



# THE IMPACT OF THE RESEARCH RESULTS ON THE ROMANIAN AGRICULTURE

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# ROMANIAN RDI SYSTEM IN THE FIELDS OF AGRICULTURE AND FORESTRY



*Institutional organization*

## ACADEMY OF AGRICULTURAL AND FORESTRY SCIENCES (AAFS)

*The National Forum for:*

Recognition of the prominent  
Romanian scientists as  
members of AAFS.

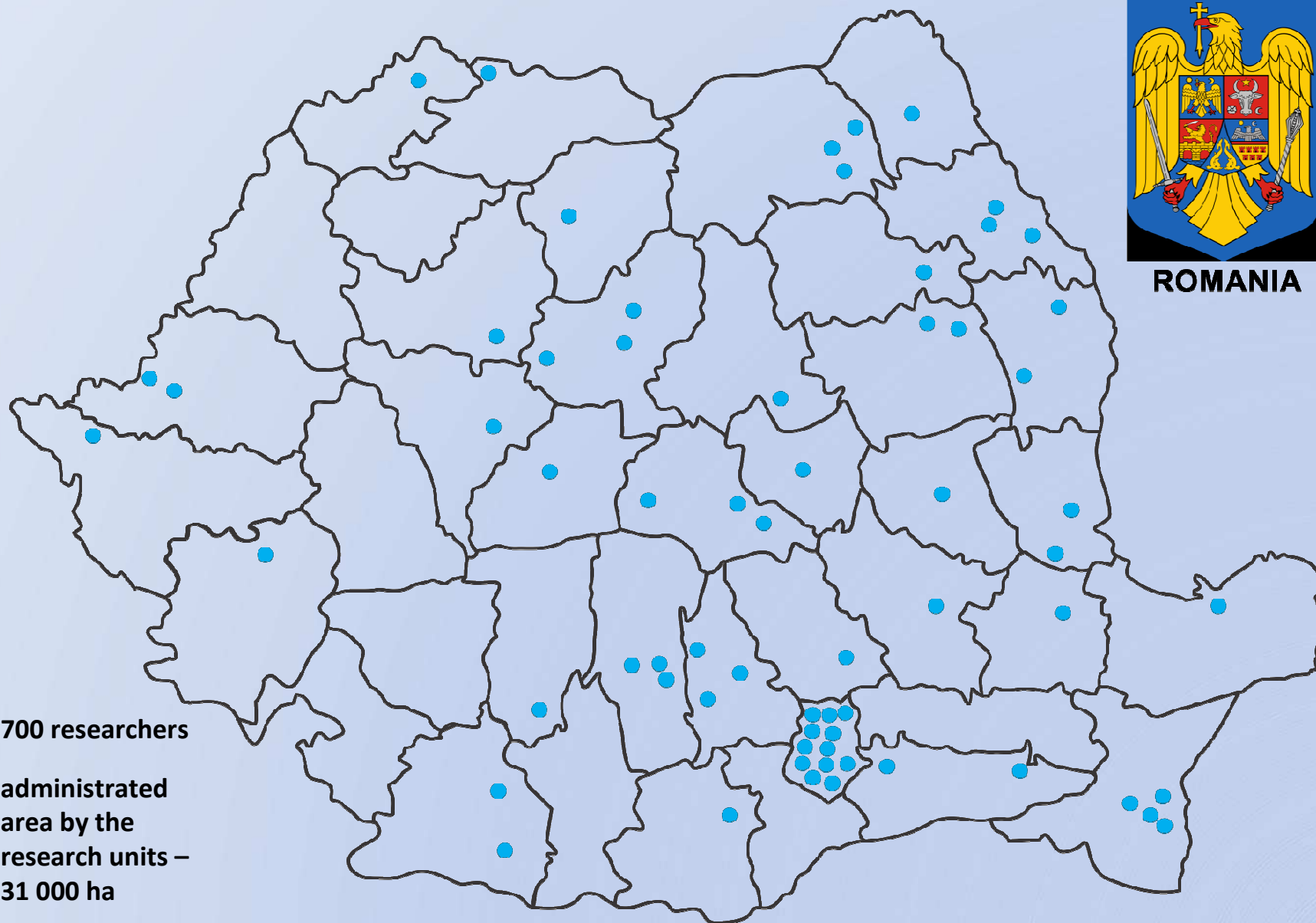
Coordination of the  
agricultural and forestry RDI  
activity in:

- 18 RDI Institutes
- 40 RDI Station

# DISTRIBUTION OF THE RESEARCH UNITS THROUGHOUT THE COUNTRY



**ROMANIA**



- 700 researchers
- administrated area by the research units – 31 000 ha



## ***Research activities:***

- ***Creation of new cultivars***, better adapted to the diversity of soil and climatic conditions, with more resistance to low and high temperatures and to the diseases and pests attack, more productive and with better quality;
- ***Elaboration of crop technologies***, making evident the real biological potential of cultivars, more profitable (cheaper) and environmentally friendly;
- ***Seed production from newly created varieties***;
- ***Extension*** – transfer of research results into farmers' practice;



## IMPACT OF THE RESEARCH RESULTS

- ***Dissemination of new cultivars to farmers***
  - Annually, a quantity of  $> 50\ 000$  t of seeds is delivered to farmers for seed multiplication and for extending the new cultivars on larger areas; 30% of arable land is cultivated with Romanian cultivars;
  - Organizing the demonstrative fields with new cultivars in comparison with current cultivated ones;
  - Meetings with the farmers. Debates and discussions on the behavior of new cultivars regarding yield level, diseases and pests control, yield quality, marketing,...
  - Dissemination of booklets, leaflets, with description of new cultivars and recommendations on their cultivation;



# ***Dissemination and implementation of improved crop technologies***

- **Setting up the demonstrative fields regarding:**
  - **Fertilization (different rates, microelements, application during vegetation, ...)**
  - **Different methods of soil tillage (minimum and conservation tillage);**
  - **Weed control, pests and diseases control (different herbicides → rates, time of application);**
  - **Exhibitions with agricultural equipment;**
- ***Mass-media*** – **publications, interviews with recommendations by radio and TV;**
- ***Individual consulting.***

# □ NATIONAL AGRICULTURAL R-D INSTITUTE - FUNDULEA (NARDI)

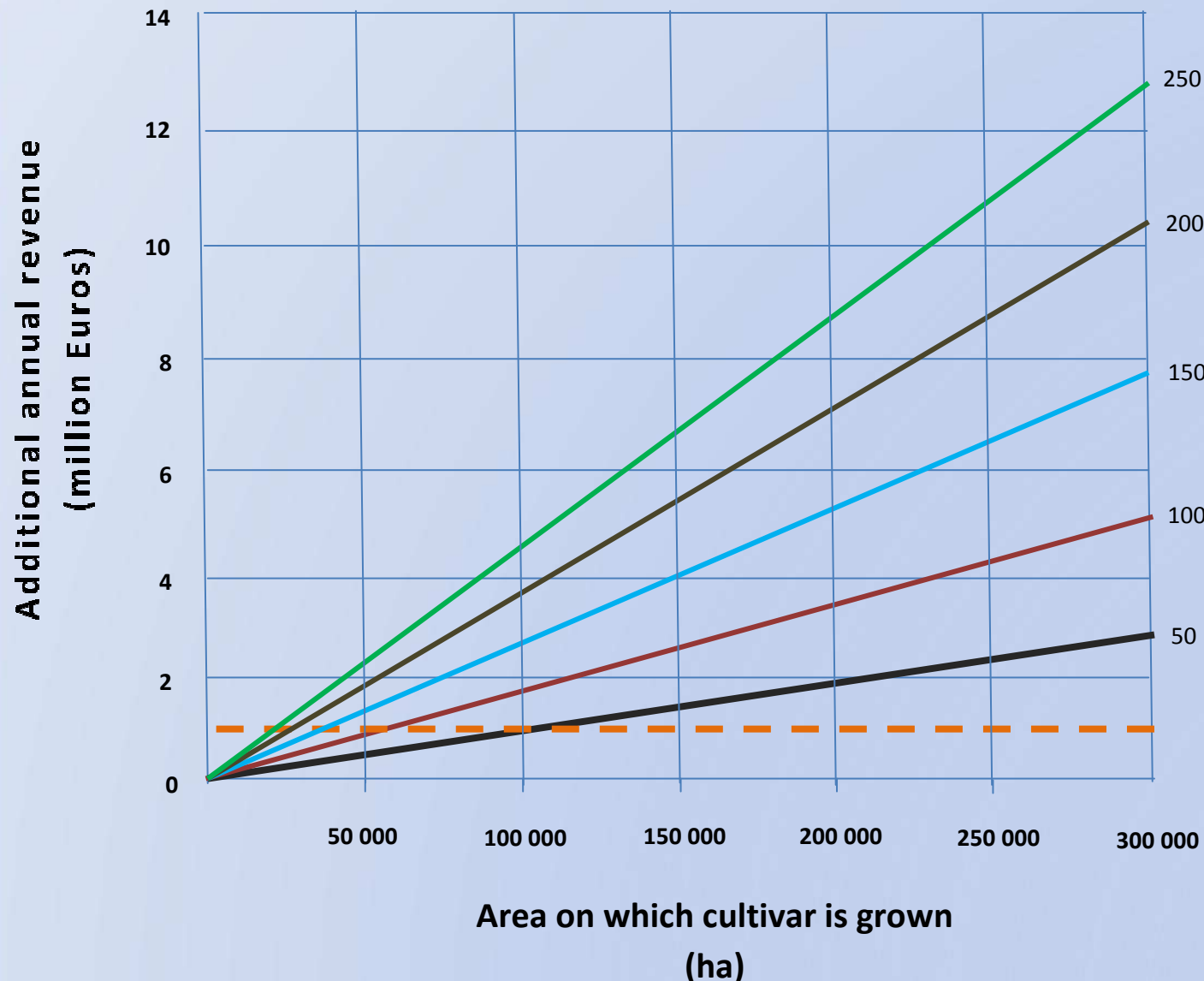


- **Extending the cultivated area with new cultivars, created by NARDI**
  - **Delivering a quantity of 3100 t seeds to farmers;**
  - **66% of wheat area is cultivated with NARDI varieties (1 300 000 ha);**
  - **Registered created cultivars: 137;**
- **Promoting the new crop technologies for soil tillage and plant protection, with reduced expenses;**
- **Promoting the ecological agriculture.**

# ESTIMATION OF THE ECONOMIC IMPACT OF WHEAT BREEDING (NARDI - Fundulea)



Yield increase  
(kg/ha)



**Example:**

Wheat cv. GLOSA

-Average yield increase

>200 kg/ha;

-Area cultivated in 2010

>300 000 ha;

-Additional production >  
60 000 t;

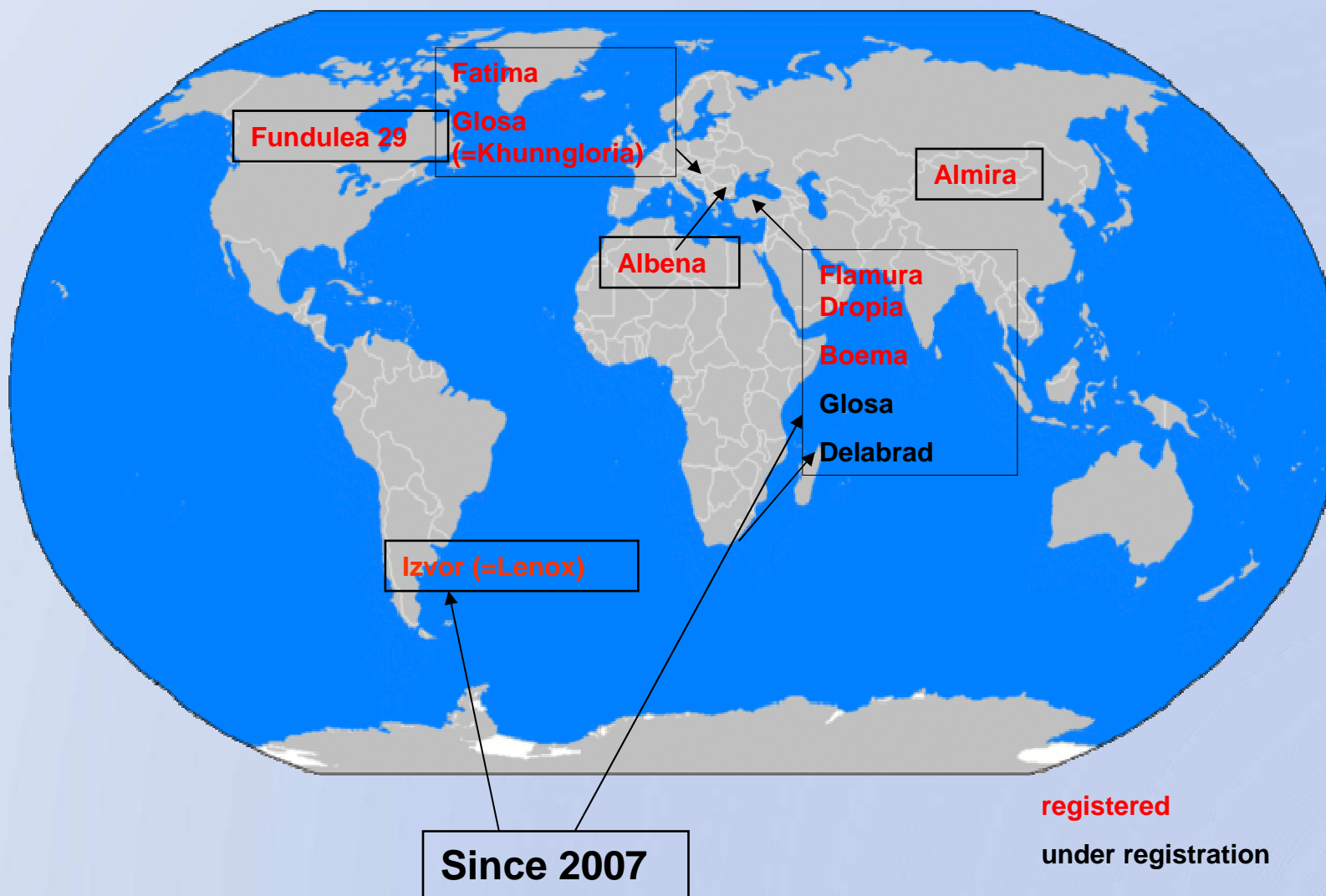
-~ 10 million euros;

Annual expenses of the  
breeding program





# NARDI contribution to wheat production worldwide





# NARDI and joint sunflower hybrids in the world



# WINTER WHEAT BREEDING FIELD

(NARDI-Fundulea)



*Colloque Européen des Académies d'Agriculture on "Science in agriculture: historical perspectives and prospective insights",  
AAF, Paris, 12 October 2016*



# Barley breeding field (NARDI-Fundulea)

Colloque Européen des Académies d'Agriculture on "Science in agriculture: historical perspectives and prospective insights", AAF, Paris, 12 October 2016



**Aspects from the sunflower breeding field (NARDI-Fundulea)**



## Maize sown after wheat on a non-tilled soil



NARDI - Fundulea



## Soybean sown after maize on a non-tilled soil



NARDI - Fundulea



## □ AGRICULTURAL R-D STATION – TURDA

- The new created cereal varieties are cultivated on an area of 1 million hectares;
- The yield increases due to new cultivars has a value of 20-25 million euros.
- Maize hybrids F1/F2 → yield difference > 500-600 kg/ha → 15-20 million Euros.

**Annual expenses for research → 300 000 euros**

## □ AGRICULTURAL R-D STATION – TELEORMAN

- Influenced area = 260 000 ha
- New cultivars of peas, chick, castor, cotton;
- Delivering the seeds + Technical consultancy → the farmers' income increased by 20-25% → 10-15 million euros;

**Annual expenses for research → 340 000 euros**



# IMPACT OF THE RESEARCH RESULTS



- The farmers got a lot of new knowledge regarding the crop management. They have become more capable to make good decisions, more conscious of the importance of the research activity, which can bring them an obvious benefit;
- Extending the cultivated area with new cultivars, created by research institutes (stations).
- Extending new and improved cropping technologies
  - plant protection (testing the new pesticides (rates, time of application ...));
  - soil tillage → conservation agriculture → reduction of expenditures (15-20%) and soil protection;
  - Soil protection against erosion using methods elaborated by research;



Source: Prof. I. Ionita

Colloque Européen des Académies d'Agriculture on "Science in agriculture: historical perspectives and prospective insights",  
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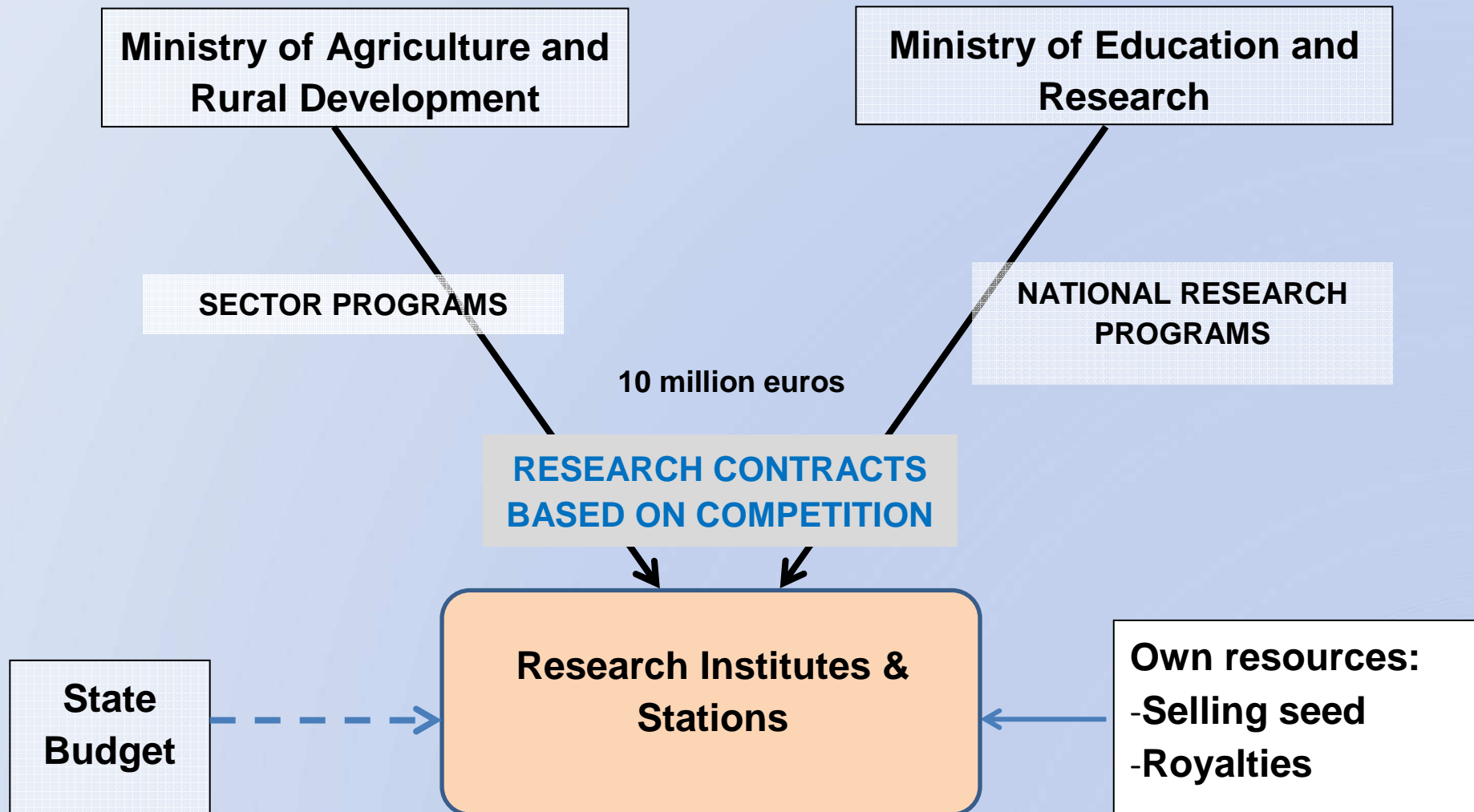


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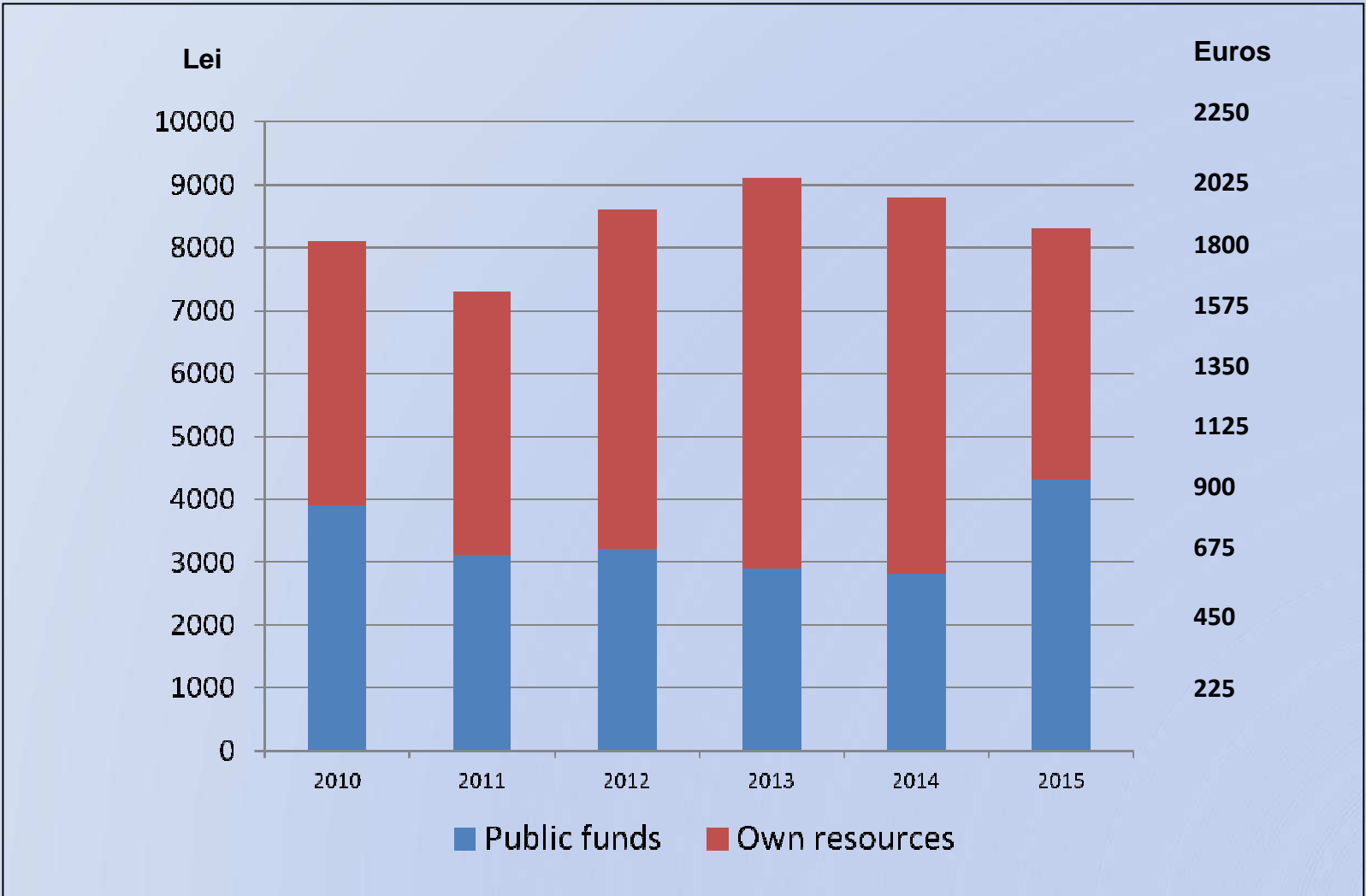
# FINANCING OF RESEARCH





# Contribution of available financing sources during 2010-2015 (thousands lei / euros)

## National Agricultural R-D Institute - Fundulea





# HORTICULTURE

(fruit growing, viticulture, vegetable growing)

## ***Research activities:***

- **Creating the new varieties, more tolerant to diseases, higher quality (taste), more productive, ...**
- **Elaboration of cropping technologies (seeding, diseases and pests control, weed control, irrigation, fertilization, harvesting; reduction of treatments;**
- **Producing the seed and planting material from new varieties;**
- **Acclimatization and breeding of new species from distant areas.**
- **Extension - transfer of research results to farmers;**



- **Dissemination of horticultural research results**

- Annually, more than 600 000 trees from nursery of fruit trees and vine and > 2 mil. seedlings + 600 kg seeds of vegetable are delivered to farmers;
- Organizing the demonstrative fields with new cultivars, new cropping technologies, new methods of planting, methods for plant protection;
- Meetings with the farmers for discussing the problems which they are confronted with, desires, unfillings, difficulties,...
- Dissemination of booklets, leaflets with practical recommendations;
- Individual consulting;

# □ R-D INSTITUTE FOR FRUIT GROWING-PITESTI-MARACINENI



***“Technical and economic guide for pomiculture”***, with a description of 26 species, with practical recommendations for succeeding the setting up an orchard (choosing the species and varieties depending on ecological zones and microzones, data regarding the crop management). It is destined to all who are interested in pomiculture.





## □ R-D STATION FOR FRUIT GROWING – CONSTANȚA



- National Collection for apricot and peach trees (**1150 accessions**);
- Creation and registering 15 varieties of apricot and 31 cultivars of peach;
- Annually, a number of 36 000 of apricot and peach trees from nursery are delivered to farmers;
- Organizing **> 70** demonstration fields, training and meetings with the farmers;
- Studies and drawing up projects for setting up new orchards (1.5-50 ha) in six counties;
- Cooperation with different institutions and companies from France, Italy, China, Hungary, Bulgaria, Turkey;



## **□ R-D STATION FOR VITICULTURE AND OENOLOGY – BLAJ**

- Collection of germplasm (72 varieties and clones);**
- Delivering the planting material (2 mil. of vine shoots for grafting, 1 mil. rootstock cuttings), resistant to diseases and to low temperature;**
- Demonstrative fields, training courses, dissemination of research results, publications ...**



## **□ R-D STATION FOR VITICULTURE AND OENOLOGY - MURFATLAR**

- **Creation of new varieties, elaboration of new technologies for obtaining different types of wine;**
- **Demonstrative fields in ecological system (15 ha);**
- **Testing for registering > 75 products for plant protection;**
- **Practical technological recommendations for 7000 ha area of influence;**
- **Analyses regarding the viability and fertility of buds**
  - ▶ **necessary for planning the future grapes production (~ 6500/27 com.soc.);**



## □ R-D STATION FOR VEGETABLES – BUZAU

- Creation of new cultivars (57);
- Germplasm conservation – **2500 accessions;**
- Producing and delivering the seeds of new varieties to the farmers (~ 15% from market demand);
- Testing ecological fertilizers;
- Acclimatization of new species of vegetables and promoting them to farmers (consumers);
- Demonstrative fields, consulting, publications.

# ANIMAL HUSBANDRY



## ***Research activities:***

- ***Increasing the genetic potential for production and its quality, in sheep, goats and bovines, by crossing with other more productive breeds, creating new breeds;***
- ***Elaboration and application of new biotechnologies for reproduction ;***
- ***Increasing the efficiency of feeding → higher conversion degree of fodders;***
- ***Improving the technologies for growing the animals;***
- ***Creating the specialized lines in milk and in meat, according to the market demands;***
- ***Extension – meetings with the farmers, trainings, delivering the animals for reproduction, exhibitions, publications;***

## IMPACT OF THE RESEARCH RESULTS



### □ R-D INSTITUTE FOR SHEEP AND GOATS - PALAS, CONSTANTA

- **A sheep breed specialized for milk was created, with a higher production > 70-100% more than from autochthonous breeds.** Annually, a number of 70 rams are delivered to farmers. By crossing with local breeds, milk production increases by 50%.
- **A new breed specialized for meat, with higher traits is now used for crossing with local breeds. Annually, it is delivered to farmers > 100 rams.**

**Similar results were achieved at goats.**



## □ RESEARCH STATION FOR GROWING SHEEP FOR FUR – POPAUTI

- Breeding the Karakul breed with a fur of different colours: black, greyish (7 hues) brown, pink (5 hues), white (3 hues);

## □ NATIONAL R-D INSTITUTE FOR BIOLOGY AND ANIMAL NUTRITION - BALOTESTI

- Delivering > 80 fodder products to farmers (including ecological fodders), as result of research.



# □ RESEARCH STATION FOR FISHERY – NUCET

## □ RESEARCH INSTITUTE FOR AQUATIC ECOLOGY AND AQUACULTURE - GALATI

- **Elaboration of technologies for:**
  - artificial reproduction
  - intensive growing system
- **Acclimatization of new species, artificial reproduction**
  - *Polyodon spathula (paddlefish)*  
(70 kg – rapid growing, feeding with plankton).
- **Creation of a collection of species and breeds (genotech);**
- **Improving the equipment used in fishery management;**
- **Methods for evaluating and prognosis of fish resources;**
- **Transfer of research results:**
  - **Dissemination of biological material for populating the fish farms (500 000-embryonic spawn, 100 000 – young fish of 30 days, 5000 – fish of 1-2 years):**
    - farmers' visit at the station for getting biological material and new knowledge about artificial reproduction and growing technologies;
  - **Transfer of technologies for artificial reproduction and intensive growing (~ 700 farms);**





## *Polyodon spathula*



*Res. St. for Fishery - Nucet*

## □ RESEARCH INSTITUTE FOR FOOD BIORESOURCES



- **Detection and quantification of mycotoxins in cereal grains;**
- **Contamination with fungi and mycotoxins on the flux milling – panification;**
- **Creation of non-glutenic products for persons with intolerance to gluten;**
- **Products for diabetic persons;**
- **Hypoglucidic and hypocaloric products;**
- **Elaboration of methods for controlling the quality of food products**
  - **mycotoxins**
  - **specific proteins in GMO**

# PROPOSALS



- ***Restructuring (reorganizing) the network of research units***
  - Abolishing the stations which do not have a research potential (lack of research personnel, old technical endowment, debts);
    - Joining (unifying) the near units or with the same profile;
    - Concentration the research activity in the units (institutes, stations) with a real research potential;
  
- ***Improvement of research programs – new research objectives***
  - Reducing the effects of climatic changes;
    - Increasing the crop resistance/ tolerance to extreme climatic phenomena (long lasting drought, very high and very low temperatures);



- ***Continuing the approached research objectives as:***
  - **Increasing the production and its quality, according to market and consumers' requirements;**
    - **Control of pathogens, pests and weeds;**
    - **Improvement of soil fertility, preventing the deterioration of soil features (acidification, salinization, pollution, compaction, decrease of organic matter);**
    - **Maintaining the biodiversity;**
    - **Avoiding / reducing the environment pollution;**



**THANK YOU FOR YOUR  
ATTENTION!**