M		X	0	0;	s;,;2=	;		;		
968	Cno-Inia	25329-5T-15M-3Y-0M		X	;2=	;	x	x=		s;1,x-		
969	23584 x Inia 66	26591-3T-1M-2Y-0M		X	0	;	;2=	;		s;,;2		
973	Cno^2-Chris	26520-28Y-1M-4Y-0M			0;	0;	;2=2	;2	X	;		
975	23584 x Cno 67	26592-1T-21M-4Y-0M		X	0	;	;2=	;2=		s;,2		
989	23584 x Cno "s"	26592-1T-10M-5Y-0M			0	;2=	;12-	;2=	X	s;1,;2≡		
996	Tob 66 x Cno "s"	24908-53M-1Y-3M-1Y-0M		X	0	0;	;2	;2=		s;,x=		
1008	Son 64-Kl Rend/Cno "s" xLR 64^2-Son64	27139-30M-0Y		X	0	0;	;	;	X	;1		X
1010	Inia-Cno x Cal	27220-44M-0Y		X	0	0;	s;,;2=	;		;2=		
1011	Inia x 23584	26478-7Y-8M-0Y		X	;2=	;2=	;2	2 2+		;		
1012	Inia x 23584	26478-7Y-10M-0Y		X	;2=	;2-	;2	2		;		
1014	Cno^2 x Chris	26520-35Y-1M-0Y		X	0	0;	x	s;x2+		;		
1019	23584 x Cno 67	26592-1T-4M-0Y			0	;2-	s;2-,0;	s;,;2=		;2≡	X	
1020	Azteca 67		11		0	;	x‡	x	X	;	X	
1021	Cno x Inia	25329-1T-7M-0Y			s;12=,3=	2+3-	s1‡,3=	s2≡,2‡	X	;2≡		
1022	Cno x Inia	25329-5T-9M-0Y			3-	;	x‡	3-		;2=	X	
1025	Tob 66 x Cno "s"	24908-53M-1Y-4M-0Y		X	0	0;	2-	;2=		;2=		
1028	(Son64 x Tzpp-Y54/Son 64-Y50^5_ExGto)Cno"s"	24975-8M-3Y-1M-0Y		X	;2≡	;	;2=2-	;		;	X	
1044	Son 64-Y50EX Gto/Cno "s"	25023-7M-1R-5M-0M		X	0	s;,2	;2=	;		s;,x=		
1046	Cno "s"/Son 64-Y50$_E$x Gto	25342-7M-1R-3M-0Y	19	X	;	0;	;12=	;	X	;1,;2=		
1050	Bluebird	23584-18M-2Y-2M-0Y-2M-0Y			0	;2=	;2-	;2=	X	;2		
1052	Bleubird	23584-18M-2Y-2M-0Y-21M-0Y			0	;2=	;2	2 2+	X	;2		
1053	Tobari 66			X	0	0;	2+,x-	;2=2+		;2=		
1064	Cno^{2}xChris	26527-1T-2M-0Y		X	0	0;	s;2=,x	3=		;		
1068	Tob-Cfn x 23584	25973-13Y-1M-0Y	11	X	;2-	;	2	2		;2≡		
1083	Cno "s"(WT^3_E -Nar 59 x Sta.E./Jar "s"	27829-21Y-0M			;	;	;2=	;2=		;2≡	X	
1085	Bb #2 (Blanco)		7	X	s;2≡,3=	3-	;2=	x-		s;,x,3		
1091	Tobari 66		11,13	X	0	;	22‡	;1‡3=		;2		
1092	Tzpp-Son 64 x Tob66	27925-4Y-0M		X	s;,;2=x=	;2=	;2 2+	;2 3=		s;,;2,x		

TABLE 4.
(CONT')

No.	Variety or Cross	Pedigree	Yield 1/	Stem Rust					Leaf Rust		Stripe Rust	Septoria spp.
				Field Data	1	2	3	4	Field Data	Race 1		
1100	Cno "s"^{2}-Chris	28008-28Y-0M			0	;	;2=2	;		;1	X	
1119	El Cau-Pi62 x Son 64%El Gau-Son 64	29618-16-0M		X	0	;2 =	2-	2=		s;,;2,x		
1122	Cno "s" X SK-Cnn	686596-4Y-0M	19		0;	3-	;22‡	;2=		;	X	
1123	Cno "s" x Inia "s"^{2}	686596-5Y0M	6		0;	3-	;22‡	;2=		;	X	
1210	Cno "s" x Inia "s"^{2}	23959-13T-1M-5Y-0M			0	2 3-	2+	2=	X	;		
1213	Tobari 66			X	0	0;	x-	;1‡		s;,x=		
1216	Tob 66 x Cno "s"	25000-68M-2Y-2M-0Y	1		0;	0;	;1 2	;		s;,x-	X	
1217	Tob 66 x Cno "s"	25000-13M-3Y-2M-0Y		X	0;	;	s;2=,2‡	;		;2=		
1216	Kl. Rend-Son 64^{2}xInia "s"/Cno "s"	24970-29M-3Y-2M-0Y		X	0;	s;,2	;2=2	;		;		
1222	23586 x Cno "s"	26592-1T-17M-0Y		X	0;	;	;2=	;		s;,;2=		
1229	Son 64-Kl Rend/Cno "s" x LR64^2-Son 64	27139-75M-0Y	15,19		0,;	0;	;1+	2=2		=	X	
1232	Tobari 66	26478-7Y-9M-0Y		X	;2=2-	2-	2 2‡	;2 2‡		s;,;2		
1233	23584 x Inia	2659 1-10Y-3M-0Y		X	s0,;2=,x	s;,3	s2+,x	;22‡		;		
1235	Cno^{2}xChris	26527-1T-2M-0Y		X	0;	0;	s;2=,x,3	s;,2-2+		;		
1236	Son 64 -Y50E x Gto/Cno^2	25952-3R-1M-0Y	5	X	0;	0;	s;,x	s;2-,3		;		
1238	Tob 66 x Cno"S"	24908-53M-2Y-1M-0Y		X	0	;	2+	;2=		;2=2		
1240	7 Cerros	25000-38M-2Y-1M-0Y		X	0;	;	x-	2 2+		s;,;2=		
1244	Cno x Pj62	25093-30M-1T-2M-0Y	15	X	0	;	x‡	x		;		
1245	Bluebird	23584-26Y-2M-3Y-2M-0Y			;1	;	s2,x =,3	3=	X	s;,x=		