

Institute of Vegetable Crops "Maritsa" in Plovdiv

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The Maritsa Vegetable Crops Research Institute (VCRI) – Plovdiv is a national research centre for scientific, applied-scientific and service activities in the field of breeding of vegetable crops and potatoes and the technologies for their cultivation. It is located in the Thracian Plain – the largest vegetable-producing region in Bulgaria.

History

In **1930**, by order of the Ministry of Agriculture and Royal Decree of Tsar Boris III, on land purchased by the state from the private farm of Milyu S. Baltov with an area of 3,634 decares, the “*State Agricultural Experimental Station*” was established with five research workers. The research work at the station was directed towards the improvement of vegetable crops, rice, forage and fibre crops, as well as irrigation. From the very foundation of the station, intensive activities were launched to study a large number of Bulgarian and foreign accessions of tomato, pepper, cabbage, onion, garden pea and common bean, etc., for the creation of new varieties of vegetable crops. More effective breeding methods began to be applied, such as continuous individual selection

in tomato, pepper and bean, individual-family selection in pumpkin and group-family selection in onion and cabbage. The following pepper varieties were created – Sivria 600, Kalinkov 800/7, Pazardzhishka Kapia 794, Kurtovska Kapia 1619; cucumber – Starozagorski langi-improved; onion – Lyaskovski 58, Plovdivski 10, Asenovgradska kaba 5; cabbage – Kyose 17; bean – Mastilen 11b, Starozagorski cher and others.

In **1932**, the use of heterosis in tomato breeding was initiated. Hristo Daskalov, together with his collaborators, started breeding of heterotic varieties in **1934**, initially creating the intervarietal combination Zarya × Komet, intended for greenhouse and early production. Owing to the successful expression of this hybrid variety and the excellent organisation of its hybrid seed production, it became widely distributed. The truly great success of heterosis in tomatoes in Bulgaria is due to the subsequent breeding work of Hristo Daskalov. He developed tomato lines by means of interspecific hybridisation (*S. racemigerum* x *S. esculentum*, variety Zarya), which are very vigorous, early maturing, with high a biological value and resistance to *Cladosporium fulvum*, but comparatively small-fruited. Such are No. 10, Plovdivska konserva, XXIVa, XXIV-2, XXIV-13, 123 and others. In F1 of these lines with large-fruited varieties of *S. esculentum* or with other lines, a very strong heterotic effect and sufficient fruit size are observed. With the participation of *S. pimpinellifolium*, lines No. 3 and No. 8 were created, which have a pronounced hybrid vigour and resistance to *Corynebacterium michiganense*. Through the combination of the two methods – interspecific hybridisation and heterosis, a heterotic effect was achieved both in terms of the quality and quantity of the fruits and in terms of resistance. One of the most valuable F1 hybrids created in this way is No. 10 × Bison, which occupied 30% of the areas for early production in Bulgaria; it was also distributed in Romania, the former Yugoslavia and the USSR. In this way, for late production, No. 10 × Rutgers and Ogosta for peeled tomatoes were created.

In **1941**, the station was transformed into the “*Agricultural Institute of Horticulture, Irrigation and Rice Growing*”, and in **1943** it received the name “*Maritsa Agricultural Experimental Institute*”. A number of eminent scientists – Academicians Pavel Popov, Hristo Daskalov, Zhechka Zhecheva and others – created more than 30 different valuable varieties of vegetables, forage crops, rice, etc. The achievements were rapidly popularised and the institute established itself as an authoritative scientific unit.

After **1949**, improvement and refinement of technologies for obtaining hybrid seeds began; the average yields per unit area also continuously increased. These successes ***placed Bulgaria in first position in the world in terms of the use of heterotic varieties in large-scale practice!***

In **1956**, the institute was transformed into a Sectoral Institute for Vegetable Crops and, together with the stations in Gorna Oryahovitsa, Negovan and Samokov, it became a complex scientific organisation for research and implementation activities on vegetables, potatoes, watermelons, melons, flowers and mushrooms.

In the following years, the institute was the unit that successfully solved the tasks of vegetable production in all its directions. Laboratory work, which is in inseparable connection with the breeding activity, was developed. Laboratories on physiology and agrochemistry of vegetable crops were established. A large number of varieties of pea, tomato, pepper and bean suitable for mechanical harvesting were bred; new industrial technologies for their mechanised cultivation and

harvesting were developed. Special attention was paid to breeding and improvement work in tomato. The search for and study of new gene donors of resistance began, and methods for testing and evaluation of breeding material for resistance to various diseases were developed.

These gene donors are still used today in breeding practice in Bulgaria and abroad!

Today, VCRI “Maritsa” has 1,900 decares of arable land, over 17.5 decares of glasshouse structures with steel frames and 2.5 decares of greenhouses with plastic covering. The main share in the scientific research is breeding, variety maintenance and seed production of vegetable crops.

An important stage in the development of the institute is its participation in projects funded by the Science Research Fund at the Ministry of Education and Science, as well as projects financed under the European Framework Programmes – FP 6, FP 7 and Horizon 2020. With the help of these funds, a modern laboratory infrastructure has been built, the vegetation facilities and phytotron chambers have been modernised, and chambers for short-term storage of seeds at 4 °C have been constructed. A significant number of scientists have specialised in leading European universities and institutes. Within the structure of VCRI, thanks to a successful project under the PHARE programme, a Technology Transfer Centre has been established, an important unit in view of the practical orientation of the research programme of VCRI “Maritsa”.

Structure

Department “Breeding, Variety Maintenance and Introduction”

Head: Associate Professor, PhD Stanislava Grozev

The department includes groups for breeding of tomato, pepper, cucumber, cabbage, garden pea and common bean, onion, garlic and potatoes, as well as laboratories for: quality; tissue cultures; physiology; immunity to viral diseases; cytology and molecular biology.

Department “Technologies in Vegetable Production”

Head: Associate Professor, PhD Hriska Boteva

The department includes groups for agrotechnics of field and greenhouse vegetable production, as well as laboratories of agrochemistry, phytopathology and entomology.

Production-Experimental Base (PEB)

Production of pre-basic, basic, certified and standard seeds of varieties and hybrids of vegetable crops, intellectual property of VCRI “Maritsa”; cultivation of crops in crop rotation and seed production of field crops; efficient use of glasshouse structures with steel frames throughout the year; seed production and utilisation of by-products.

Technology Transfer Centre (TTC)

Established in 2007 with the financial support of the Ministry of Economy and Energy of the Republic of Bulgaria under the PHARE programme, the TTC provides the link between science and practice. It contributes to the commercialisation of the scientific products of VCRI “Maritsa” and ensures feedback to the scientists.

Read the full text in issue 1/2017 of the journal “Plant Protection”, which is on the market as of today.