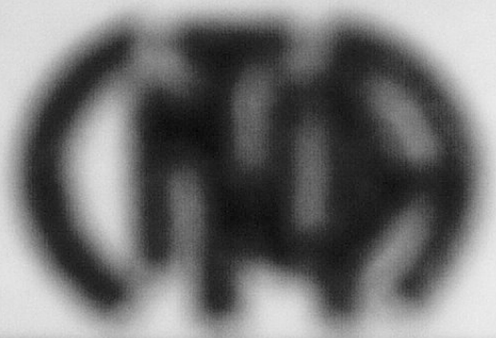

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PROCEEDINGS

THIRD REGIONAL WHEAT WORKSHOP

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

Tunis, Tunisia
APRIL 28-MAY 2, 1975

CONTENTS

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6

NEEDS OF DURUM WHEAT IN THE NORTH AFRICAN AND NEAR AND MIDDLE EAST REGIONS

G. Varughese

I. Place of Durums in the Region

Durum wheat occupies about 11.5 million hectares in the countries of the Mediterranean, Near and Middle Eastern region. These 11.5 million hectares are distributed: close to 5 million in the Near and Middle East, 3.5 million in North Africa, 2 million in the European part of the Mediterranean and about one million in Ethiopia. The proportion of durums to the total wheat area vary from country to country. In the countries of the Middle East and North Africa, durums constitute the major part of the wheat production. The area and production figures for individual countries are given in Table 1.

Table 2 gives the varietal distribution of the durums in this region*. Unimproved local varieties predominate in most of the countries. The current improved varieties in cultivation also do not have high yield potential. High-yielding varieties occupy a very low proportion of the area. Table 3 gives a list of high-yielding varieties under cultivation or multiplication as new varieties. Thus we can expect a change in the varietal pattern of the durum crop in this region.

Almost all of the durum crop is rainfed and is grown under an environment of high fluctuation (Table 4). In addition to this, in most of the countries the agriculture is still traditional. When traditional agriculture is coupled with high environmental fluctuations and unimproved varieties, the net result is low productivity.

II. Needs of the Region

a) Yield and yield stability

Durum wheat in the regions of North Africa and the Near and Middle East can be grouped into two major groups. The first group -- semi-winter wheat with some cold tolerance -- is needed for parts of afghanistan, Algeria, Iran, Iraq, Turkey and Tunisia. The second group -- spring durums -- are

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* Unless otherwise stated, region comprises the countries of North Africa and the Near and Middle East.

adequate for the remaining countries and parts of the above countries. Late frost and lack of adequate rainfall during the last phase of the crop or high evapo-transpiration during this period are very common to almost all the durum areas. Lack of consistency in rainfall distribution during the season and varied intensity of the winter season are still other factors to be taken into account. Thus the varieties must have adequate drought tolerance and a wide adaptation, in addition to high yield potential through semi-dwarfing, high fertility and bold seeds.

Earliness is one of the ways to escape drought. It is possible to achieve this through modifying any one of the different developmental phases of the crop. It may seem better to have a type with a long vegetative phase and a short reproductive phase. In other words, a long duration germination to tillering (flower initiation) and tillering to anthesis and a short anthesis to ripening period. However, more detailed analysis is needed and will require the help of either CIMMYT or some universities to look into this fundamental question, i.e. the role of different growth patterns in relation to drought.

Wide adaptability of a variety is another practical measure to face the high fluctuations in the environmental conditions. In the past, plant breeders resorted to testing the variety for a number of years to achieve this. However, this wide adaptation of a variety can be measured today much faster through the help of regional and international testing. Thus it would be wise on the part of national programs to make use of these regional and international nurseries.

Disease resistance is another important factor in stabilizing the yield potential. Table 5 gives the potential diseases, their distribution and the number of times each one has been a limiting factor in wheat production during the past 10 years. It is evident that stripe rust, stem rust and leaf rust are the most important diseases in common for almost all the countries of the region. Septoria, smuts and bunts constitute the second group of diseases. These are more prevalent in the Mediterranean region. Other diseases are also prevalent, but their importance is less in comparison with the rusts and Septoria.

Research input in durum development and screening for sources of resistance is fairly new. As a result, we do not yet have many varieties combining multiple resistance or varieties carrying different sources of resistance for a single disease. The last few Regional Insect and Disease Screening Nurseries (RDISN), the experience of the International Rust Nursery of the USDA and isolated efforts of a few plant pathologists and plant breeders have assembled a number of valuable data with respect to the sources of resistance to different diseases. A list of these sources is added in the appendix. Thus, we have a base available to work with. But most of these sources are present either in very poor agronomic types or are present in some of the sub-species of T. turgidum, so the incorporation of these traits to the cultivated forms will take time and much scientific effort. Unfortunately, many of the programs in the region are not well equipped to carry out such a task. Thus, it would seem appropriate for CIMMYT to devote some of their efforts towards developing parents and to distribute them to the national programs.

The RDISN is an excellent vehicle in the region for identifying new sources for disease resistance. The success of this depends on the sources of material which go into the nursery. I would strongly recommend that the FAO germplasm collection program channelize its collection through this nursery for a faster utilization. At the same time, there are many small collections of durums in existence in many breeding programs. These collections also need to be assessed on a wider scale for the benefit of these programs as well as for the region as a whole.

Progress towards developing high-yielding varieties of wider adaptability has been achieved in many countries. The role of high yield and stability depends not only on the varieties but on how we grow them. The last regional workshop's main topic was devoted to this subject. I am sure our agronomic colleagues will continue to help us in this venture.

b) Quality

Durum wheat is indigenous to this area and as a result it is the main cereal for many of the indigenous food preparations. In addition, countries of this region used to be one of the major exporters of durum wheat to Europe. The European market demands durum types with a very low yellow berry percentage and a strong gluten. Thus, tradition and the past export experience are the two major factors determining the durum quality today.

Table 6 gives a classification of the mode of use of durums in the region. It is surprising to see that only 15.5% of the total durums of the region are used for spaghetti or pasta products and yet that 15.5% determines the quality requirements of the durums. It is possible that the quality for couscous and bulgur may be similar to that of pastas. However, this aspect needs further investigation. The main use of the durums in many countries of the region is for different types of bread. I am sure that the bread-making quality and the spaghetti or pasta quality are not the same. Thus this aspect of quality also needs detailed analysis.

Technical capability with respect to the number of cereal technologists available, a lack of definition of quality and a lack of methods of screening are probably the biggest bottlenecks towards the development of varieties with stable high yield and quality. Of the 12 reporting countries only 4 are seriously involved in using cereal technology in durum breeding (table 7). Iraq, one of the four, grows only 12% of its wheat area under durums. Cyprus does not have a cereal technologist but the screening is carried out by the breeder. Thus, Tunisia and Morocco are the only countries among the major durum growers of this region with an active cereal technology program. Thus, unless the situation changes with respect to the availability of cereal technologists; cereal technology laboratories; the lack of definition of couscous, bulgur or bread-making quality and the lack of early generation screening for pastas, development of stable high yielding varieties with the desired quality or qualities will be slow in many countries of this region.

Export of the durums is without doubt one of the first priorities of many governments as and when surplus becomes available. But this is something which we are to look for in the future. For the present the need is to fill the import gap of durums used for bread making, couscous or bulgur. Thus, if high-yielding, well-adapted varieties are available, they can go into production and the export quality can be incorporated over the years.

III. Collaboration Possibilities

i) Needs of different countries are slightly different from one another. However, there are many factors in common among many of the durum-producing countries.

ii) The role of regional and international nurseries is discussed in the context of yield stabilization as a means of measure for wide adaptability and as a scale for disease measurement. Descriptions and objectives of these nurseries are available for all the participants. In addition to achieving yield stability, these nurseries are excellent means for exchanging germplasm.

iii) CIMMYT is the major distributor of germplasm for the durums today. If we can provide CIMMYT with the most promising varieties and parents and our suggestions of certain parents for use in crosses, we can further enhance the quality of segregating material being sent out of CIMMYT.

iv) The success of a breeding program depends on how wide a genetic base is available to work with and how strong the selection pressures are. It is possible that some of the advance material which is discarded may be good for another country. If the breeder feels so it would be good to keep a few of these and pass them on directly to those countries or submit them for the regional nurseries.

DEVELOPPEMENTS RECENTS DES RECHERCHES SUR LE BLE DUR EN ITALIE

A. Bozzini

RESUME:

On essaie de donner quelques informations sur l'histoire et le développement de la recherche du blé durum en Italie en mettant l'accent particulièrement sur la production, sur les études physiologiques et les aspects agronomiques de sa culture. En rapport avec les principaux problèmes liés à l'ideotype morphologique et physiologique du blé durum, de différents essais sont illustrés par une description des variétés suivantes produites dans les 30 dernières années, pour trouver le germoplasme adéquat à atteindre le but proposé. Les problèmes de qualité sont ensuite pris en considération; quelques uns d'entre eux doivent etre encore résolus, surtout si les techniques d'élevage sont prises en considération. Enfin, l'absorption de l'azote, les recherches du métabolisme et de l'accumulation des proteines sont affrontées, particulièrement en rapport à la réaction à la fertilisation de l'azote par des enzymes de base comme le nitrate reductase et protease.

Original: Anglais

TABLE 2. Durum Varietal Distribution

Country	Area 1000 ha	% Local	% Improved	% High Yielding	Name and percentage of the varieties
Afghanistan	467.2	90	0	10	Mouri (80), Local short durum (10), GVZ 285 (5),Anhinga (2), FB55 (1), Albatros (2).
Algeria	1,300.0	85	0	15	Bidi 17 (30), Oued Zenati (25), M.B. Bachir (15), Hedba (15), Jori (10), Cocorit (5).
Cyprus	40.0	0	90	10	Kyperounda (60), Psathas (20), Tripolitico (10), Capeiti (10).
Ethiopia	982.4	100	0	0	A mixture of tetraploid species
Iran	488.5	100	0	0	
Iraq	240.0	25	65	20	Roshgull (10), Sorgull (10), Radhawiy + Kroka (5), S. Capelli (65), Jori (20)
Jordan	190.0	20	80	0	F8 Selection (35), Hornani Nawawi (45), Locals (20).
Lebanon	17.0	30	65	5	Huarani 27 (25), S. Capelli (40), Jori (5), Locals (30)
Libya	180.7	0	55	45	Mahmoudi (55), Badri (15), Cocorit (15) Inrat (15)
Morocco	1,375.0	50	50	0	Kyperounda (80), BD 3225 =Biskri x Bouteille (1), BD 2909 = Oued Zenati (15), Zeramek (4) , BD 1658, BD 272.
Saudi Arabia	30.0	100	0	0	Lokaimy (60), Kolani, Sindiyan, Herita Kassem, Herita-Madimi, Numrah-Daiar, Guroba-Kassem, Heijazi-Ahmar, Samma
Syria	1,350.0				Hamari, Horani, Senator Capelli Shihani, Jori
Tunisia	817.0	Tr	65	35	Inrat 69 + Badri (35), Mahmoudi, Chili, Sy-Mahmoudi, Mah-Kokini, Roussia (65) Locals Trace
Turkey	2,200.0				Akbasak 073/44, Berkman 469, Kunduru 1149, Kunduru 414/44, Akpusana, Karakilcik 1133, Bagacak, Sorgull, Beyaziye, Hauran, Iskender, Sahman, Aveyk
Pakistan					Local type 1. Trace " " 2. 60% " " 3. 30% " " 4. 10%

* Data based on the reports given by the respective countries.

TABLE 3. High Yielding Durums of the Region in Cultivation, or likely to be released in the Region*

Variety	Countries
Cocorit **	Algeria, Cyprus, Egypt, Iraq, Lebanon, Saudi Arabia, Turkey, Morocco, Syria
Jori **	Afghanistan, Algeria, Cyprus, Egypt, Lebanon and Saudi Arabia, Syria
Capeiti **	Algeria and Cyprus
INRAT 69 **	Tunisia, Algeria and Libya
Badri **	Tunisia and Libya
GVZ 285**	Afghanistan
Anhinga **	Afghanistan
FB. 55 (Creso) **	Afghanistan
IT-07	Afghanistan
IT-09	Afghanistan
Ent. 234	Afghanistan
V. 229	Iraq
D. Durum S.15 x Cr"s"	Lebanon
Amal	Tunisia
Maghrebi	Tunisia
Gediz (LD357E-Tc^2 x Al"s")	Turkey
Gerardo	Iraq
GAB-125	Syria
Georgio-331	Syria

* Data Based on the reports given by the respective countries
** In cultivation

TABLE 4. Agro-Climatic conditions of the Durum in the Region*.

Country	Crop Season & Duration No. of days	Rain Average & Range mm	Rain during the season average and range: Pre-seeding	Seeding to Tillering	Tillering to Boot stage	Boot Stage to Mid-Dough	Intensity and duration of the winter	Type of Agriculture R-rainfed I-irrigated T-traditional M-modern	Average Yield q/ha
Afghanistan	Oct - June 240	350 250 - 500	0 0 - 0	150 100 - 200	100 100 - 150	25 20 - 40	Mod - Sev 3 months	I - 100 T - 100	18.0
Algeria	Nov.Dec-June.Jul 240	500 300 - 700	100 no consistancy 50 - 150	150 100 - 200	150 100 - 200	100 50 - 150	Mild+Sev 4	R - 100 T.70 M.30	6.2
Cyprus	Dec - June 200	300 100 - 450	30 0 - 50	130 50 - 200	70 30 - 100	70 20 - 100	Mild 2	R-90 I-10 T-5 M-95	11.3
Iraq	Nov - June 225	625 450 - 1000	0 0 - 40	400 300 - 500	40 0 - 50	150 50 - 300	Mod - Sev 4	R-100	11.3
Jordan	Nov.Dec-May June 210	350 250 - 400	50 30 - 60	130 80 - 120	120 80 - 120	50 30 - 60	Mild 4	R-95 I-5 T-95 M-5	7.4
Lebanon	Nov - July 260	500 300 - 700	60 40 - 100	100 70 - 150	300 200 - 400	50 30 - 70	Mod 4	R-75 I-25 T-75 M-25	11.8
Libya	Dec - June 190	300	50	100	100	100	Mod 4	R-100	3.5
Morocco	Nov.Dec-June July 240	400 240 - 680	40 22 - 80	180 130 - 300	120 80 - 200	60 10 - 100	Mild+Mod 2	T-99.5 I-0.5 T-75 M-25	10.0
Saudi Arabia	Nov15-Dec15 April20-May20 155	350 250 - 650					Mild 2	R-20 I-80 T-100 M-0	13.3
Syria	Oct15-30Nov 15June-31July 240	350 250-- 450	35 0 - 70	160 - 150	140 100 - 150	55 40 - 80	Mod 3	R-95 I-5 T-35 M-65	9.0
Tunisia	Nov - June Dec - July 230	200 - 1000	no consistancy				Mild+Mod 5	R-100 I-0 T-75 M-25	6.5
Turkey Central Plateau	NovDec-JulyAug 290	350 275 - 600	30 no consistancy	175	75	50	Mod - Sev 5	R-100 I-0 T-80 M-20	10.7
Turkey Coastal Region	Oct15-Dec15 June 1 - 15 210	650 500 - 900	60 no consistancy	250	250	150	Mild 3	R-100 I-0 T-60 M-40	11!1
Turkey South East	OctNov-JuneJul 275	480 300 - 600	5 no consistancy	295	130	50	Mod 3	R-99 I-1 T-60 M-40	10.5
Ethiopia	EndJuly-Sep15 Jan-Feb 200	750 400 - 1000	300 200 - 550	200 150 - 280	80 40 - 140	20 10 - 30	Very Mild 3	R-100 T-90 M-10	6.7

* Data based on the reports given by the respective countries.

TABLE 5. Distribution of Diseases in the countries of North Africa, Near and Middle East*
Order of importance in each country rated from 1 - 11. (Number of times the disease limited production during last 10 years)

Diseases	Morocco	Spain	Algeria	Tunisia	Cyprus	Central Plateau Turkey	Coastal Region Turkey	South East Turkey	Ethiopia	Libya	Egypt	Saudi Arabia	Lebanon	Syria	Jordan	Iraq	Afghanistan	Pakistan
Stem Rust	3	2(3)	4	3	1(1)	4	1(1)	5	1(10)	1	1	1(6-8)	3	2	2(1)	-	2	1
Stripe Rust	-	1(2)	2(2)	7	3(1)	1(1)	1(1)	3	3(7)	-	2	4	1	5	-	2	1(2)	4
Leaf Rust	1(2)	3(4)	3	6	2(1)	6	6	4	2(8)	2	3	3	2	3	-	1	5	2
Smut	1	-	6	2	Tr.	3	5	2	4(6)	3	-	2(6-8)	-	4	-	-	4	-
Bunts	5	-	5(1)	1	Tr.	2	7	1	4(6)	-	-	-	-	1	1(2)	-	7	-
Mildew	4	4(1)	7	7	5	-	4	-	5(5)	-	-	-	-	-	-	-	6	-
Septoria	2(2)	5(3)	1(3-4)	4	4	-	3(1)	-	4(6)	-	-	-	-	-	-	Tr.	3	-
Alternaria	-	-	10	-	Tr.	-	10	-	6(4)	-	-	-	-	-	-	-	-	-
Helminthosporium	6	-	9	-	Tr.	-	9	-	6(4)	-	-	-	-	-	-	Tr.	-	3
Root Rots and Fusarium	-	-	8	5	Tr.	5	8	6	5(5)	-	-	-	-	-	-	-	8	5
Others	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	-

* Data Based on the reports given by the respective countries.

TABLE 6. Durum use in some of the North African, Near and Middle East Countries*

Country	Production (1000 M.t.)	Pastas %	Bread %	Couscous Bulgur %	Others %
Afghanistan	841	20	60	8	12
Algeria	800	30	10	40	20
Cyprus	45	10	90	0	0
Ethiopia	658	35	5	0	60**
Iraq	270	40	50	10	0
Jordan	140	2	95	1	2
Lebanon	20	40	20	0	40
Morocco	1,500	7	85	5	3
Saudi Arabia	40	0	10	80	10
Syria	900	0	40	0	60
Tunisia	520	30	15	50	5
Turkey	2,400	10	60	30	0
TOTAL	8,133	15.50	50.25	18.50	15.75

* Data based on the reports given by the respective countries.

** Injera

TABLE 7. Technical Involvement and technical staff position in some of the countries of the North African, Near and Middle Eastern Region*

Country	% Durum wheat to total wheat	Number of Plant Breeders	Number of Plant Pathologists	Number of Cereal Technologists	Only varietal testing	Plant Breeding and Plant Pathology	Plant Breeding with Plant Pathology and Cereal Technology
Afghanistan	20	3	0	0		V	
Algeria	70	2	1	1		V	
Cyprus **	50	3	0	0			V
Ethiopia	90	10	4	0		V	
Iraq	12	5	0	3			V
Jordan	95	1	0	0		V	
Lebanon	32	2	1	0		V	
Libya	±70	2	4	1		V	
Morocco	75	3	0	3			V
Saudi Arabia	50	2	1	0	V		
Syria	67	3	0	0	V		
Tunisia	76	3	4	1			V
Turkey	26	15	8	1		V	

* Data based on the reports given by the respective countries.

** Plant breeder works on all the aspects of cereal improvement.

V - Organization of cereal improvement work.

Appendix

Some of the Durum varieties and lines with good resistance to Rusts and Septoria

a) Rusts

1 Khapli. 1
2 Yuma. 1
3 LD. 390. 1
4 Wells. 1
5 Lakota. 1
6 St. 464. 1
7 Beladi. 116. 1,2
8 Beladi. PI. 57662. 1
9 Gaza. 1, 2
10 Tremes Molle. 1, 2
11 Palestina. PI. 94701. 1
12 CI. 8155. 1
13 Kasuska. 1
14 Tai. 1
15 D-16. 1
16 D-56-1. 2
17 Kyperunda. 2
18 Rabicorno"s". 1, 2, 3
D. 31733-4m-3y-1m-0y
19 21563-Jo"s". 1, 2, 3
D. 31538-IL-0L-IA-0A
20 Jo"s" (GII"s"/61-130 x 60 - 115). 2, 3
D. 32864-7y-2m-2y-4m-oy
21 Jo"s" - Cr"s" x Gs"s" - AA"s". 2, 3
CM-9902-5m-oy
22 USA III - C x Cr"s". 2, 3
CM-532-0L-6A-0A
23 61.130 - Lds x GII"s". 2, 3
CM-547-0L-4A-0A

24 D. 68-5-3B-4A. 2, 3

25 21563 x BY_E - T_C5. 3
D.31544-IL-C_-IA-0A

26 Jo"s"/RD3 - 6 x Stw63. 3

27 GII"s" - 21564. 3
CM-83-0L-5A-0A

28 GAB - 125. 2

b) Septoria

1 Jaafri

2 Preto Amareleo

3 Lobeiro

4 Amarelejo

5 BD. 1645

6 Capeiti

7 Tremes Molle

8 Roussia

9 Lakota

NOTES

a) 1 = Stem Rust
2 = Leaf Rust
3 = Stripe Rust

b) Information obtained from the reports of Zitelli (Italy) and the RDISN Summaries.

c) LD. 390, Wells and Lakota carry the same genetic factor for the Stem Rust resistance, St. 464 has two factors for Stem Rust resistance and one is the same as Khapli. Beladi-116 seems to have three factors for Stem Rust resistance.

BESOINS DANS LE DOMAINE DU BLE DUR EN AFRIQUE DU NORD ET AU PROCHE ET MOYEN ORIENT

G. Varughese

RESUME:

I. L'importance du blé dur dans la région

(i) Superficie semée au blé dur et production par rapport à l'ensemble de la production céréalière de la région (Tableau 1).

(ii) Répartition des variétés de blé dur dans la région et classification de ces variétés selon les catégories suivantes: variétés locales, variétés améliorées et variétés à haut rendement (Tableau 2).

(iii) Conditions agro-climatiques sous lesquelles sont cultivées les blés durs dans la région (Tableau 3).

II. Besoins de la région

a) Rendement et stabilité dans les rendements

(i) Potentiel de rendement et sa relation aux caractéristiques agronomiques de la plante.

(ii) Stabilisation des rendements par le rythme de croissance de la plante.

(iii) Stabilisation des rendements par le moyen de types capables de s'adapter à des variations considérables dans les conditions climatiques.

(iv) Résistance aux maladies (Tableau 4).

b) Qualité (Tableau 5)

III. Possibilités de coopération régionale

(i) Chaque programme possède des objectifs, des priorités et des caractéristiques qui lui sont propres.

(ii) Si les besoins diffèrent d'un pays à un autre, il y a tout de même un grand nombre de facteurs qui restent les mêmes pour tous les pays.

(iii) Utilisation des essais régionaux et internationaux pour l'évaluation de la résistance des différentes lignées aux maladies et de leur rendement ainsi que du niveau de stabilité de ces rendements. Ces pépinières sont les suivantes: la Pépinière Régionale d'Observation des Maladies et des Insectes (RDISN), la Pépinière d'Observation Préliminaire (PON), l'Essai Régional de Rendements, l'Essai Régional du Rendement du Blé Cultivé en Sec, l'Essai International du Rendement du Blé Dur et les Essais Régionaux Uniformes de la FAO/IAEA. Ces pépinières sont organisées par la ALAD-CIMMYT/FAO, CIMMYT et FAO/IAEA.

(iv) Recommandation à CIMMYT d'utiliser certains parents prometteurs dans leurs travaux d'hybridisation extensive.

(v) Inclusion dans les pépinières régionales de lignées avancées susceptibles d'être éliminées d'un programme national de recherche mais qui seraient selon l'avis du sélectionneur intéressantes pour d'autres pays.

Original: Anglais

7

COMPTE RENDU SUR LE BLE DUR EN ALGERIE

L. Hachemi

La culture des céréales continue à être liée à l'influence des perturbations climatiques. A cet effet la réduction de l'écart entre la production et la consommation passe nécessairement par l'intensification des zones propices à la culture des céréales, et l'élimination progressive de celle-ci des zones marginales.

La culture des céréales restera à l'avenir d'une importance stratégique pour sa prédominance en matière de ressources nécaissaires pour l'homme des zones semi-arides.

6.000.000 hectares représentent environ la surface consacrée chaque année aux céréales en Algérie dont la moitié est amblavée et le reste en jachère avec une moyenne annuelle de superficie récoltée de 2,8 millions d'hectares.

Tableau I. Evolution des superficies récoltées, 1000 Ha.

Années	B.D.	B.T.	Orge	Avoine	T O T A L
1911-1930	1.120	270	1.230	230	2.850
1931-1950	1.100	400	1.130	200	2.830
1951-1970	1.200	420	1.000	100	2.720
1971	1.240	700	640	70	2.640
1972	1.340	890	800	80	3.100
1973	1.070	710	590	70	2.440
1974	960	690	550	60	2.260

Depuis 1970 il semble se créer un nouvel équilibre dans la répartition des superficies notamment par la regression des superficies en Orge et Avoine éliminées sur quelques zones marginales et une augmentation des superficies en blé tendre au détriment du blé dur dont les rendements très faibles en zones intérieures ne cessent de poser le

problème en termes économiques de rentabilité et d'amélioration de cette culture chère aux agriculteurs.

L'amélioration des rendements apparaît donc comme un des facteurs importants de croissance. Elle doit être au mesure de faire face au développement industriel, à la concentration urbaine et à la surface, à la courbe démographique.

Tableau II. Evolution de la production 1000 Qx.

Années	B.D.	B.T.	Orge	Avoine	T O T A L
1911-1930	5.500	2.100	7.600	2.000	17.200
1931-1950	5.700	2.700	6.000	1.600	16.000
1951-1970	7.700	3.700	6.600	700	18.200
1971	7.300	5.000	3.400	400	16.100
1972	8.700	8.400	6.000	400	23.500
1973	4.600	3.700	2.500	400	11.200
1974	5.000	4.200	2.800	300	12.300

L'influence du climat saisonnier sur la production globale est décisive si l'on se refère aux bilans de récolte. Ceux de ses quatre dernières années montrent bien cette dépendance de la production; son abondance et sa régularité sont sujettes à la répartition entre Octobre et Mai des précipitations ou de leur absence aux moments critiques.

Les gelées tardives vers la mi-Avril et les siroccos précoces (vent chaud du sud) dès les premières journées de Mai ne manquent aussi de contrecarrer les espérances de récolte.

De ces raisons multiples malgré les efforts ardus des programmes de développement depuis 1971 par l'introduction en Grande Culture de variétés semi-naines à haut rendement, a une cadence très rapide, il est difficile de noter l'augmentation de la production au cours des deux dernières campagnes 1973 et 1974 relativement sèches.

Ces conditions difficiles ne permettent pas encore, et notamment en blé dur, une amélioration sensible du rendement.

La présence de stocks sans cesse croissant de graines de mauvaises herbes, la difficulté de maitriser des méthodes modernes de travail du sol et de maintenance de la fertilité des terres entrainent à l'heure actuelle une perte sensible variant entre 30 et 60% suivant les secteurs de production.

Tableau III.

Années	B.D.	B.T.	Orge	Avoine	T O T A L
1911-1930	4,9	7,7	6,1	8,6	6,8
1931-1950	4,7	6,7	5,3	8,0	6,1
1951-1970	6,4	7,6	6,6	7,0	6,9
1971	5,8	7,1	5,3	5,7	6,0
1972	6,5	9,5	7,5	5,0	7,1
1973	4,2	5,2	4,2	5,7	4,8
1974	5,2	6,0	5,1	5,0	5,4

L'AUGMENTATION DES RENDEMENTS

Malgré la faiblesse des rendements, on sent qu'un effort d'amélioration est à noter par l'analyse beaucoup plus fine au niveau de microclimats ou une certaine maitrise des méthodes culturales et de l'utilisation des engrais commence à apparaître ainsi que l'introduction de nouveaux assolements du type Médicago-blé ou fourrage-légumes secs-blé, qui ont pour objectif l'intensification de la céréaliculture.

L'élimination des céréales des zones marginales au delà des 350 mm vers le Sud permettra une concentration d'effort sur ces cultures vivrières dans les zones de 400 à 600 mm.

L'utilisation de semences sélectionnées ne manquera pas aussi d'être un des moyens les plus sûrs et les plus les plus rapides à transformer l'état actuel des choses.

DEVELOPPEMENT DES BLES DURS

Le blé dur qui représente la moitié des superficies emblavées est et restera la céréale la plus cultivée en Algérie aux cours des décades à venir. Les besoins sans cesse croissant naissant d'une utilisation axquise depuis des siècles et multiforme domineront encore pendant longtemps le marché céréalier algérien.

Mais notre préoccupation actuelle est l'augmentation rapide du rendement à l'hectare par la mise en culture de variétés à potentiel élevé capables de supporter les aléas climatiques.

Nos variétés locales datant de plus de 20 ans sont très faibles sur le plan physio-pathologique. Variétés hautes sensibles aux rouilles (Puccinia) et à la Septoriose ont à leurs actifs les caractères de "Bons Semouliers" et de rusticité leur permettant de se plier aux exigeances locales.

Tableau IV. Caractères physio-pathologisues des blés durs cultivés

Variétés	Epiaison date	Hauteur(cm)	Pgt. Rouille noire	Pr. R. brune	Pr. R. jaune	Sept. trit.	Fusariose
Locales							
Hedba	27/4	150	S	S	S	MS/7	MS
Bidi	24/4	140	S	S	MR	S/8	MS
Oued Zenati 368	28/4	145	S	S	MR	S/9	MS
Mohamed Ben Bachir	28/4	155	S	S	R	MS/7	MS
Introduites							
Cocorit	25/3	85	MR	MS	R	MS/7	S
Jori C69	26/3	80	MR	S	R	S/9	S
INRAT 69	13/4	110	MR	MS	MR	MR/6	R
Montpellier (37856)	26/4	120	MS	S	MR	MS/7	MS
Triticompolonicum/Z.B.	24/4	140	S	S	R	MR/5	MR
Capeiti	2/4	120	S	S	MS	MS/7	S

L'AIRE DE CULTURE DE BLE DUR

La scupulation de blé dur par un acquis d'encouragement antérieur à sa culture se retrouve sur les trois zones que caractérisent les différentes isohytes de délimitation et sur le plan pédoclimatique des plaines littorales et sub-littorales argilo-calcaires de bonne pluviométrie jusqu'à la limite de la steppe.

Tableau VI, Les superficies par variétés, 1000 Ha

VARIETES		SURFACES
Locales		
	Heba 3	200
	Oued Zenati 368	300
	Mohamed Ben Bachir	200
	Bidi 17	400
Introduites		
	Cocorit 71	70
	Jori C69	130
	Montpellier 37256	Multiplication
	T. Polonicum/Z. B.	Multiplication
	INRAT 69	Multiplication
	Capeiti	Multiplication
	Total	1.300

Les variétés locales dont les caractèrent technologiques sont appréciables ne permetteront plus la suffisance de la production.

Les variétés introduites dont le potentiel est élevé ne peuvent pas supporter les conditions de sécheresse de nos zones de cultures. Cultivées en sec leur développement végétatif se trouve bouleversé par les différents facteurs d'un climat rude et exigeant.

Les variétés à hauteur normale telle que INRAT 69 n'échappent pas aux gelées de printemps et aux échaudages fréquents.

Ces considérations importantes nous ont poussé à concevoir un nouveau programme d'intensification et d'accélération de l'amélioration des blés durs.

L'objectif de notre programme est d'augmenter la production par un accroissement des rendements, en gardant tant soi peu le niveau de qualité caractéristique de nos variétés locales.

A BRIEF REVIEW OF DURUM WHEAT IN ALGERIA

L. Hachemi

RESUME:

Cereal production in Algeria covers an area of six million hectares half of which is planted to cereals annually and approximately 2.8 million hectares are harvested. The yields from this area have remained stagnant at about 1.8 million tons annually with yearly fluctuations from 0.1 to 0.5 million tons. Present deficits between production and consumption are 0.7 million tons for wheat. Present consumption is 1.5 million tons for durum wheat and 1.0 million tons for bread wheat.

The lower yields of durum wheat have caused a marked reduction in total area even though they have a higher selling price than bread wheat and are preferred by the farmer. Barley and oats areas have also been reduced in the marginal zones. This has dirupted the previous equilibrium among the cereal species which can only be corrected through increased yields.

Diverse climatic conditions, mainly poor rainfall distribution or very limited amounts, late frosts and early Siroccos, are of major importance in the deviations of production.

Also a major importance in wheat production are heavy weed populations causing 30 to 60% losses in yield. There is increased sensitivity for reducing weed populations and increasing yields with improved cultural practices and introducing new rotations of the Wheat-Medicago type. The major concentration of effort for improvement is presently in the areas with more than 350 mm annual rainfall.

Durum wheat represents half of the total cultivated cereal area and consumer demands will maintain its importance in Algeria. Required yield increases demand replacement of disease susceptible and lower yielding local varieties; however, their seed quality and adaptation should be maintained. No introduced durum varieties to date have adapted to the required vegetative cycle in the major cereal area on the high plateau with late frosts and early Siroccos.

An accelerated durum improvement program was initiated to develop genetic potential for high yield, disease resistance, seed quality, plant height, heading date and adaptation. The classical method of hybridization was chosen for improvement and the Mexican and Italian durums serve as our basic germplasm. Many crosses were made with the local varieties and are being further top-crossed and doublecrossed to combine certain desired characters and increase genetic diversity. We strongly feel that this approach will result in meeting our objectives for future durum wheat varieties and increasing annual production.

Original: French

FIN

VUES