



MICROFICHE N°

00292

République Tunisienne

MINISTRE DE L'AGRICULTURE

CENTRE NATIONAL DE

DOCUMENTATION AGRICOLE

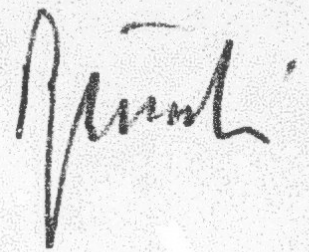
TUNIS

الجمهورية التونسية
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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

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DURUM WHEAT SITUATION IN TURKEY

P. Sölen, A.E. Fincit, C. Dutlu, and E. Alkus

Turkey grows approximately 8.6 million hectares of wheat with an average annual production of 10.5 million tons. Recent estimates indicate that 25% of this hectarage is devoted to durums, i.e. 2.2 million hectares. Durum wheat is grown throughout Turkey and the total area is distributed in approximately the following manner: 20% in the coastal or spring durum areas, 50% in the Central Plateau and winter durum areas, and 25% in the Southeast which is a facultative or spring durum region.

In Turkey in the last few years there has been a shift from growing durum to bread wheat and the introduction of high yielding bread wheat has been largely responsible for this shift. In the coastal areas Penjamo 62 and Lerma Rojo 64 have replaced most of the native durums grown in the valleys but native durums are still being grown on the hilly and more marginal lands. In Thrace, Bezostaya currently occupies approximately 80% of the total wheat area, whereas five years ago the region was 60% durum. In the Southeast the situation is much the same. Eight years ago the region grew probably 70-80% durum wheat but now Penjamo 62, Bezostaya, and other improved varieties are grown on most of the area and durums occupy only 30-35% of the total area. In the Central Plateau and winter wheat region the shift is not as dramatic but Bezostaya and other improved varieties have displaced some durum wheat acreage.

Durum wheat is widely used in bread and is also popularly eaten in many areas as bulgur, a cracked durum product similar to couscous. The production and consumption of semolina products is also increasing. Although many farmers have shifted from growing durum wheats to bread wheats, their consumptive habits have not had a corresponding change. Since consumption and consumer demand are increasing for durum wheat while supply is decreasing, a premium is currently being paid for durums in most sections of Turkey. To reverse this situation and increase durum wheat production, new high yielding durum varieties are urgently needed for the various regions in Turkey.

In the coastal regions, the main breeding problems are associated with disease resistance, i.e. stripe rust, stem rust, and Septoria. Leaf rust and mildew resistance are also desirable characteristics in certain regions.

The coastal regions are characterized by high rainfall (500 - 800 mm) falling mainly in the wheat growing season which is November to June. The winters are mild and the summers are hot and quite dry. Improved spring wheat varieties occupy approximately 60% of the coastal regions and Penjamo 62 is grown on about 90% of this area.

The spring durum breeding program is centered in Izmir and selection and testing are also conducted at Adana, Adapazari, Istanbul, and Samsun. This program has screened thousands of lines from CIMMYT and other countries. Generally the Mexican durums are high yielding and well adapted but lack resistance to one or more of the major diseases. Lines with resistance to one or more of the prevalent diseases have been isolated but generally these lines lack yield potential or adaptation. An extensive crossing program utilizing the native durums and the best introductions is currently trying to combine broad base resistance to the major diseases with wide adaptation and high yield potential.

After six years of intensive selection and testing, the first durum variety for this region will be ready for release in the 1975-76 season. The line, LD357_E - Tc² x AL"S" 27534-1M-1Y-1M-0Y, is tentatively being named Gediz I. It is moderately resistant to stripe rust and moderately susceptible to stem rust and Septoria. In two years of extensive trials it is approximately equal to Penjamo 62 in yield potential but is 80-100% higher in yield potential than the local durums. Its straw strength is good and its quality characteristics are acceptable. It is anticipated that Gediz I and another variety currently being released in the Southeast will soon occupy a sizeable portion of the durum area in the coastal region. Other promising lines are listed in Table 1.

The Southeastern region is characterized by moderately cold winters and hot, dry summers. The rainfall varies from 300 to 550 mm and falls from November to May. Both spring and winter wheat types can be grown in this area but currently spring types predominate. Average yields in this area are quite low and fluctuate widely from year to year. The farming practices in this region are still predominately traditional. Improved agronomic practices such as efficient weed control, better moisture conservation and seedbed preparation, and more efficient fertilizer use would significantly increase yields.

Since this region was once 75% durum and since there is a definite farmer preference for durum wheats, the breeding program for this region located in Diyarbakir has concentrated on the improvement of durum wheats. The main breeding objectives are earliness of maturity and adaptation to the hot, dry conditions characteristic of this region. Rust diseases seldom cause appreciable yield losses.

In 1974-75, Cocorit 71 was recommended for release in this region under the name of Dicle I. In three years of extensive tests, Dicle I has consistently outyielded the local durums of this region by 30-50% and is also 10-15% superior to the best bread wheat, Penjamo 62. It has consistently outyielded the best winter wheat variety, Bezostaya, by 25-30%. Dicle I is also being

recommended for release in the coastal areas where it has proved to be slightly superior to Gediz I in yield potential. However, Gediz I is somewhat superior in disease resistance and will be pushed where disease could become serious. Another fault of Dicle I is its tendency to yellow berry but this is not considered serious since it will be used primarily in making bread and bulgur. Current indications are that Dicle I will be readily adopted by the farmers of the Southeast and may soon replace a sizeable area currently being devoted to bread wheats.

Other promising lines for the Southeastern region are listed in Table 1. The two Dicle sibs designated as Dicle III and Dicle IV are very promising and are currently being considered for release. They are both similar to Dicle I in agronomic type but Dicle III has been consistently higher yielding and Dicle IV has equal yield potential but larger kernels and less yellow berry than Dicle I.

On the Central Plateau and in the Transitional Zones the winters are cold and the summers are warm. The average rainfall is 350-450 mm and is received from October to early June. The climate of this region is characterized by large fluctuations from year to year and from region to region. The farming in the region is still quite traditional but mechanization is increasing. The principal increase in yield in this region will be attained through improved agronomic practices such as better weed control, fertilizer usage, and more efficient water conservation. New varieties are also needed which will be better adapted to the highly variable conditions encountered in this region.

The durum varieties currently grown in this region are tall, weak strawed types with low yield potential and they are generally susceptible to all of the major diseases. Since the winters are long and cold, winter wheats with good levels of winterhardiness predominate. Unfortunately, most of the native durum varieties are facultative (semi-winter) types with moderate to low levels of winterhardiness, which occasionally results in winterkill or reduced winter survival.

The two breeding programs for this region are located at Ankara and Eskisehir. These breeding programs are making extensive use of the spring x winter x winter concept in their effort to isolate types with better yield potential, disease and cold resistance, and drought tolerance. In these breeding programs a spring durum (generally a Mexican durum) usually serves as the source of high yield potential. Durums from Turkey, Russia and Eastern Europe serve as the winter parent but unfortunately none of these durums have high levels of winterhardiness. True winter hardy durum parents would facilitate the recovery of types with good cold resistance. The winter parents are effective sources of drought resistance or tolerance and generally are sources of resistance to one or more of the prevalent diseases.

Six lines have recently been submitted to the National Testing Organization for final evaluation and these are listed in Table 1. The two BY_E^2 -Tc

lines have good yield potential but lack winterhardiness. The other lines have displayed superior yield potential in preliminary tests and have reasonable cold resistance.

In summary, the current demand for durum wheat in Turkey is high and supply is not meeting demand. To reverse this situation, an aggressive extension program is needed to demonstrate improved tillage and agronomic practices to the millions of wheat farmers in Turkey. If this extension effort could be coupled with an aggressive wheat research effort, the main problems could be overcome within a short period of time.

DISCUSSION

Question: The list of promising wheat varieties presented in your paper include some varieties with high rust and Septoria records. Are these promising for yield only, regardless of resistance? and what degree of resistance do you require for recommending and releasing a variety?

Answer: First, the reason for these high readings was having a very high artificial epidemic. These promising lines were selected mainly for yield. Even with high disease readings they yielded 80-100% over standards or local checks. This does not mean that in our selection we ignore disease resistance. These promising lines are the first in a coming program. In Table 1 you will note that some of the Gediz I sisters are better than others in disease resistance.

Table 1. Lines used in the Turkish breeding program.

Promising Lines from the Coastal Area of Turkey

<u>Cross and Pedigree</u>	<u>Disease Reaction</u>		
	<u>P.s.</u>	<u>P.g.t.</u>	<u>Septoria</u>
LD357E - Tc ² x AL 'S' = Gediz I 27534 - 1M - 1Y - 1M - 0Y	10S	10MS	8
LD357E - Tc ² x AL 'S' = Gediz I 'S' 27534 - 13M - 4Y - 1M - 0Y	5S	90S	5
LD357E - Tc ² x AL 'S' = Gediz I 'S' 27534 - 3M - 1Y - 2M - 0Y	10S	90S	8
LD357E - Tc ² x AL 'S' = Gediz I 'S' 27534 - 14M - 1Y - 8M - 0Y	20S	10MR	8
LD357E - Tc ² x AL 'S' = Gediz I 'S' 27534 - 14M - 1Y - 4M - 1S - 0S	10S	60S	8
61-130-Lds x G11 'S' / AA 'S' CM498 - 1S - 0S	60S	20MS	7
Jo 'S' - Cr 'S' 27591 - 5M - 3Y - 1M - 0Y	0	80S	8
Cr 'S' - Gs 'S' CM224 - 49M - 1Y - 1M - 0Y	20S	60S	8
Cocorit 'S' 27617 - 18M - 3Y - 0M	60S	30MS	8
Pinguino 'S' 28984 - 52Y - 2M - 500Y - 0M	0	20MS	4
Pinguino 'S' 28984 - 62Y - 2M - 1S - 2S - 0S	0	20MS	6
USA IVA - Ci 'S' CM9628 - 2S - 0S	10S	15S	8
Plc 'S' - Jo 'S' 31769 - 4M - 2S - 0S	10MS	70S	8
21564-AA 'S' (D. Buck x D# 2E - Tc ² / Lak) 28951 - 3Y - 3M - 4Y - 0M	15S	10MR	8
Anhinga 'S' 22234 - 52M - 3Y - 1M - 0Y	80S	15MS	8

Promising Lines from the Coastal Area of Turkey (Cont'd.)

<u>Cross and Pedigree</u>	<u>Disease Reaction</u>		
	<u>P.s.</u>	<u>P.g.t.</u>	<u>Septoria</u>
Gaviota 'S' 31725 - 3M - 8Y - 1M - 0Y	0	20MR	8
AA 'S' - Cr 'S' x Ci 'S' CM10187 - 15S - 0S	20S	40MS	6
Flamingo 'S' 27582 - 8M - 13Y - 1M - 0Y	15MS	5MS	4
Akpusana (Local check)	25S	30S	4

P.s. = Stripe rust P.g.t. = Stem rust

Promising Lines in the Southeastern Region of Turkey

<u>Variety or cross</u>	<u>Pedigree</u>
Cocorit 71 = Dicle I	
Dicle I "S" = (Dicle II)	27617 - 18M - 6Y - 1M - 0D
Dicle I "S" = (Dicle III)	27617 - 18M - 6Y - 2M - 0D
Dicle I "S" = (Dicle IV)	27617 - 9M - 5Y - 5M - 0Y
BY _E ² - Tc x TAC _E - Tc ⁴	29595 - 2M - 1Y - 1M - 0Y
Gediz I and Sister Lires	
Few Flamingo, Stork, and Rabicorno Sibs	

Promising Lines in the Central Plateau of Turkey

<u>Variety or Cross</u>	<u>Pedigree</u>
BY _E ² - Tc	22252 - 15A - 2A - 8A - 0A
BY _E ² - Tc	22252 - 15A - 1A - 14A - 0A
61-130-414/44	1A - 24A - 0A
Uveyik 162-61-130	16A - 1A - 0A
Uveyik 162-61-130	17A - 3A - 0A
Uveyik 162-61-130	39A - 1A - 0A
377/2	
1229/1	
13-Hamari	

SITUATION DU BLE DUR EN TURQUIE

P. Sölen, A.E. Firat, C. Dutlu et E. Alkus

RESUME:

En Turquie, la production annuelle de blé est de 10.5 millions de tonnes pour une surface cultivée de 8.6 millions d'hectares. De récentes évaluations ont indiqué qu'environ 25% de cette superficie était consacrée au blé dur, à savoir 2.2 millions d'hectares. Les zones cultivées en blé dur en Turquie sont réparties approximativement de la façon suivante: 20% dans les régions côtières (régions du blé dur de printemps), 55% sur les plateaux du centre (régions à blé dur d'hiver) et 25% dans la région du Sud-Est (région de blé dur de printemps ou de blé demi-hiver).

Au cours des dernières années, il y a eu une tendance à remplacer la production de blé dur par celle de blé tendre. L'introduction de variétés à haut rendement telles que le Penjamo 62, le Lerma Rojo 64 et le Bezostaya a largement contribué à ce changement. Pour contrecarrer cette tendance et augmenter la production de blé dur, on a absolument besoin de nouvelles variétés de blé dur à haut rendement pour les diverses régions de la Turquie.

Dans les régions côtières, les problèmes majeurs concernant la création de nouvelles variétés sont dus à la résistance aux maladies telles que la rouille jaune, la rouille noire et la Septoriose. Un programme intensif de création de nouvelles variétés est en cours depuis cinq ans à Izmir et en 1975-76 on sera en mesure de mettre sur le marché une nouvelle variété de blé dur; le Gediz I - LD357²xAL"S". Cette lignée représente une résistance modérée à la rouille jaune et est modérément prédisposée à la rouille noire et à la Septoriose; elle équivaut à Penjamo 62 en ce qui concerne le potentiel de rendement, mais possède un potentiel de rendement supérieur de 80 à 100% à celui des variétés locales de blé dur. Plusieurs autres lignées sont tout-à-fait prometteuses et devraient être commercialisées dans les deux ou trois prochaines années.

Dans le Sud-Est, les principaux objectifs du programme de création de nouvelles variétés sont de trouver des variétés qui mûrissent tôt et qui peuvent s'adapter aux conditions climatiques de la région, à savoir, la sécheresse et la chaleur. Dans cette région, la rouille ne présente pas de problèmes sérieux. En 1973-74, la station d'expérimentation située à Diyarbakir, a commercialisé une variété, le Dicle I, équivalant au Cocorit 71.

Cette variété a constamment donné un rendement supérieur de 30 à 50% comparativement aux variétés locales de blé dur dans cette région et a même dépassé de 10 à 15% les rendements d'une des meilleures variétés de blé tendre, le Penjamo 62. Bien que le potentiel de rendement de Dicle I soit excellent la qualité de la graine ne l'est pas; elle présente une tendance à metadinage. A cause de cet inconvénient, on s'efforce de trouver de meilleures variétés et plusieurs lignées semblent extrêmement prometteuses, par exemple deux soeurs de Cocorit que l'on désigne sous le nom de Dicle III et Dicle IV. On pense que ces variétés et d'autres nouvelles variétés remplaceront bientôt les variétés locales de blé dur actuellement utilisées.

Sur le plateau Central, on sème des variétés de blé dur à tiges longues, et à paille faible qui donnent un faible rendement et sont prédisposées à toutes les maladies. La majorité de ces variétés sont des types demi-hiver peu résistantes au froid. Un important programme d'amélioration a été mis en place dans les stations d'expérimentation d'Ankara et Eskisehir où l'on essaie d'isoler des variétés à haut rendement, plus résistantes aux maladies et au froid. Pour cette région, il faut également tenir compte des facteurs suivants: résistance et tolérance à la sécheresse, ou une meilleure utilisation de l'eau. Etant donné la variabilité des caractéristiques agro-climatiques du Plateau Central, la tolérance à la sécheresse et une grande adaptabilité des variétés sont cruciales pour obtenir un rendement stable.

Six lignées ont été soumises à l'Organisation Nationale de Contrôle pour une commercialisation éventuelle. Dans ce groupe, on trouve deux lignées obtenues à partir du croisement BY₂E -Tc (II-22252), une lignée à partir du croisement 61-130-414/44, et trois selections locales 377/2, 1299/1 et 15-Ha-mari, qui semblent supérieures aux variétés actuellement plantées. Un programme intensif de croisement est actuellement en train d'essayer de transférer le haut potentiel de rendement du blé dur mexicain aux types adaptés au Plateau Central; cependant, cet effort est entravé par la nécessité de trouver du blé dur d'hiver local ayant les caractéristiques requises.

Original: Anglais

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