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in

Royo C. (ed.), Nachit M. (ed.), Di Fonzo N. (ed.), Araus J.L. (ed.).
Durum wheat improvement in the Mediterranean region: New challenges

Zaragoza : CIHEAM
Options Méditerranéennes : Série A. Séminaires Méditerranéens; n. 40

2000
pages 153-156

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SUMMARY – This review examines the history of creation and modern condition of the *durum* wheat collection, its taxonomic and geographic diversity. Problems of plant genetic resources documentation are considered. Description of the passport database structure is given. The paper introduces an intraspecific systematic of *T. durum* Desf. which was designed in the Department of Wheats, VIR. The main durum breeding centers of Russia and the list of new cultivars are presented.

Key words: Collection, accessions, database, geography, taxonomy**,** breeding.

RESUME – *"La collection de ressources génétiques globales de blé dur au VIR". Cette synthèse examine la chronologie de la création et l'état actuel de la collection de blé dur, sa diversité taxonomiqueicoloque, géographique et les variétés, présente les directions générales des recherches. On envisage les problèmes de la documentation des ressources génétiques végétales. On donne la description de la structure de passeport de la base de données. On étudie la classification d'espèces de* T. durum *Desf., qui est élaborée à la section du blé, VIR. On présente les centres essentiels de sélection de blé dur de la Russie et la liste des nouvelles sortes.*

Mots-clés : *Collection, un échantillon, base de données, géographie, taxicologie, sélection.*

Introduction

Ex situ collection plays the important role in conservation diversity of cultivated plants and related wild species, and also in usage of diversity in breeding and in fundamental researches in the spheres of botany, evolution, plant phylogeny and taxonomy genetics. At VIR the global *ex situ* collection of wheats is assembled.

Database of wheat genetic resources at VIR

Documentation plays the role of common service at all levels of plant genetic resources (PGR) work. Documentation follows all PGR activities: sample gathering (passport information), description of sample (characterization and evaluation), conservation of sample (storage information). Database is the information in the electronic form, formatted and structured. Crop descriptor categories are as follows: passport, environment, management, characterization and evaluation. For each category there can be a separate database with a structure of its own.

In 1995, a computer database "Passport" was created and currently it undergoes further development at the Department of Wheats. It is the unified electronic directory of the passport information of the VIR's wheat collection. Structure of the database follows guidelines of the ECP/GR Wheat Working Group. The fieldnames are similar to suggested fieldnames which are developed jointly by IPGRI and FAO (Lipman *et al.,* 1997).

Structure of the database "Passport" includes the following fields: ACCENUMB, SPECIES, VARIETY, PLOIDY, ACCNAME, ORIGCTY, COLLSITE, DONORCODE, DONORNUMB, OTHERNUMB, COLLDATE, SAMPSTAT, GRCLASS, AVAILAB.

Information from some of the above fields can be represented in two ways: as the complete information and its code. In this case it is necessary to use the encoding tables. This database has 6 encoding tables to encode the following fields: scientific name, country of origin, donor country, donor institute, status of accessions, growth class. Accessions of *durum* wheat may be retrieved by the word

"durum" in the field "SPECIES" or by the appropriate code in the encoding table "TAXONOMY" in an interval from 951 up to 1123. The total number of entries in the "Passport" database makes today 35500, out of which about 6000 are *durum* wheat. A copy of this database was submitted in 1998 to the ECP/GR Wheat Working Group engaged in the creation of the European Wheat Database and placed on the Internet *(http://genbank.vurv.cz/ewdb)*.

Geographic diversity of accessions in durum wheat collection at VIR

The wheats collection was started at the beginning of this century by the Bureau of Applied Botany set up in 1894. The first foreign samples were introduced from collections of agricultural organizations and botanical gardens from Germany, England, and the USA. The Bureau received Russian landraces from agricultural exhibitions and separate breeders. In the 1920's-1930's N.I. Vavilov organized expeditions to collect plant samples and explored many regions in the USSR and abroad. Expeditions of N.I. Vavilov (Spain, Portugal, Italy, Greece, Algeria, Tunisia, Morocco, Cyprus, Crete, Sicily, Sardinia, Syria, Palestine, Transjordan, Egypt), of P.M. Zhukovskiy (Turkey), of V.V. Markovich (India, Pakistan), of E.N. Stoletova (Armenia, Georgia), of N.N. Kuleshov (Azerbaijan) have considerably enriched the collection of *durum* wheat.

Today the *durum* wheat collection totals 5897 accessions from all regions of origin and cultivation of the crop. Over 45% of all accessions are those from the Mediterranean (Tables 1 and 2).

Table 1. Geographic diversity of accessions in the VIR's durum wheat collection

Origin	Number of countries	Total accessions in VIR's collection	Accessions included in the collection before 1939	
			Number	%
Europe	20	1429	365	26
Asia	23	2629	1419	54
Africa	11	673	407	60
America	9	477	27	5
Australia	2	15	7	46
Russia	1	674	372	25.5
Total	66	5897	2669	45

Table 2. The Mediterranean countries represented in the VIR's durum wheat collection

Country	Total accessions in VIR's collection	Accessions included in the collection before 1939	Country	Total accessions in VIR's collection	Accessions included in the collection before 1939
Portugal	108	37	Lebanon	7	7
Spain	125	69	Syria	133	101
France	66	6	Turkey	869	407
Italy	361	105	Egypt	36	26
the Balkans	53	10	Libya	1	1
Greece	88	51	Tunisia	176	88
Israel	15	0	Algeria	247	181
Palestine	223	223	Morocco	164	81
Cyprus	86	78			
		Total	17	2758	1471

Interest in accessions included in the collection before 1939 has grown at present. It is explained by the interest of modern researchers in old landraces and primitive cultivated wheats from the point of view

of their potential use in breeding. Indigenous varieties of folks selection possess very important characteristics: frost resistance, drought resistance, resistance to diseases and pests, etc., thus making up the precious pool for breeding.

Taxonomic diversity of *Triticum durum* Desf.

The Department of Wheats, VIR treats *T. durum* Desf. as a separate species (Dorofeev, 1979). It contains 2 subspecies: subsp. *durum* and subsp. *horanicum*. The morphological character "spike density" is the primary one for defining the largest subdivisions, such as subspecies. Subsp. *horanicum* Vav. shows the highest spike density. Subsp. *durum* – the *durum* wheat proper – is characterized by a major variation of spike density, grain size and form. The subspecies also has liguleless forms and those with strongly pubescent leaves. The subsp. *durum* is represented by 6 groups of varieties (convar.): *durum*, *durocompactum*, *aglossicon*, *villosum*, *falcatum*, *caucasicum*. Besides, convar. *durum* is differentiated into 9 ecological groups. Among them there is a Mediterranean ecological group – T. *durum* prol. *eumediterraneum* Vav., inside which 5 ecological subgroups (Jordanian, Middle Eastern, Sardinian, Portuguese, and the Atlas mountain) are identified. The total within *T. durum* Desf. amounts to 120 varieties.

Durum wheat breeding in Russia

Durum wheat breeding in Russia started in the 1910's. Main areas of *durum* wheat cultivation are the Volga Region, the Urals, Central Chernozem Region, Northern Caucasus, Western Siberia. The breeding centers specializing in this crop are given in Table 3.

Table 3. The main Durum Breeding Centers of Russia

Breeding center	Location	Special breeding programs	
		Spring *durum*	Winter *durum*
Research Institute of Agriculture for the Central Chernozem Region	Voronezh Region	Yes	Yes
Krasnodar Research Institute of Agriculture	Krasnodar Territory	Yes	Yes
Donskoy Research Institute of Agriculture	Rostov Region	Yes	No
Stavropol Research Institute of Agriculture	Stavropol Region	Yes	Yes
Samara Research Institute of Agriculture	Samara Region	Yes	No
South-East Research Institute of Agriculture	Saratov Region	Yes	No
Kurgan Research Institute of Agriculture	Kurgan Region	Yes	No
Orenburg Research Institute of Agriculture	Orenburg Region	Yes	No
Bashkiriya Research Institute of Grain Crops and Breeding	Bashkiriya	Yes	No
Altai Research Institute of Grain Crops and Breeding	Altai Territory	Yes	No
Siberian Research Institute of Agriculture	Omsk Region	Yes	No

The main factors limiting cultivation of durum wheat are drought, diseases and saline soils. As a result of breeding, in recent years new cultivars of durum wheat have been included in the State Register of breeding achievements. Among them are Voronezhskaya 7, Steppe 3, Leucurum 21, Pricumchanka, Bezenchukskaya 182, Bezenchukskiy yantar, Valentina, Saratovskaya zolotaya, Zarnica Altaya, Angel, Omskaya yantarnaya. They have been included in the collection of durum wheat at VIR.

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