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Results of durum wheat (*Triticum turgidum* L. var. *durum*) breeding in Szeged, Hungary

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SUMMARY – The main result of the durum program of Cereal Research Non-Profit Company (CRCo) is that the durum wheat was successfully domesticated in Hungary. Now the acreage of durum wheat in the country is about 10,000-14,000 ha, and this area is changing from year to year. The registered winter durum cultivars of CRCo are the following: GK Minaret, GK Tiszadur, GK Novodur and GK Bétadur. These winter durum varieties yield generally only 15-30 % less than the most widely produced winter bread wheat cultivars (*T. aestivum* L.). Spring durum wheat varieties (Lajtadur, Semperdur and Multidur) were adapted from Austria and France. Their productivity is 45-50% less than the mean yield of winter-type bread wheat.

Key words: Durum wheat, breeding, grain yield, quality.

RESUME – “Résultats de l’amélioration du blé dur (*Triticum turgidum* L. var. *durum*) à Szeged, Hongrie”. Le plus important résultat du programme de recherches de notre société (Cereal Research Non-Profit Company) est que le blé dur était acclimaté en Hongrie. Le blé dur est produit maintenant à peu près sur 10 000-14 000 hectares en Hongrie et cette surface change d’année en année. Nous avons 4 variétés de blé dur d’hiver inscrites au catalogue officiel : GK Minaret, GK Tiszadur, GK Novodur et GK Bétadur. La productivité de ces variétés de blé dur est seulement de 15-20% moindre que celle des variétés de blé tendre (*Triticum aestivum* L.). Trois variétés de blé dur de printemps (Lajtadur, Semperdur et Multidur) étaient introduites de l’Autriche et de France. Leur productivité est 45-50% moindre que le rendement moyen des blés tendres de type d’hiver.

Mots-clés : Blé dur, amélioration, rendement, qualité.

Introduction

The selection and production of winter durum wheat had no tradition in Hungary. In 1972 breeding project was initiated at the CRCo. The aim of this work was to select and introduce winter-type durum lines which:

- (i) Have a considerably high productivity close to that of bread wheat.
- (ii) Adapt themselves to the Hungarian conditions (winter hardiness, drought tolerance, disease resistance).
- (iii) Meet the quality requirements of pasta industry (Beke and Szebellédy, 1981).

The aim of this study is to show the results of durum wheat breeding and some results of Hungarian durum production.

Materials and methods

The work started with the selection of segregated materials originated from CIMMYT, Ankara. All selected lines were evaluated for winter hardiness, productivity, lodging and pasta quality. The result of this program was the registration of the two very first durum wheat varieties (GK Minaret, GK Basa) in 1980 (Beke and Barabás, 1981). In the mean time new basic materials were created by crossing Italian, French, Russian, Rumanian and Slovakian durum wheat lines, the germplasm of which were suitable for Hungarian climatic conditions. These lines were included in our pedigree breeding program. In the younger, segregating generations (F3-F5) we select on the base of the visual scoring of morphological

and phenological characteristics that are advantageous under our conditions. This selection is running parallel with the yield tests too.

At last among the high yielding and stress tolerant lines we will find the most tolerant and productive ones which could perform well in official trials too.

Results and discussion

After one decade 4 registered, patented cultivars (GK Pannondur, GK Tiszadur, GK Novodur, GK Bétadur) were selected from this breeding material. The new cultivars' winter hardiness and productivity is much better than those of GK Basa and GK Minaret.

Three spring durum varieties, two from Austria (Lajtadur, Semperdur) and one (Multidur) from France were introduced to widen the biological background of durum wheat production of the country.

The average grain yield of registered winter-type durum cultivars of CRCo was 4.98 t/ha in the field trials of National Institute for Agricultural Quality Control between 1995-1999. Winter durum wheat varieties yield generally 15-30% less than the yield of winter bread wheat (Fig. 1). The grain yield of spring varieties 45-50% less than that of the winter bread wheat cultivars.

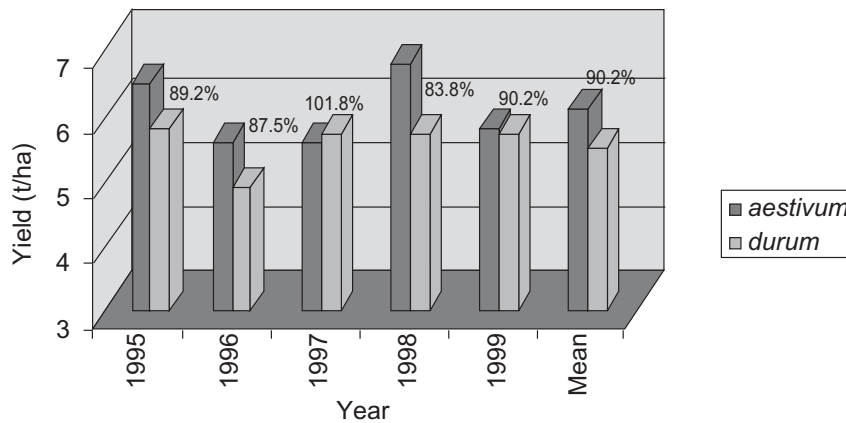


Fig. 1. The yield of durum wheat compared with the common wheats in Hungary (OMMI official trials).

The quality of Hungarian durum wheat meets the requirements of the pasta industry. The main quality parameters are shown in Table 1.

Table 1. Mean quality data of durum wheat varieties

Varieties	GK Minaret	GK Tiszadur	GK Novodur	GK Bétadur
1000 kernel mass	45-50	36-40	40-45	45-50
Test weight/kg	75-80	75-80	75-80	80-85
Falling number/sec	280-330	270-300	270-300	300-350
Vitrousness (%)	60-75	60-75	60-70	75-90
Semolina yield (%)	55-62	55-62	55-60	60-66
Ash of semolina (%)	0.7-0.8	0.7-0.8	0.7-0.8	0.6-0.7
Wet gluten cont. (%)	30-34	28-32	28-32	30-35
Dry gluten cont. (%)	12-13	12-14	12-14	11-13
Gluten extension Mm2	4-6	3-5	2-3	3-6
Pigment c. ppm.	7-9	6-8	6-8	8-10
Minolta value	24-27	23-25	20-23	25-27

Wet gluten content is over 30%, yellow pigment content is also high. Quality of GK Bétadur and GK Minaret is better than GK Tiszadur and GK Novodur.

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