

TURKISH NATIONAL EXPERIENCES ON THE PLANT GENETIC RESOURCES (Berries)

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The **Turkish** Ministry of Agriculture and Forestry coordinates and implements agricultural **R&D** activities through the General Directorate of Agricultural Research and Policies (TAGEM).

Missions of TAGEM

- Increasing yield and quality
- Developing new varieties and technologies
- Conserving genetic resources and ensuring sustainable use of them

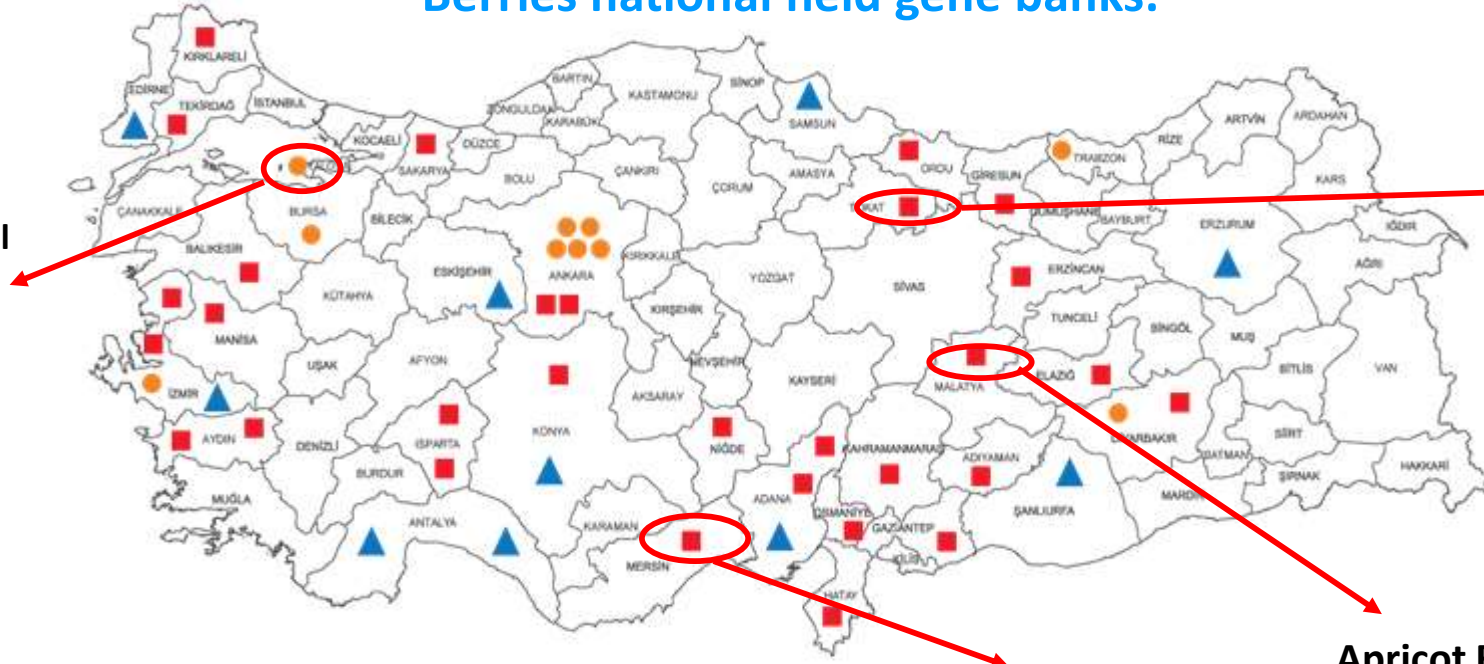


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Berries national field gene banks.

Atatürk Horticultural Center Research Institute YALOVA.



Middle Black Sea Transitional Zone Agricultural Research Institute TOKAT

Apricot Research Institute MALATYA

Alata Horticultural Research Institute MERSİN.

- 10 Central Research Institutes
- ▲ 10 Regional Research Institutes
- 28 Crop/Subject Oriented Research Institutes

- ✓ Turkey's geographical location covers Mediterranean, Europe-Siberian and Western and Asian bio-geographical regions.
- ✓ Turkey consists of three different biogeographic regions, each with its own endemic species and natural ecosystems.
- ✓ These are: the Caucasian mountain forests with the temperate deciduous forest, including alpine meadows; Central and Eastern Anatolian Steppe grasslands and the Mediterranean region, which includes the World's largest remaining Cypress forests. The steppe ecosystem is perhaps the most important of all from the point of view of economics, as a large number of food crops have been derived from their wild species native to Turkey.





- ✓ Biodiversity conservation, ex situ and in situ, of plant diversity is conducted within the framework of ***“National Program on Conservation of Genetic Resource/Diversity” since 1960s.***
- ✓ The Turkish Constitution, Laws and Regulations and international conventions in the field of nature conservation provide the legal framework for seeking the strategy for continuity of biodiversity/genetic diversity in Turkey.



- ✓ Approximately **3400 species, 100.000 material** are kept in **2 seed gene bank** and **18 natural field gene banks**.
- ✓ About 8.000 vegetatively propagated genetic resources material, **18 research institutes are responsible for the fruit genetic resources and are kept in national field gene banks**.
- ✓ The field gene bank collections of **vegetatively propagated species consist of over 100 species**. The national collection contains the landraces, local types, wild and weedy relatives, other wild species which are especially economically important plant and endemic species.
- ✓ There are some research activities on *in vitro* storage techniques of some vegetatively propagated plant species.

Legislation

- ✓ Convention on Biological Diversity
- ✓ Law on Aquatic Products (1380-04.04.1971)
- ✓ The Forest Law (6831-31.08.1956)
- ✓ Agriculture Law (5488-18.04.2006)
- ✓ By-law on the Collection, Protection and Utilization of Plant Genetic Resources
- ✓ By-law on the Protection of Animal Genetic Resources



Naturel Field Gene Banks Collection

Species names	Total	Species name	Total
Grape	3041	Mulberry	100
Apple	767	Pistachio	94
Pear	698	Cranberry	76
Citrus	576	Chestnut	70
Pomegranate	446	Peaches / Nectarines	68
Hazelnut	440	Berries Strawberry, Raspberry, Blackberry, red currant, black currant	66
Cherry	420	Japanese medlar	62
Almond	406	Mahaleb	42
Fig	380	Avacado	35
Plum	344	Trabzon Persimmon	33
Apricot	319	Arbutus	26
Sourcherry	240	Jujube	24
Olive	221	Roseship	12
Cherry laurel	154	Carob	8
Walnut	150	Banana	3
Quince	122	Genel Toplam	9443



Turkish Registration Lists For Berries (only local varieties)

Yalova -15	STRAWBERRY	<i>Fragaria L.</i>
Yalova -104	STRAWBERRY	<i>Fragaria L.</i>
Yalova -110	STRAWBERRY	<i>Fragaria L.</i>
Festival	STRAWBERRY	<i>Fragaria L.</i>
Ebru	STRAWBERRY	<i>Fragaria L.</i>
Kaşka	STRAWBERRY	<i>Fragaria L.</i>
Sevgi	STRAWBERRY	<i>Fragaria L.</i>
Seyhun	STRAWBERRY	<i>Fragaria L.</i>
Ceyhun	STRAWBERRY	<i>Fragaria L.</i>
Eren 77	STRAWBERRY	<i>Fragaria L.</i>
Ata 77	STRAWBERRY	<i>Fragaria L.</i>
Erenoğlu 77	STRAWBERRY	<i>Fragaria L.</i>
Hilal 77	STRAWBERRY	<i>Fragaria L.</i>
Dorukhan 77	STRAWBERRY	<i>Fragaria L.</i>
Doruk 77	STRAWBERRY	<i>Fragaria L.</i>
Bolverim 77	STRAWBERRY	<i>Fragaria L.</i>
Osmanlı	STRAWBERRY	<i>Fragaria L.</i>
Ayaş	WHITE MULBERRY	<i>Morus alba L.</i>
Ulukale	WHITE MULBERRY	<i>Morus alba L.</i>
Ekşi Kara	BLACK MULBERRY	<i>Morus nigra L.</i>
Tatlı Kara	BLACK MULBERRY	<i>Morus nigra L.</i>
Potamia Güzeli	BLACK MULBERRY	<i>Morus nigra L.</i>

The berries are grown in Turkey.

Currently, in our country, raspberries, blackberries and some currants are cultivated economically mostly Sakarya, Adapazari, Bursa and around Istanbul and Giresun provinces and locations. However, other berries not cultured in the natural flora of our country constitutes a wide gene source for breeders.

- ✓ Strawberry (Fragaria), Raspberry (Rubus), Blackberry (Rubus),
- ✓ Red currant (Ribes), Gooseberry (Ribes),
- ✓ Blueberry (Vaccinium), Rosehip (Rosa), Elderberry (Sambucus)
- ✓ Gilaburu (Viburnum), Mulberry (Morus)

- ✓ **Strawberries** are the most commonly studied species among the cultivated berries in Turkey. In addition, other berries such as **blackberries, raspberries and blueberries** are cultivated commercially.
- ✓ First strawberry growing in Turkey started with local varieties «**Ereğli**» in Zonguldak, «**Arnavutköy**» in İstanbul, Karşıyaka in İzmir provinces that were selected from wild strawberries and were grown until this time for many years.



- ✓ Osmanlı local cultivar was grown in Central Anatolia in the surroundings of Ankara.
- ✓ It is the most aromatic local cultivar among the known and grown strawberries.
- ✓ The scientist Prof.Dr. Nurettin Kaşka (as known veteran of the strawberry in Turkey) established many adaptation experiments in various ecological regions
- ✓ Central Anatolia, Mediterranean coastal, Aegean, Mediterranean, Marmara and Aegean coastal regions using foreign cultivars.



- ✓ Our Ministry has mainly carried out studies on mulberry and strawberry species. We have strawberry varieties that are breeding by Atatürk Horticultural Center Research Institute in Yalova.
- ✓ In addition, (black and white) mulberry selection breeding studies are ongoing.



Images from Atatürk Horticultural Center Research Institute varieties

- ✓ In berry group, **Mulberries** are the most cultivated species after **strawberries**.
- ✓ 95% of the mulberry types and varieties cultivated in our country and benefited from its fruits are *M.alba* L. (white mulberry), 3% *M.rubra* L. (red or purple mulberry), and 2% *M.nigra* L. (black mulberry).





- ✓ Blackberry (*Rubus* spp.), Raspberry (*Rubus*), Red currant (*Ribes*), Gooseberry (*Ribes*), Blueberry (*Vaccinium*), Rosehip (*Rosa*), Elderberry (*Sambucus*) Gilaburu (*Viburnum*) are not yet widespread economically in our country.
- ✓ However, the wild forms have been recognized by the people for a long time and their fruits are collected and eaten.



Images from Yalova natural field gene bank

- ✓ In the Black Sea region, **Blueberry**, which has a wide variety of wild populations, is known by different names. In recent years, adaptation experiments on using foreign blueberry varieties have been started. In addition, due to specific soil requirement (low pH) for blueberries soilless culture become very popular especially in Mediterranean regions under protected cultivation.



Finalized TAGEM R&D program projects

- ✓ Investigation of Anticancer, Antioxidant, Antigenotoxic and Wound Healing Effects of Some Berry (*Morus nigra* L., *Morus rubra* L., *Rosa canina* L.).
- ✓ Adaptation of High Bush Blueberry varieties to Mediterranean Region.
- ✓ The Effects of Pruning and Pruning on Yield and Fruit Quality of Floricane and Primocane Varieties by Adaptation of New Blackberry Varieties.
- ✓ Determination of Adaptability of Varieties and Lines of High Efficiency and Quality Gojiberry (*Lycium barbarum* L.) in Different Ecological Conditions of Turkey.

Ongoing Projects

- ✓ Rosehip Genetic Resources at Central Black Sea Gateway Region's,
- ✓ Cornelian Cherry Genetic Resources at Central Black Sea Gateway Region's Collection, Conservation and Characterization of Mulberry (*Morus ssp.*) Genetic Resources in Southeastern Anatolia Region
- ✓ Documentation of Plant Genetic Resources
- ✓ Growing Rosehip in Erzincan and Gumushane province (*Rosa spp.*), are breeding by selection.
- ✓ Determination of Plant Characteristics of Some Black Mulberry (*Morus nigra*) Genotypes Obtained by Selection Kahramanmaraş, Osmaniye, Hatay and Adiyaman Provinces.
- ✓ Selection through Black Mulberry (*Morus nigra*) Breeding Mulberry (*Morus Spp.*) Selection-I
- ✓ Breeding of Mulberries of Erzincan and Gümüşhane Province by Selection II



FUTURE PROSPECTS

- ✓ To improve new Turkish varieties using both classical and modern breeding programmes for fresh and processing berry industry,
- ✓ Enhance marketable fruit quality and exportation,
- ✓ Combine very small production areas,
- ✓ Extending the production season in a whole year,
- ✓ Promote the farmers for annual cultivation systems,
- ✓ To create berry germplasm resources both *in vitro* and *in vivo conditions*
- ✓ *To promote hydroponic cultivation systems for all berries*





Thank you for your attention

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