FINANCING/SELF-FINANCING OF THE VEGETABLE RESEARCHES AT THE INSTITUTE FOR VEGETABLE CROPS, SMEDEREVSKA PALANKA
• The Institute for Vegetable Crops, today the leading institution in vegetable seed production, was founded in 1946.

• Back in those days it was an experimental field, a part of the Topčider Agricultural Station.

• Due to the successful breeding programmes, in 1954 it became the Office for Breeding and Producing Vegetable Seed. Since 1991 till 2006 this is a Centre for Vegetable Crops, a part of the Agricultural Research Institute „SRBIJA“, Belgrade.

• Since November 1st 2006 the Centre becomes the Institute for Vegetable Crops, Ltd.
Since its foundation till today, the Institute is a state institution, a department of the Ministry of Education and Science of the Republic of Serbia.

At the moment the Institute has 69 permanent employees. Scientific research is conducted by:

- 9 researches with PhD degree,
- 6 research associates,
- supporting technical stuff and necessary manual workers.

Sometimes, during the season, the number of engaged labours is up to 40.
The research work is the primary work at the Institute and is organized through departments of genetics and breeding, phytopatology, agrotechnique and seed production and accredited Laboratory for seed quality control.

The results of the research at the Institute are about 165 created hybrids and varieties pepper – 34, tomato – 26, pea – 20, cucumber – 20, snap bean – 13 And many other... from which about 90 are being produced in our country and abroad.
• New selected varieties have been included in the variety lists in:

• Macedonia (11 varieties),
• Belarus (21),
• Bulgaria – European list (5).

• Process for including of Institute’s varieties in variety lists in Ukraine, Turkey and some countries of Asia and Africa is underway.
As the seed is cleaned and packed at the Institute, this institution holds itself responsible for seed quality and the implementation of the laws and standard ISO 9001-2001 regarding the quality management.
• Tradition, experience, knowledge and constant improvement of the scientific team is complemented by the adequate working conditions;

• 150ha of arable land;
• about 7000m² under glass and plastic houses for protected production during the off spring;

• the laboratories for:
• tissue culture,
• phytopatology,
• chemical research and genetics,
• seed quality control
• and the Gene bank.
DEPARTMENT OF GENETICS AND BREEDING

- The application of the appropriate methods,
- selection of the favourable lines and
- new methods

Guarantee genetic biodiversity, collection and preservation of wild and semi-wild species.

This department has
- 12 researchers and
- 10 laboratory technicians
PLANT PROTECTION DEPARTMENT

Phytopatology, etymology and herbology researches go toward the usage of genetic potential of varieties and hybrids created at the Institute.

The usage of these technologies in creating genotypes resistant to diseases, tolerant to pests and herbicides is in accordance with the principles of the environmental friendly policy and represents the imperative at this department.

This attitude is especially important for organic vegetable production, which started only recently at the Institute.

The conventional plant protection is applied through all growing phases together with analysis of soil and plant material, ending with seed health protection.
AGROTECHNIQUE AND PHYSIOLOGY DEPARTMENT

This department deals with:
- the new growing technologies;
- the optimal sawing time;
- planting;
- the size and the shape of the vegetation space;
- fertilization;
- watering;
- prompt weed, diseases and pest protection,
  as well as many other technological processes interesting for specialized way of growing vegetable plants.

Chemical laboratory analyses traits of the new lines.

Stuff in this Laboratory is going through a process of specialization, at the moment, for organic (bio) production of vegetables, seed.
SEED PRODUCTION DEPARTMENT AND
THE LABORATORY FOR SEED QUALITY CONTROL

Vegetable seed and crop production is carried out on 152ha. Crop cultures have been introduced due to crop rotation and adequate usage of herbicides. It is well known that usage of allowed herbicides (at the positive list) does not control all weeds. By including corn and wheat, the list of herbicides is expended and the efficiency improved.
The Institute produces pre-basic and basic seed of those cultures (tomato hybrids, cucumber, sweet corn, watermelon) where some problems may occur regarding varietal purity.

The irrigation system covers 120 ha.
The pea occupies the greatest area in the Institute vegetable production, with 30-40ha.

Besides pea, other vegetable of high category: snap bean, bean, tomato, cucumber, watermelon, melon, lettuce, carrot, root is also grown.
The Institute produces seed in cooperation with private producers all over Serbia.

Seed production is organized in this way due to several reasons:

• lack of arable area to implement the special isolation,

• lack of manual workers of all categories,

• lack of green houses for vegetable production,

• unfavourable weather conditions for some cultures.
The Institute has special machines for seed extraction and machines for seed cleaning and fine cleaning. The seed is packed in hobby and professional machines.
NEW TECHNOLOGIES

Introduction of the new technologies includes:

• The usage of natural products in fertilization of vegetable crops;

• Testing the impact of soil quality and water on health and nutrition value of vegetables;

• New technological solutions in saving energy in vegetable production.
FINANSING OF THE INSTITUTE

During the first years of its existence (during socialism) the Institute was totally financed by the State.

Vegetable production is specific since it needs a lot of manual work and, in those early years not so much mechanisation was available.

This caused a big number of employees.
The first problems occurred in 1964/65 when Law on economic accounting was adopted and implemented.

This Law caused a real confusion in the Institute management.
Earlier in 60s, the project of founding the

- **Laboratory for quality of vegetable for proceeding industry**
  turned into a project of founding the

- **Factory for proceeding vegetable and fruit**, which meant more employees.

- By applying the Law, employees at the Factory could not be payed from the state funding.
At the same time, scientific part of the Institute, burdened with loans, started to stumble. The Institute was insolvent. This agony lasted for a couple of years.

Financial losses have reached the half of a total value of all buildings belonging to the Institute.
The problem was solved by dividing the Institute in several parts and selling
the Factory for vegetable and food proceeding to “Voćar”, Belgrade,
selling the glass house in Ulcinj to Agricultural combine “13 Juli”, and
5ha of land was sold to Organization for Utility services in Palanka.
In this way the number of employees was decreased significantly – in half. The Institute enlarges the seed production for pre-arranged buyer, decreasing the seed stocks in this way and selling by economic prices. Besides the fact that the buyer was pre-arranged, some of them agreed to pay in advance.
On the other hand, the Maize Research Institute, Zemun Polje organized production of maize hybrid seed at the Institute field and paid for this service in advance.

Almost at the same time food proceeding industry grows and needs more vegetable as a row material which caused increased selling of vegetable seed.

This enabled new cycle of vegetable breeding.
The Republic fund for Science partially financed the Project of researching vegetable as a raw material for industry and for researching the seed production, participating in this way with 20% of total finance of the Institute.

This is the highest percentage of State financial involvement at the Institute, ever.
The Institute employed new, young researchers.

Licence of the Bulgarian tomato hybrid No10xBizon has been bought.

Institute participated in the Projects regarding vegetable fresh consumption and proceeding.

At that time, new laws prohibit the usage of non declared seed, which was favourable for the Institute.
Management of the Institute had a big and true advantage at the time – they were a part of the government in Former Yugoslavia and their expert opinion was accepted.

In the years to come, the export of the seed grows. Also, the Institute starts to produce the seed in cooperation with private producers since its own arable area was insufficient.

New researchers were able to improve their knowledge in: France, Holland, Germany, USA which resulted in appliance of the new – world technologies in vegetable breeding.
Looking back to those days, it is more than clear that the science was the most important part of the Institute work, in order to improve the quality, taste, disease resistance, protection against biotic and abiotic stresses.

New selected lines were maximally adjusted to our climate and our production conditions while the research programmes were structured so they could be applied in praxis.
• Successful breeding programme stimulated the development of other segments – seed production the most.

• At that time, seed was cleaned only primary at the Institute and sold to the buyers in bulk.

• Buyers than packed the seed in small bags and distributed it at the market.

• Marketing policy has been led partially by the Institute and partially by big buyers.
This course changed during the crises in 90s, when the Institute began to pack the seed and started its own commercial service.

At first, the seed was distributed directly to agricultural shops, which were not numerous at the time.

Today, there are a few distribution firms and lots of shops.

The advantage of this situation is the constant contact of the shop owners with the Institute in order to be informed.

The Institute took the responsibility of increased marketing through media: television, radio, papers, courses, fairs in Serbia and abroad.
Seed production in cooperation requires visits by our experts at least twice during each critical phase of growth.

Quantities and scope of seed production in cooperation depend upon the market.

Today, Institute produces 65-70% of vegetable seed in Serbia.
ORGANIC SEED PRODUCTION

One of the further directions of Institute’s development is the organic seed production.

This concept is new, so the next steps toward this aim are:

• the study of the feasibility;
• starting the procedure of certification of some Institute’s fields
• and finding the appropriate producers for this sort of production.
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<thead>
<tr>
<th></th>
<th>CLEANED (Kg)</th>
<th>GERMINATION (%)</th>
<th>CLEANED (Kg)</th>
<th>GERMINATION (%)</th>
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<tr>
<td>1. PEPPER</td>
<td>5959,82</td>
<td>80,78</td>
<td>4973,5</td>
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<td>2. TOMATO</td>
<td>67,67</td>
<td>85</td>
<td>251,16</td>
<td>81,07</td>
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<td>3. CUCUMBER</td>
<td>256,7</td>
<td>90,3</td>
<td>1331</td>
<td>92,2</td>
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<td>4. Cucurbitaceae</td>
<td>735,5</td>
<td>59,25</td>
<td>3366</td>
<td>72,75</td>
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<td>5. ARCHES</td>
<td>42,5</td>
<td>68</td>
<td>258</td>
<td>80,75</td>
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<td>6. ROOT MANGEL</td>
<td>699,3</td>
<td>81</td>
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<td>85,5</td>
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<td>7. RADISH</td>
<td>46</td>
<td>85</td>
<td>854</td>
<td>88</td>
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<td>8. MELON, WATERMELON</td>
<td>281,5</td>
<td>93,3</td>
<td>280</td>
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<td>9. ROOT CROPS</td>
<td>653,5</td>
<td>74,85</td>
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<td>10. LETTUCE</td>
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<td>11. ZUCHINNI</td>
<td>168</td>
<td>97</td>
<td>841</td>
<td>93,66</td>
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<td>12. BEAN</td>
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<td>13. PEA</td>
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Review of the quantity and quality of the seed produced in 2010 and 2011.
Besides the research programmes and seed production, the incomes are achieved through realisation of the projects financed by the ministeries of the Republic of Serbia or foreign governments. At the moment, the Institute participates within the following projects:

1) III 46007 „New autochthonous isolates of bacteria Lysobacter and Pseudomonas as an important source of metabolites useful in biotechnology for stimulation of growth of plants and control.......“.
2) III 46008 „Development of integrated systems of managing harmful organisms in plant production in order to overcome the resistance and improve the quality....“.
3) TR 31005 „Contemporary bio-technological approach in resolving the problem of drought in the agriculture of Serbia“.
4) TR 31059 „The new concept of breeding vegetable varieties and hybrids for sustainable growing by applying biotechnological methods“.
5) 401-001958/2020-03 “The project of reforming the agriculture of Serbia in transition, The Star Project, „The production of organic certified vegetable seed by applying the adequate technologies of organic seed production“.
6) SEE-ERA.NET Plus Joint Call Ref.ERA 226/01
„Exploration of Balkan biodiversity of Capsicum spp.
To extract biotic stress resistant germplasm“
All these projects participate in the Institute’s funding
about 8%.
The existence and the work of the Institute is being presented at many conferences, through scientific papers, in daily, periodical, popular and/or scientific journals, TV, books, brochures, fairs, vegetable and other meetings of vegetable producers (Watermelon days in Osipaonica, Pepper days in Ruski Krstur, Banatski Brestovac, Rutevac, Bean days in Ravni Toplovac, Cabbage days in Glogonja etc.).
THANK YOU!