DEPARTMENT OF TECHNOLOGY

FOR POTATO, SUGAR BEET, CEREALS AND MEDICINAL PLANTS

- integrated and differentiated technologies for potato, sugar beet, medicinal plants and cereal, with low energetic expenditure, un-polluting and economic, for actual climatic changes;

- physiological bases of yield formation, potato and sugar beet modelling and simulation;

- prognosis methods, alert and control of main potato, sugar beet and medicinal plants pests and diseases, testing and homologation of phyto-sanitary products;

- zoning, micro-zoning, management and marketing of potato, sugar beet, medicinal plants through informational technology;

- testing culinary and technological qualities, storage behaviour for characterisation of NIRDPSB Brasov new varieties and lines;

- promotion and conserving native medicinal plants for reestablishment and restoration of soils, flora and auxiliary fauna.

- promotion ecological technologies for potato, sugar beet and medicinal plants, on the new UE orientation and market demands.

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Human resources dynamics

Department of Technology 2007-2011

Scientific degree	2007	2008	2009	2010	2011
SR I	3	3	3	2	2
SR II	1	1	1	1	1
SR III	3	3	3	3	3
SR	-	-	1	1	1
ASR	1	1	-	1	3
Auxiliary perssonnel	9	9	8	8	8
Total	17	17	16	16	17

SR - scientific researcher, ASR - assistant scientific researcher

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Infrastructure and endowments:

- laboratories (technological and culinary quality, bacteriosis, mycosis, entomology, dormancy and storage, pesticide testing with GEP accreditation);
- storages for research, with thermal isolation spaces to establish vegetative dormancy, storage and factors capacity;
- work spaces (studies) for researchers;
- agricultural land for experimental field;
- agricultural set of machinery for land preparation, planting, sowing, maintenance, chemical and ecological application:
  - tractors (NEW HOLLAND 94 CP tractor, NEW HOLLAND 140 CP tractor)
  - potato sorting equipments (GRIMME sorting device)
  - seed conditioning installations (Bjilsma machine)
  - GRIMME planting machine
  - GRIMME application machine
  - GRIMME harvesting machine
- laboratory apparatus for various works:
- devices for potato processing in order to determine technological and culinary qualities (boiling vessel, oil frying, Soxlet device for fat extraction, analytical balances, starch balances);
- microscopes and stereo-microscopes, accessories, laboratory vessel;
- drying stove, drying stove thermo-states;
- sorting and processing installations for sugar beet in order to determine sugar content;
- polarymeter, pH-metre, spectrophotometer.

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Projects:

Research projects:

Nr.	Programm	Contracting authority	Nr. contract / year	Finalized year	The institution status on project
1	PS 221	MADR Bucureşti	340/2006	2010	Coordinator
2	PS 614	MADR Bucureşti	341/2006	2010	Coordinator
3	SCG	MADR Bucureşti	141559 /2008	2011	Coordinator
4	POS CE	ANCS	2010	2011	Coordinator
5	PS 631	ICDP Braşov	339 /2006	2010	Partner
6	PS 212	INCDA Fundulea	325 /2006	2010	Partner
7	PS 222	INCDA Fundulea	330 /2006	2010	Partner
8	PS 211	INCDA Fundulea	322 /2006	2010	Partner
9	PS 241	ICDPP Bucureşti	353 /2006	2010	Partner
10	PS 512	SCDC Tg. Secuiesc	328 /2006	2010	Partner
11	TADES 51010	ICDPP Bucureşti	51010 /2007	2011	Partner
12	Biotech 51097	CCDCPN Dăbuleni	51097 /2007	2010	Partner
13	STRADA	ICDP Braşov	51095 /2007	2010	Partner
14	Biogef	INCDO Cluj Napoca	22099/2008	2011	Partner

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Publications and patents:

	2007	2008	2009	2010	2011
Papers ISI	-	-	-	-	-
Scientific papers	6	11	5	10	5
Popularisation papers	5	3	8	9	7
Books/book chapter	-	1	-	-	-

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Dissemination of scientific results:

- scientific publications
- participation to national and international symposia
- "Green Day" of potato with *in-put* intern and international firms and farmers
- annually demo fields
- exhibitions organized abroad and in the country
- by media
- scientific and technical support for MADR strategies
- scientific and technical support for students, masters, doctoral students

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Department structure and objectives:

POTATO	SUGAR BEET	CEREALS	MEDICINAL PLANTS
1. Identification of integrated technological solutions on durable agriculture context. 2. Monitoring, prognosis and forecasting of potato weeds, pests and diseases control. 3. Selecting agro-technological methods and chemical means with minimum impact on environment for potato pests and diseases control. 4. Testing ond homologation of new fertilizing resources to reached a well-balanced NPK and micro-elements nutritions 5. Development of researches concerning potato ecological crop. 6.Tests on culinary and technological qualities, storage behaviour for NIRDPSB Brasov new varieties and lines characterization. 7. Efficiet yield turning into accout through potato products diversiffication. 8. Development of researchers concerning precision farming and potato vegetable status monitor.	1. Identification of regional technological solutions for sugar beet crop on durable agriculture context. 2. Experimenting and homologation of new fertilizing resources to reached a well-balanced NPK and micro-elements nutrition. 3. Selecting agro-technological methods and chemical means with minimum impact on environment for sugar beet pests and diseases control. 4. Elaboration of technological sequences to produce biomass energetically turning into account.	1. Identification of cereal genotypes with resistance to termo-hydric stress, wintering, pests and nitrogen deficit. 2. Elaboration of innovative technological elements, adapted for climatic change. 3. Producing seeds with high biological characteristics from hybrids, varieties and new lines demanded on market -autumn wheat - triticale - two-row barley	1. Maintaining existing genetic funds of medicinal plants; 2. Producing breeding material (vegetative and germinative) to extend medicinal and aromatic plants crops. 3. Finding technical solutions to assure profitableness of medicinal and aromatic plants crops. 4. Medicinal plants promotion as solutions for soils, favourable flora and fauna reestablishment and rehabilitation.

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Potato - Specific objectives:

- Finding out favorable crop rotations to turn to account their advantages for yield and environment protection.
- Elaboration of modern, integrated and differentiated technologies, on climatic changes context.
- Accomplishment of integrated pest and disease control.
- Extension of potato fertilizers resources assortment.
- Promotion of organic potato agriculture concept.
- Promotion of potato precision agriculture.
- Efficient utilization of production through yield increase and potato products diversification.
- Elaboration of modernized technological sequences for energetically utilization of biomass production.

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Technological sequences:

- **crop rotation**
- **organic fertilizing**
- **fertilizing with NPK and micro-elements**
- **planting periods**
- **planting densities**
- **weeds, pests and diseases monitor**
- **weeds, pests and diseases control**
- **harvest on dynamic**

Field observations:

- **dynamics of plants growth and development**
- **dynamics of yield formation**
- **weeds, pest and diseases monitor**
- **yield structure on potato maturity**
- **soil electric conductibility, soil humidity, agro-chemical analyses.**
- **measurements:**
  - **reflecting (NDVI),**
  - **chlorophyll,**
  - **photosynthesis,**
  - **transpiration,**

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Laboratory observations and determinations:

Technological and culinary qualities:
- starch content, cooking characteristics, chips

Plants growth dynamics:
- plants height, offshoots number, leaves length, plants aerial weight

Yield structure (individual measurements)
- tuber numbers, tuber weight, size.

Identification of aphid species from different seed potato areas
Determination on pests presence and attack degree.
- potato rot nematode, wireworms, cutworms, chafer grubs

Determination on tuber diseases attack
- late blight, early blight, silver scurf, common scab, rhizoctonia canker, phytoplasm, verticilium wilt

Studies on potato mechanical damage
- measurements on resilience and damage resistance

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Storage observations and determinations:

- **vegetative dormancy**
  - -number of dormancy days
  - -number, weight, and sprout length
  - -**storage behaviour of new potato lines and varieties.**
  - - physiological damages
  - - storage diseases attack
  - - germination dynamics
- **the influence of agro-phyto-technical factors on storage behaviour**
  - - physiological damage
  - - diseases attack
  - - sprout dynamics
- **the effect of natural and chemical inhibitors on potato storage**
  - - low-temperature storage
  - - high-temperature storage

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RESULTS:

1. Establish favorable crop rotations for durable turn into account of their advantages for yield and environment protection.

Potato yield on durable agriculture system rotation

Nr. Crt.	Observations	2008	2009	2010	Mean	Differences		
						2009-2008	2010-2008	2010-2009
1	Late blight attack-notes	3,75	3,50	3,5	**3,58**	-0,25	-0,25	0
2	Pests attack - notes	2,00	2,25	2,25	**2,17**	0,25	0,25	0
3	Harvested potato hills / 1 sqm.	4,30	6,00	6	**5,43**	1,7	1,7	0
4	Hill average number /ha (thousand)	43,00	60,00	60,00	**54,33**	17	17	0
5	Tuber number/1 sqm.	54,36	56,75	57	**56,04**	2,39	2,64	0,25
6	Average number tubers/hill	12,78	9,42	9,25	**10,48**	-3,36	-3,53	-0,17
7	Tubers weight / 1 sqm. (kg)	4,1	4,15	4,45	**4,23**	0,05	0,35	0,3
8	Potato yield/ ha (t)	41,1	41,5	44,5	**42,37**	0,4	3,4	3
9	Starch content (%)	12,48	11,63	12,0	**12,04**	-0,85	-0,48	0,37
10	Starch yield (t/ha)	5,13	4,8	5,34	**5,09**	-0,33	0,21	0,54
11	Tuber average weight (g)	76,3	74,1	78,5	**76,30**	-2,2	2,2	4,4

- potato yield after leguminous and graminaceae mixture was over 40 t/ha.
- the yield was high on the years with hard climatic conditions also.

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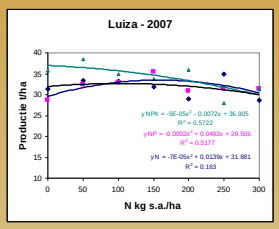
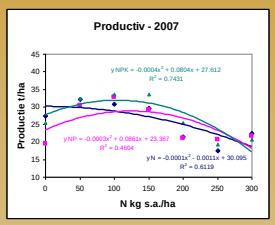
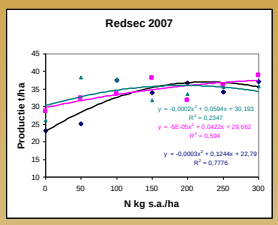
2. Elaboration of modernized, integrated and differentiated technologies on climatic change context.

Response of potato varieties to different NPK levels and ratio







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Technologies (2007-2011)

- 1 modernized technology for Bârsa Country plants, cultivated on rotation in order to achieved agro-climax status;

- 5 ecological technologies for potato, maize, phacelia, tricticale, fodder plants on the frame of ecological module for potato crop rotation;

- 1 technology for maintaining initial potato material using improved technological sequences;

- 1 technology for producing row material necessary for “Baby potatoes” niche product;

- 1 technology for producing and packing “Baby potatoes” niche product;

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Optimization of fertilization according with planting data
(2008 – 2010)

Period	Complex fertilize	Yield		Processed yield		Tuber average mass	
		t/ha	Duncan test	t/ha	Duncan test	grame	Duncan Test
1	C15:15:15	31.9	B	28,6	B	61,6	B
	C11:9:20	36.3	A	32,9	A	67,1	A
2	C15:15:15	28.9	D	25,8	D	58,0	C
	C11:9:20	29.6	C	26,6	C	58,0	C
Average	Epoch 1	34.1	-	30,8	-	64,4	-
	Epoch 2	29.2	- 4,9 º	26,2	- 4,6 º	58,0	- 6,4 º
	C15:15:15	30.4	-	27,2	-	59,8	-
	C11:9:20	32.9	+ 2,5 *	29,7	+ 2,5 *	62,6	+ 2,8 *

p = 5 %

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The mean effect of variety and density on ware potato yield structure
Braşov 2007 - 2009

Specificare	Total		> 55mml		30 – 55 mm		20 – 30 mm		< 20 mm	
	T / ha	Test Duncan	T / ha	Test Duncan	T / ha	Test Duncan	T / ha	Test Duncan	T / ha	Test Duncan
Varieties										
Dacia	40.6	CD	7.0	CD	29.0	A	3.9	A	0.8	A
Gazore	35.9	DE	4.9	D	27.1	A	3.2	B	0.8	A
Desireé	53.0	A	34.4	A	17.2	C	1.0	D	0.4	D
Santé	44.7	BC	22.3	B	21.1	BC	1.0	D	0.3	D
Rosara	32.8	E	9.0	C	21.7	B	1.7	C	0.5	C
Roclas	47.4	B	19.3	B	25.9	A	1.8	C	0.4	C
Planting distances										
15 cm	44.6	A	15.0	B	26.1	A	2.9	A	0.6	A
20 cm	39.4	B	13.9	B	23.2	B	1.8	B	0.5	B
25 cm	43.3	A	19.5	A	21.7	B	1.6	B	0.4	B
Total										
T/ha	42.4		16.1		23.7		2.1		0.5	
CV %	14.0		21.6		17.9		30.0		29.7	

p= 5 %

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Dominant weeds on Bârsa country

*Chenopodium album (*Fat-hen*),*
*Sinapis arvensis (*Field mustard*),*
*Polygonum lapatifolium (*Curlytop knotweed*),*
*Galeopsis tetrahit (*Common Hemp-nettle*),*
*Galinsoga parviflora (*Gallant soldier*),*
*Setaria glauca (*Yellow foxtail*),*
*Echinocloa cruss- galli (*Barnyard grass*),*
*Convolvulus arvensis (*Field birdweed*),*
*Cirsium arvense (*Creeping thistle*),*
*Veronica hederifolia (*Ivy-leaved speedwell*),*
*Sonchus arvensis (*Sow thistles*),*
*Agropyron repens (*Couch grass*)*
*Gallium aparine (*Cleavers*),*
*Amaranthus retroflexus (*Common amaranth*)*

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3. Integrated weeds, pests and diseases control

Potato weeds management

- **selective products for potato and useful flora and fauna**
- **better results using harrowing and herbicides**
- **treatments only on the rows or in the weeds islands**
- **solutions for reducing residual effects**
- **reduction of environmental pollution by using micro-herbicides**

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Disease presence and intensity of potato late blight in Bârsa Country 2007-2011

Disease intensity	Year
medium	2007
severe	2008, 2009, 2011
very severe	2010

Clones and varieties tested for late blight resistance 2007-2011

Year	No. of clones and varieties
2007	31
2008	28
2009	26
2010	22
2011	18

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Integrated potato late blight management

- Cultivation of resistant varieties
- Planting healthy material
- Compliance of cultural measures (fertilization, planting period, ridging and weeds destroy, irrigation)
- Elimination of outbreaks of infection (solanaceae weeds, volunteers, haulum destruction)
- Apply fungicides using a disease forecasting system based on weather monitoring, alternate products (contact and systemic) to prevent resistance
- Reduce storage losses (no more than 5% tubers with blight)

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The influence of climatic conditions on late blight attack and potato yield (2007 – 2011)

Year	Observations	Relative yield %*)	App	Products
2011	June rains accompanied by high temperatures have led to the late blight early (June, 21). From July to the end of the potato growing season rainfall was increasingly reduced, represented only 53.5-39.2% from the multi-annual average.	179,0	8	contact+systemic
2010	Epidemic phase of the disease was devastating and quickly installed (late blight apparition July 1st). In July and August rains continued the disease evolutionary process and accompanied by high temperatures contributed to the foliage drying.	126,5	8	contact+systemic
2009	Lot of rainfalls accompanied by high temperatures. Late blight appearance (June, 29) and growth of attack intensity on the foliage cause high defoliation process.	137,3	8	contact+systemic
2008	Sharp drought at June beginning. Late blight incidence grow on foliage in July due to rainfalls accompanied by high temperatures (late blight apparition in July, 31)	129,6	5	contact+systemic
2007	Sharp drought and high temperatures (late blight appeared in August 20) Fungus sporulation capacity was very low and hasn't been registered the epidemic level of the disease.	119,8	4	contact

*) untreated = 100 %

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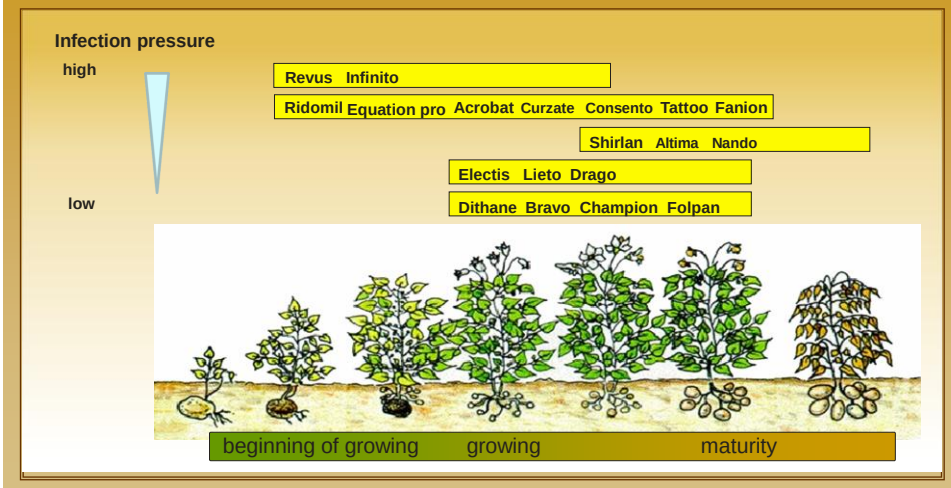
Technological sequence recommended for potato late blight control



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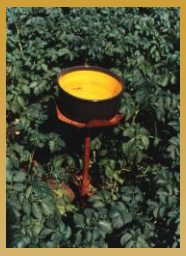
3. Integrated potato weeds, pests and diseases control

Aphid flight monitor 2007-2011

Crop: potato



- **Species identification:**
  - Identified species: 70 species
    - PVY vectors-15
    - PLRV vectors-12
- **Identification of colonizing and non-colonizing species**
- **Elaboration of a date base**
- **Determination of abundance and dominance for each species**
  - **sub-recedent species (0-1%);**
  - **recedent species (1,1-2%);**
  - **sub-dominant species (2,1-5%);**
  - **dominant species (5,1-10%);**
  - **eu-dominant species (>10,1%)**
- **Elaboration of flight curves on dynamics for each year and location**
- **Calculation of cumulative aphid vector pressure for each year and location**

Acyrthosiphon pisum (Harris)
Amphorophora rubi (Kaltenbach)
Anoecia corni (Fabricius)
Anoecia sp.
Anoecia vagans (Koch)
Anuraphis farfarae (Koch)
Anuraphis subterranea (Walker)
Aphis craccae Linnaeus
Aphis craccivora Koch
Aphid fabae Scopoli
Aphis frangulae Kaltenbach
Aphis gossypii Glover
Aphis idaei van der Goot
Aphis nasturtii Kaltenbach
Aphis nerii Boyer de Fonscolombe
Aphis pomi de Geer
Aphis sambuci Linnaeus
Aphis spiraecola Patch
Aphis verbasci Schrank
Aphis sp.
Aulacorthum solani (Kaltenbach)
Brachycaudus helichrysi (Kaltenbach)
Brevicoryne brassicae (Linnaeus)
Capitophorus elaeagni (del Guercio)
Chaitophorus populialbae (B. de Fonsc.
Capitophorus similis van der Goot
Cavariella aegopodii (Scopoli)
Cavariella pastinacea (Linnaeus)
Corylobium avelanae (Schrank)
Cryptomyzus galeopsidis (Kaltenbach)
Cryptomyzus ribis (Linnaeus)
Dactynotus sp.
Dysaphis plantaginea (Passerini)
Dysaphis pyri (B. de Fonscolombe)
Eriosoma ulmi (Linnaeus)
Forda marginata Koch
Hayhurstia atriplicis (Linnaeus)
Hyadaphis foeniculi (Passerini)
Hyalopterus pruni (Geoffroy)
Hyperomyzus lactucae (Linnaeus)
Kallistaphis bassalis Mordvilko
Macrosiphoniella abrotani (Walker)
Macrosiphum euphorbiae (Thomas)
Macrosiphum funestum (Macchianti)
Macrosiphum rosae (Linnaeus)
Metopolophium dirhodum (Walker)
Megoura viciae Buckton
Microlophium carnosum (Buckton)
Myzocallis castanicola Baker
Myzus persicae (Sulzer)
Ovatus sp.
Pemphigus sp.
Periphyllus sp.
Phorodon humuli (Schrank)
Phyllaphis fagi (Linnaeus)
Potrama flavescens (Koch)
Potrama ranunculi (del Guercio)
Potrama sp.
Pterocallis alni (de Geer)
Rhopalosiphum nymphaeae (Linnaeus)
Rhopalosiphum padi (Linnaeus)
Sitobion avenae (Fabricius)
Sitobion fragariae (Walker)
Sypha elegans del Guercio
Sypha glyceriae (Kaltenbach)
Tetraneura ulmi (Linnaeus)
Thecabius affinis (Kaltenbach)
Therioaphis trifolii (Monell)
Uroleucon sp.
Uromelan sp.

70 DIFFERENT APHID SPECIES IDENTIFIED ON SEED POTATO CROPS

BRASOV 2007-2011

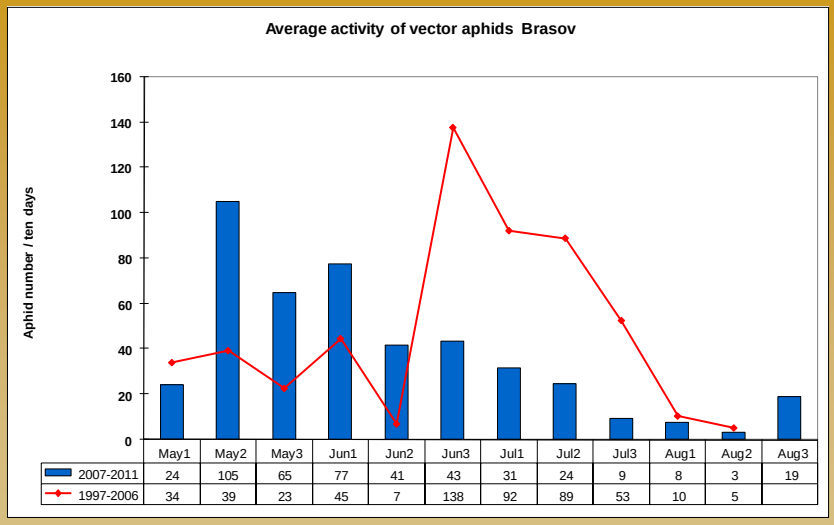
Aphid species capable of transmitting PVY:

Species	Common Name	PVY Index
Myzus persicae	Peach-Potato Aphid	1.00
Acyrthosiphon pisum	Pea Aphid	0.70
Aphis nasturtii	Buckthorn-Potato Aphid	0.40
Rhopalosiphum padi	Bird Cherry-Oat Aphid	0.40
Metopolophium dirhodum	Rose-Grain Aphid	0.30
Brachycaudus helichrysi	Leaf-Curling Plum Aphid	0.21
Macrosiphum euphorbiae	Potato Aphid	0.20
Aulacorthum solani	Glasshouse and Potato Aphid	0.20
Myzus ascalonicus	Shallot Aphid	0.20
Myzus ornatus	Violet Aphid	0.20
Rhopalosiphoninus latysiphon	Bulb and Potato Aphid	0.20
Hyperomyzus lactucae	Currant-Sowthistle Aphid	0.16
Aphis fabae	Black-Bean Aphid	0.10
Brevicoryne brassicae	Cabbage Aphid	0.01
Sitobion avenae	Grain Aphid	0.01

Crop colonisers are highlighted.

Aphid species capable of transmitting PLRV:

Species	Common Name	PLRV Index
Myzus persicae	Peach-Potato Aphid	1.00
Aulacorthum circumflexum	Mottled Arum Aphid	0.90
Aphis gossypii	Melon and Cotton Aphid	0.50
Myzus ornatus	Violet Aphid	0.30
Aphis fabae	Black-Bean Aphid	0.30
Myzus ascalonicus	Shallot Aphid	0.30
Aulacorthum solani	Glasshouse and Potato Aphid	0.30
Rhopalosiphoninus latysiphon	Bulb and Potato Aphid	0.30
Aphis nasturtii	Buckthorn-Potato Aphid	0.25
Macrosiphum euphorbiae	Potato Aphid	0.15
Phorodon humuli	Damson-Hop Aphid	0.12
Rhopalosiphoninus staphyleae	Mangold Aphid	0.10



	May1	May2	May3	Jun1	Jun2	Jun3	Jul1	Jul2	Jul3	Aug1	Aug2	Aug3
2007-2011	24	105	65	77	41	43	31	24	9	8	3	19
1997-2006	34	39	23	45	7	138	92	89	53	10	5	

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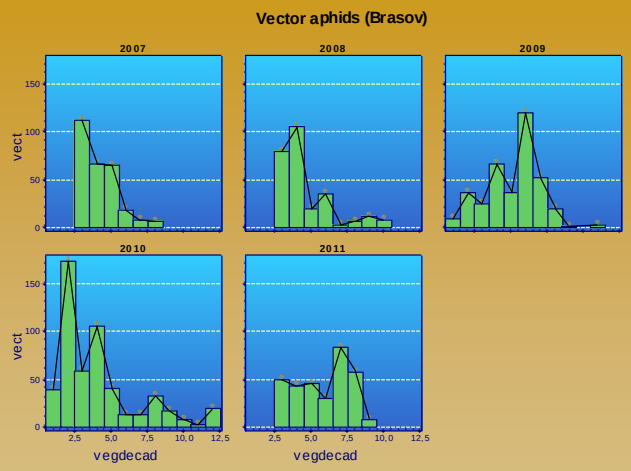

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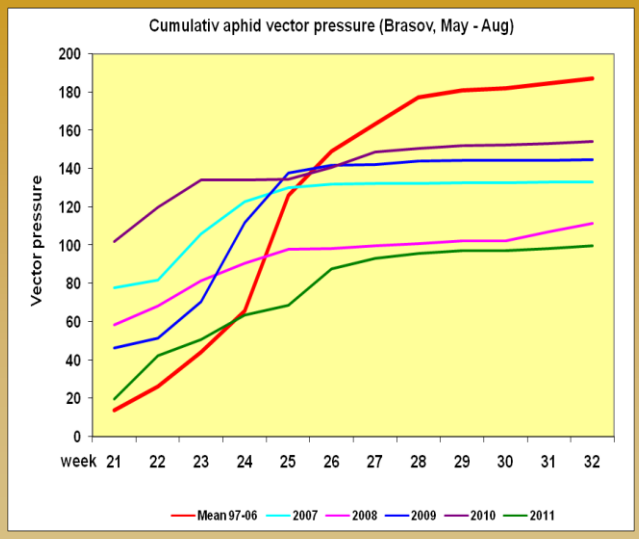

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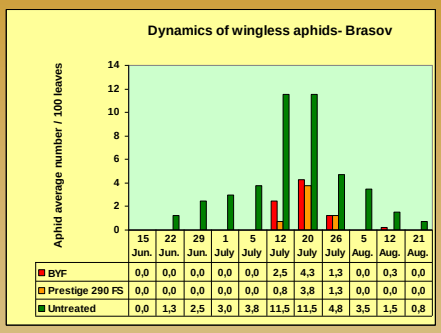
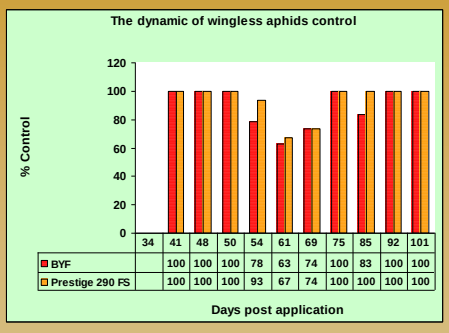
Wingless aphids control through seed potato treatments



	15 Jun.	22 Jun.	29 Jun.	1 July	5 July	12 July	20 July	26 July	5 Aug.	12 Aug.	21 Aug.
BYF	0,0	0,0	0,0	0,0	0,0	2,5	4,3	1,3	0,0	0,3	0,0
Prestige 290 FS	0,0	0,0	0,0	0,0	0,0	0,8	3,8	1,3	0,0	0,0	0,0
Untreated	0,0	1,3	2,5	3,0	3,8	11,5	11,5	4,8	3,5	1,5	0,8



	34	41	48	50	54	61	69	75	85	92	101
BYF		100	100	100	78	63	74	100	83	100	100
Prestige 290 FS		100	100	100	93	67	74	100	100	100	100

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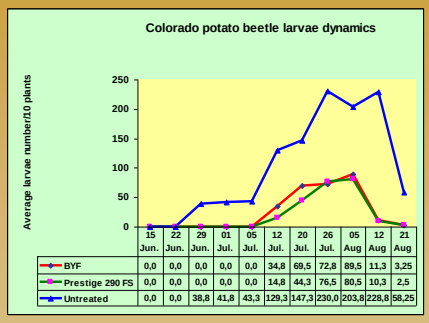
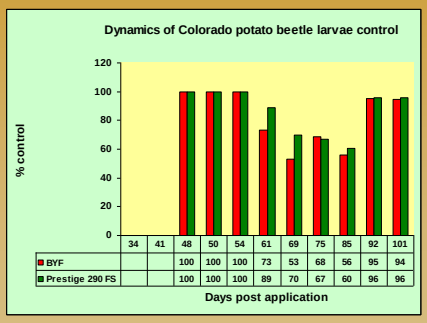
Colorado beetle control through seed potato treatments



	15 Jun.	22 Jun.	29 Jun.	01 Jul.	05 Jul.	12 Jul.	20 Jul.	26 Jul.	05 Aug	12 Aug	21 Aug
BYF	0,0	0,0	0,0	0,0	0,0	34,8	69,5	72,8	89,5	11,3	3,25
Prestige 290 FS	0,0	0,0	0,0	0,0	0,0	14,8	44,3	76,5	80,5	10,3	2,5
Untreated	0,0	0,0	38,8	41,8	43,3	129,3	147,3	230,0	203,8	228,8	58,25



	34	41	48	50	54	61	69	75	85	92	101
BYF			100	100	100	73	53	68	56	95	94
Prestige 290 FS			100	100	100	89	70	67	60	96	96

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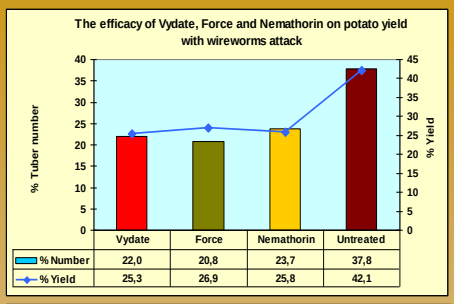
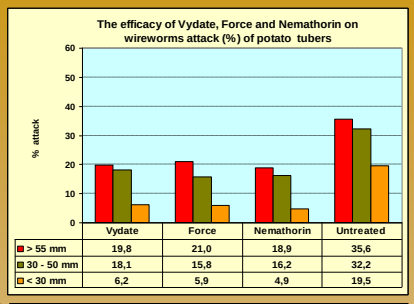
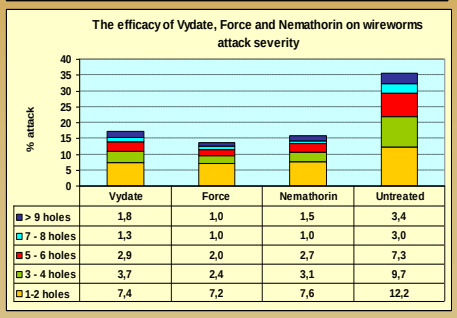
The effect of soil treatments on potato wireworms



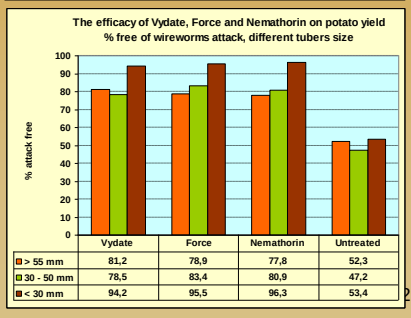
	Vydate	Force	Nemathorin	Untreated
% Number	22,0	20,8	23,7	37,8
% Yield	25,3	26,9	25,8	42,1



	Vydate	Force	Nemathorin	Untreated
> 55 mm	19,8	21,0	18,9	35,6
30 - 50 mm	18,1	15,8	16,2	32,2
< 30 mm	6,2	5,9	4,9	19,5

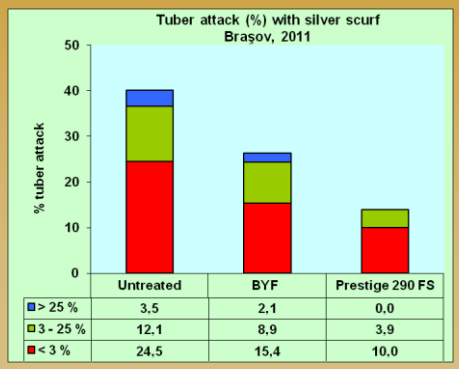


	Vydate	Force	Nemathorin	Untreated
> 9 holes	1,8	1,0	1,5	3,4
7 - 8 holes	1,3	1,0	1,0	3,0
5 - 6 holes	2,9	2,0	2,7	7,3
3 - 4 holes	3,7	2,4	3,1	9,7
1-2 holes	7,4	7,2	7,6	12,2

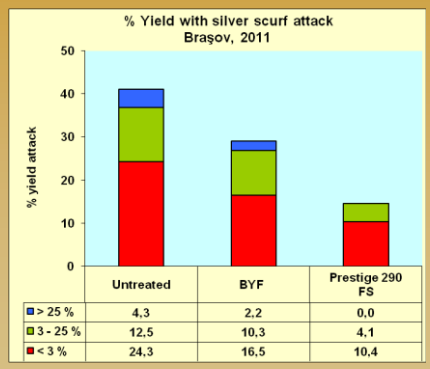


	Vydate	Force	Nemathorin	Untreated
> 55 mm	81,2	78,9	77,8	52,3
30 - 50 mm	78,5	83,4	80,9	47,2
< 30 mm	94,2	95,5	96,3	53,4

Potato seed treatments effects on silver scurf (*Helminthosporium solani*)



	Untreated	BYF	Prestige 290 FS
> 25 %	3,5	2,1	0,0
3 - 25 %	12,1	8,9	3,9
< 3 %	24,5	15,4	10,0



	Untreated	BYF	Prestige 290 FS
> 25 %	4,3	2,2	0,0
3 - 25 %	12,5	10,3	4,1
< 3 %	24,3	16,5	10,4

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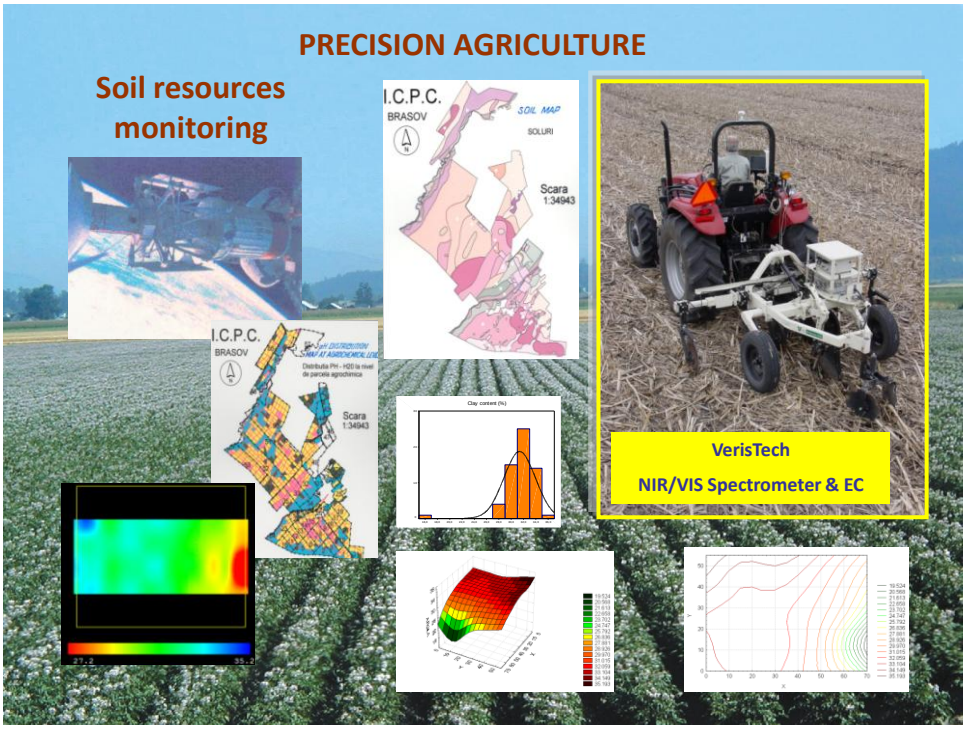

PRECISION AGRICULTURE

Status of crop potato monitoring

Chlorophyll meter

SPAD - 502

CROPSCAN

Multispectral Radiometers

LCi Portable

Photosynthesis System

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Researches:

-spatial variation of soil electrical conductivity (CE) related with soil resources (agrochemicals index).

-day time variation of canopy reflectance and physiological measurements (photosynthesis, transpiration, chlorophyll content), related with vegetation status of 14 potato varieties.

-dynamics and NDVI vegetation index, chlorophyll content, photosynthesis and transpiration, related with phenological development and health of potato crops.

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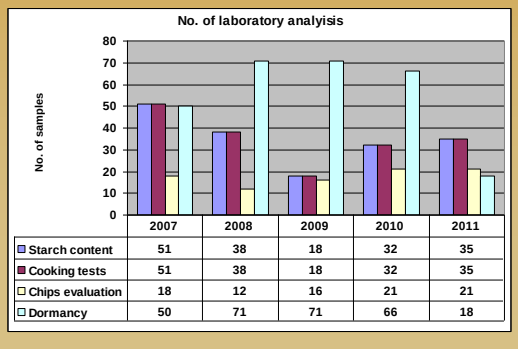
5. Efficient yield turning into account through increasing qualities and potato products diversification

- qualitative evaluation of potato lines and varieties on breeding-selection process.
- the influence of cropping and storage technological measures on potato qualities.
- diversification of potato products

Lab culinary and technological analisys



	2007	2008	2009	2010	2011
Starch content	51	38	18	32	35
Cooking tests	51	38	18	32	35
Chips evaluation	18	12	16	21	21
Dormancy	50	71	71	66	18

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Researches on potato products diversification

-the influence of technological parameters (variety and planting density) on production dynamics and culinary qualities of:

- ZAMOLXIS,
-GASORE,
-DESIREE,
-SANTE,
- - ROSARA
- - ROCLAS

- varieties grown on three planting distances: 15 - 20 - 25 cm, in order to establish a fresh raw material conveyer for ***baby potatoes*** turning into account.

During 2007- 2010, potato tubers with 20-30 mm diameter were harvested on dynamics from crops placed on non-irrigated Brasov's chernozem soil.

Each plant was analyzed through individual measurements:

-development of aerial plant
- tuber number
- weight
- culinary qualities

Varieties suitability - Roclas, Zamolxis, Gasore, Rosara, Desiree, Sante

- favorable accumulation dynamics;
- high number of tubers / hill, characteristics to varieties;
- tubers gradually increase;
- good culinary characteristics

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The influence of planting distances on *baby potatoes* yield parametres

Distance		Yield 20 - 30 mm t/ha	Total yield t/ha	% Yield 20-30 mm	No 20-30 mm / sqm	Total No tubers / sqm	% No tubers
15 cm	Mean	2,7	19,5	22,8	26,4	104,4	26,2
	Std. Deviation	2,5	15,4	25,4	24,3	53,0	26,6
20 cm	Mean	1,9	18,4	19,9	18,7	84,2	22,3
	Std. Deviation	1,7	19,3	23,3	16,1	40,9	16,0
25 cm	Mean	1,8	16,3	23,3	17,4	69,3	24,5
	Std. Deviation	1,8	14,0	26,7	16,8	36,9	20,2
Total	Mean	2,1	18,1	22,0	20,8	86,0	24,3
	Std. Deviation	2,1	16,4	25,2	19,8	46,3	21,4

Potato niche products

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The influence of varieties on *baby potatoes* yield parametres

Variety		Yield 20 - 30 mm t/ha	Total yield t/ha	% Yield 20-30 mm	No 20-30 mm / sqm	Total No tubers / sqm	% No tubers
Zamolxis	Mean	2,6	20,7	18,4	29,0	115,7	23,4
	Std. Deviation	2,7	18,5	22,6	29,2	47,0	21,4
Gasore	Mean	4,5	18,8	31,3	43,1	153,4	29,0
	Std. Deviation	2,9	13,0	23,4	25,4	47,5	14,9
Desireé	Mean	2,5	20,6	25,8	24,7	75,7	32,4
	Std. Deviation	2,0	12,9	30,5	19,9	29,6	19,8
Santé	Mean	2,4	27,4	19,3	21,4	105,6	20,6
	Std. Deviation	2,5	17,8	26,4	21,5	48,2	16,9
Rosara	Mean	1,7	13,5	18,6	17,1	100,6	16,9
	Std. Deviation	1,4	10,6	19,7	12,4	39,3	11,6
Roclas	Mean	2,4	16,1	23,0	23,1	75,4	35,0
	Std. Deviation	2,4	15,4	28,0	26,6	61,2	51,0
Total	Mean	2,7	19,5	22,8	26,4	104,4	26,2
	Std. Deviation	2,5	15,4	25,4	24,3	53,0	26,6

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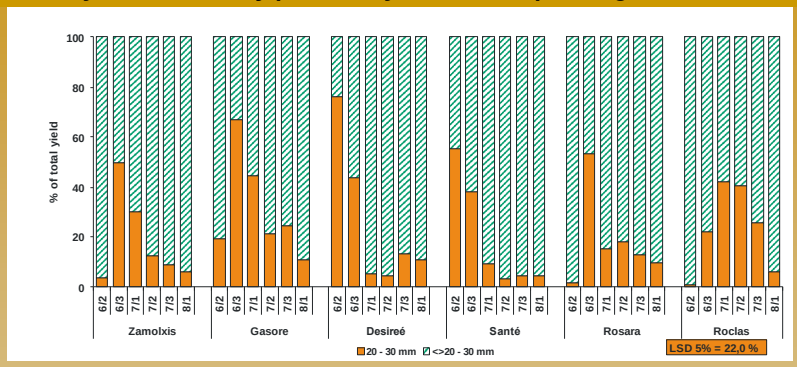
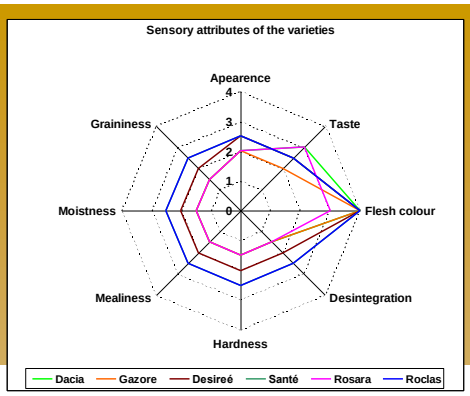
Dynamics of *baby potatoes* yield - 15 cm planting distance



Culinary characteristics

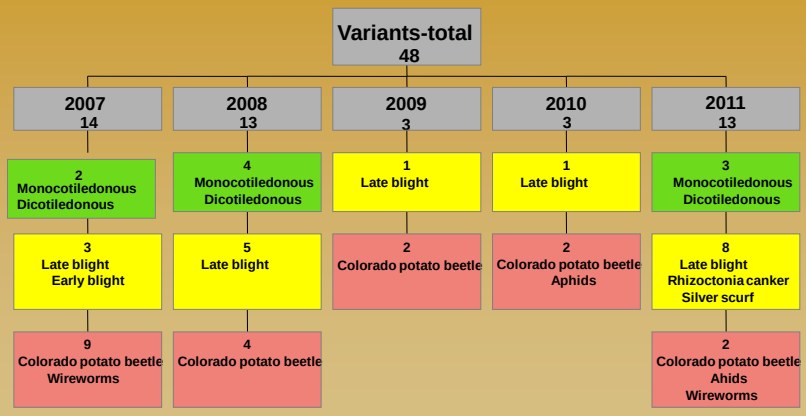
- baby potatoes



VARIETY		Apearence	Taste	Flesh color	Desintegration	Hardness	Mealiness	Moistness	Graininess	Dark colouring	Yellowness	Boiling time min.	Culinary class index
Zamolxis	Mean	2,2	2,8	3,4	1,9	2,1	1,6	2,6	1,0	2,4	2,3	26,0	9,3
	Std. Deviation	,6	,3	,8	,7	,3	,9	,6	,0	,5	,5	2,1	2,0
Gasore	Mean	2,4	2,6	4,4	1,8	1,8	1,1	2,4	1,0	1,6	2,8	22,7	8,1
	Std. Deviation	,3	,4	,5	,7	,4	,2	,6	,0	,5	,7	3,4	1,1
Desireé	Mean	1,2	2,5	4,1	1,0	2,0	1,7	2,3	1,0	3,1	3,2	28,6	8,0
	Std. Deviation	,3	,4	,2	,0	,4	,8	,4	,0	,3	,9	3,5	1,5
Santé	Mean	1,6	2,7	4,1	1,3	1,7	1,3	2,3	1,0	2,0	3,1	28,7	7,6
	Std. Deviation	,4	,4	,3	,4	,2	,5	,4	,0	,5	,4	4,5	,6
Rosara	Mean	1,3	2,7	5,1	1,0	2,0	1,0	1,7	1,0	3,0	3,8	32,7	6,7
	Std. Deviation	,5	,4	,7	,0	,0	,0	,4	,0	1,3	,4	4,8	,4
Roclas	Mean	1,9	2,4	4,4	1,5	2,0	1,3	2,6	1,0	2,3	2,0	30,0	8,4
	Std. Deviation	,6	,3	,5	,4	,0	,2	,5	,0	,7	,4	4,3	,7
Total	Mean	1,8	2,6	4,3	1,4	1,9	1,3	2,3	1,0	2,4	2,9	28,1	8,0
	Std. Deviation	,6	,4	,7	,6	,3	,6	,6	,0	,9	,8	4,8	1,4

2

Variants number introduced on potato weeds, pests and diseases control, 2007-2011



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6. Extension of fertilizing resources and pesticides on potato.

Total value of contracted tests with international private firms 2007-2011

Year	Firms number	Number of contracted testes	Total Euro
2007	10	42	37,959
2008	8	46	36,394
2009	4	23	19,226
2010	4	18	14,400
2011	8	22	47,323
Total:	34	151	155,302

GEP accreditation - Directive European Council 91/414/CE (GLP+GAP)

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• ex

Year	Soil basic fertilizer		Foliar fertilizer	
	Variants	Relative average yield %	Variants	Relative average yield %
2007	5	130.6	10	116.9
2008	6	126.1	7	126.8
2009	6	120.2	9	107.0
2011	4	118.7	22	108.3
Total	21	*	48	*
Average	*	123.9	*	114.8

Research contracts with INCPA Bucureşti

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7. Elaboration of modernized technological sequences to produce biomass energetically turning to account.

PS 6.3.9. Projection and promotion of technologies to produce unconventional energy used in farm

Biomass exploitation through energetical conversion:

- Better utilization of farm specifically resources;
- Utilization of crop technologies and methods to produce biofuel avoiding ecological unbalance;
- Posibility to recycling resources utilizing secundary products from vegetable production and animal farms.

Energetically equivalent /ha of biomass as main crop -2009

Echivalentul energetic calculat la ha al biomasei producție principală, realizată în anul 2009

Cultura	Producția de biomasă t/ha	Producția de biomasă s.u. t/ha	Producția de biogaz mc/ha	Producția de biodiesel l/ha	Producția echivalentă de bioetanol l/ha	Echivalent energetic MJ/ha
Sfeclă rădăcini	61,7	15,42	2160	-	6170	132.038
Cartof	45,6	10,41	-	-	3780	80.892
Cereale boabe	3,494	3,01	-	-	1338	28.639
Cereale paie	3,378	2,70	1160	-	-	46.751
Porumb siloz *	46,4	16,24	3475	-	3108	66.528
Porumb siloz **	45,0	24,3	5200	-	3015	64.521
Rapiță	2,672	2,29	-	1149	-	39.450
Lucernă *	23,05	8,07	-	-	-	76.665
Lucernă **	45,45	9,04	-	-	-	85.880
Sorg zaharat ****	72,7	30,78	9849	-	9287	198.766
Phalaris **	43,7	9,75				92.625
Amestec ierburi **	38,08	7,77				131.467
Amestec ierburi ***	16,17	3,30	-	-	-	35.640
Media:						83.066

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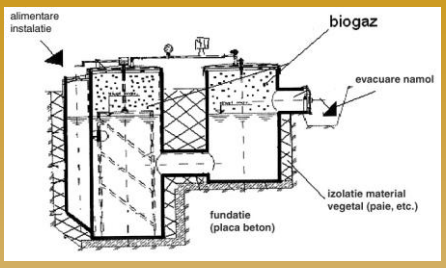
Schema constructivă a reactorului tip INMA Bucureşti pentru producerea de biogaz



Effects on farm:

- Reducing energetically dependence from farms classical energy;
- Maximalize the expenses
- Maximalize labour
- Reducing negative impact on environment

8. Promotion of potato organic farming

SCG project (World Bank project)

-Ecological certified seed:
- -potato
- -cereals
- -phacelia
- -maize

- land converting
- organic fertilizing
- suitable varieties to organic farming
  - **potato : RUSTIC**
  - **triticale: TITAN**
  - **maize: de FĂGĂRAŞ**
  - **phacelia: BALLO**
- mechanized maintenance
  - **-Mechanical weeding**
  - -Weeds, pests and diseases ecological control
  - **-Field observations**
  - **-Late blight ecological treatments**
  - **-Colorado potato beetle mechanical control (ECG vice)**

Manual control of Colorado beetle

Mechanical control of Colorado beetle

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Projects/contracts finalized 2007-2011

COORDINATOR:

PS 6.1.4. Identifying niche products, products with competitive advantage, the Romanian brands

PS 6.3.9. Projection and promotion of technologies to produce unconventional energy used in farm

PARTNER:

P.S. 2.4.1. Setting up of integrated control systems with minimum impact on the environment

P.S. 5.1.2. Introduction of secondary processing methods of agricultural production in order to obtain products requested by the market, like starch, iso-glucose, pectin, malt, germs and vegetable oils

PN 51 097 Assessing the effect on global warming on potato production safety monitoring physiological reactions at the level of plant and culture

CEEX 131 Technological multifunctional system for growth and use of useful insects

CEEX 43 Research to promote an alternative technology for organic control of Colorado beetle in potato crop

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Ongoing projects/contracts

COORDINATOR:

PS 2.2.2. Innovative technology to reduce agro-ecosystem vulnerability from potato and sugar beet crops given to re-emerging harmful agents and decreasing methods

PS 2.2.3. Technical –organization systems and data base for prognosis, monitoring and control of *Clavibacter michiganensis* ssp. *sepedonicus*-ring rot of potato

PARTNER:

PS 2.2.1. Integrated studies – genotypes, phenotypes, qualitative and technological, concerning ecological seed producing from cereals, grain legumes and industrial crops, fodder, medicinal and aromatic plants

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Sugar beet - Specific objectives:

- **Settlement of favorable crop rotation for durable turning into account of their advanteges for yield and enviroument protection.**
- **Elaboration of modernised technological sequences for producing energetically turning into account biomass.**
- **Utilization of new fertilizing resources for yield and extraction output increase.**
- **Integrated pest and diseases control.**

Activities on field and laboratories 2007 - 2011

Studied technological sequences:

-crop rotation
- fertilization with manure
- fertilization with NPK and micro-elements
- sowing periods
- sowing densities
- pests and diseases monitor
- harvest periods

• Observations on field:

- plants spring
- dynamics of plants development
- main pests and diseases monitor
- technical ripeness
- yield capacity

• On laboratory:

- sugar content

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▪ **Settlement of favorable crop rotation for durable turning into account of their advanteges for yield and enviroument protection point of view.**

Studied crops:

Leguminous + perennial graminaceae (70% +30 %)
-Trifolium pratense
-Trifolium repens
- Lothus corniculatus
- Festuca pratensis
- Dactylis glomerata
- Lolium perene
- Phleum pratensis
Potato
Sugar beet
Two-rows barley
Fodder maize
Annual fertilizing with NPK (15,15,15)(300 kg a.i)/ha

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Results 2007-2011

Observations and results	2008	2009	2010	Average
Foliar diseases attack -notes	3.5	1.5	3.37	2.79
Number of harvested roots /sqm	8.8	9.9	10	9.55
Number of roots /ha (thousands)	87.5	99	100	95.5
Roots weight/sqm (kg)	6.2	7.1	7.4	6.89
Average roots weight (kg)	0.79	0.73	0.74	0.75
Root yield /ha (t)	61.8	71.7	74	69.15
Leaves+colete weight /sqm (kg)	5.9	4.9	7.3	5.99
Leaves/roots relation	1.0	0.92	0.98	0.95
Sucrose content (%)	16.0	16.7	16.8	16.5
Sugar yield (t/ha)	9.4	11.9	12.4	11.23

- The highest yield output on potato, two-rows barley and fodder maize was after leguminous+ perennial graminaceae, which remains 2 years on field
- On sugar beet the highest yield output was after two-rows barley which has as forerunner clover +perennial graminaceae

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Sugar beet roots yield on rotation in durable agriculture system
Bârsa Country

Variant	-	2009	2010	Yield t/ha	Yield differences	Significance
V4 Check	Sugar beet	-	-	61.8	-	-
V3	Two-rows barley	Sugar beet		71.7	9.9	***
V9	Leguminous+ graminaceae I	Sugar beet	-	77.0	15.20	***
V2	Potato	Two-rows barley	Sugar beet	74.2	12.45	***
V8	Leguminous+ graminaceae I	Two-rows barley	Sugar beet	80.0	18.20	***
V14	Leguminous+ graminaceae I	Leguminous+ graminaceae II	Sugar beet	74.0	12.20	***

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•**Elaboration of modernised technological sequences for producing energetically turning into account biomass**

Poly-factorial field experiences with:

- sugar beet hybrids
- organic fertilization levels
- mineral fertilization levels
- planting densities

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Root yield (t/ha)

Interaction hybrid x soil resources (2007-2009)

Productia de radacini in tone
Interactiunea hibrid x agrofond A x B (anul 2007-2009) (t/ha)

Hibrizi (Hibryds))	Îngrăşăminte *(Fertiliser)*	Productia de radacini *(Root production)*	%	Diferenţă *(Difference)*	Semnificatie *(Meaning)*
CHIARA	Nefertilizat *(Unfertilize)*	40,9	100,0	0,0	Mt
EVELINA	Nefertilizat *(Unfertilize)*	39,5	96,6	-1,4	
CHIARA	30t gunoi/ha *(30t manure/ha)*	65,9	100,0	0,0	Mt
EVELINA	30t gunoi/ha *(30t manure/ha)*	64,5	97,9	-1,4	
CHIARA	40t gunoi/ha *(40t manure/ha)*	73,1	98,0	-1,5	Mt
EVELINA	40t gunoi/ha *(40t manure/ha)*	71,9	96,4	-2,7	
CHIARA	600kg/haNPK	68,5	100,0	0,0	Mt
EVELINA	600kg/haNPK	68,3	99,7	-0,2	
CHIARA	900kg/haNPK	77,9	97,9	-1,7	Mt
EVELINA	900kg/haNPK	81,2	102,0	1,6	
				DL 5%	7,4
				DL 1%	12,4
				DL 0,1%	26,6

Interaction hybrid x density (2007-2009)

Productia de radacini
Interactiunea hibrid x densitate A x B (anul 2007-2009) (t/ha)

Hibrizi (Hibryds)	Densitati *(Densities)*	Productia de radacini *(Root production)*	%	Diferenţă *(Difference)*	Semnificatie *(Meaning)*
Media /densitate *(Average /*		78,9	100,0	0,0	Mt
Canaria	100000	74,5	94,4	-4,4	o
Diamant	100000	78,4	99,3	-0,5	
Rustica	100000	78,4	99,3	-0,5	
Chiara	100000	81,4	103,1	2,5	
Evelina	100000	82,0	103,9	3,1	
Media /densitate *(Average /*		74,9	100,0	0,0	Mt
Canaria	65000	72,3	96,5	-2,6	
Diamant	65000	72,2	96,3	-2,7	
Rustica	65000	76,4	101,9	1,5	
Chiara	65000	75,3	100,5	0,4	
Evelina	65000	78,5	104,8	3,6	*
				DL 5%	3,5
				DL 1%	6,8
				DL 0,1%	10,1

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- the highest average of biological sugar /ha was recorded on variant fertilized with 40 t manure /ha (13.5 sugar/ha)

- 3 years mean, the highest ethanol production /ha was -9.087,2 l /ha, recorded with Chiara variety fertilized with 40 t manure/ha

-this variant has the lowest cost price/ ethanol litre (0.55 lei / l)

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Utilization of new fertilizing resources for yield and extraction output increase.

Year	Soil basic fertilizer		Foliar fertilizer	
	Variants	Relative average yield %	Variants	Relative average yield %
2007	0	0	0	0
2008	6	104.3	9	106.3
2009	6	108.9	11	104.8
2010	0	0	0	0
2011	0	0	10	106.2
Total	12	*	30	*
Mean	*	106.6	*	105.7

Contracts with INCPA Bucharest

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Aphid flight monitor 2007 – 2010

Crops on rotation:
- sugar beet
- potato
- cereals
- leguminous

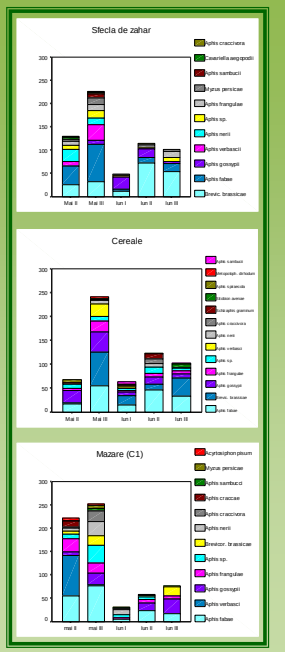
Species identification
- species identified: 60 species

Elaboration of a date base

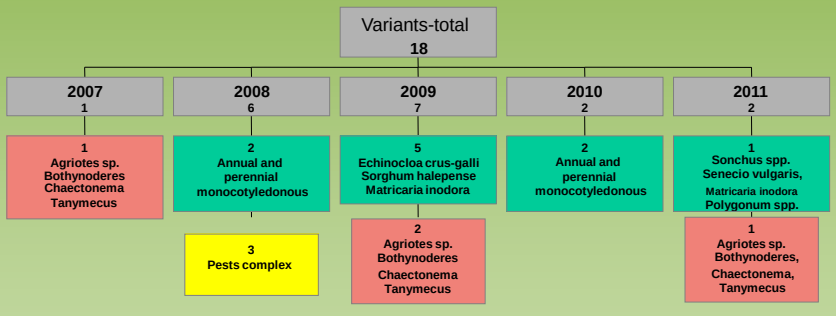
Determination of abundance and dominance for each species

sub-recedent species (0-1%);
recedent species (1,1-2%);
sub-dominant species (2,1-5%);
dominant species (5,1-10%);
eu-dominant species (>10,1%)

- flight curves on dynamics for each year,location and crop



Variants number introduced on sugar beet weeds, pests and diseases control, 2007-2011



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Unfurl projects between 2007 -2011

COORDINATOR:

PS 2.2.2.: Innovative technology to reduce agro-ecosystem vulnerability from potato and sugar beet crops given to re-emerging harmful agents and decreasing methods.

PS 6.3.9. Projection and promotion of technologies to produce unconventional energy used in farm

PARTNER:

PN II 22099: High energy efficient technology for biogas production in integrated system from biomass in farms in Romania (BIOGEF)

PN II 51 095: Regional technological solutions for sustainable agriculture with a view of agro-climax settlement (STRADA)

CEEX 38: New, unconventional modern technology for superior turning into account of biomass – getting bio-fuel (BIOBENZ)

PS 1.3.1: Multi-functionality turning into account of pastures on sustainable agriculture and environment protection

PN 51010: Support system of decision for precision management of sugar beet harmful agents. (TADES)

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Results dissemination:

-Setting up demo fields on three zones: Braşov, Depresiunea Făgăraş,Vaslui – on the first phase of sowing complex grassland fodder mixture;

-Attended to the International Symposium CIEC –Romanian National Branch ,,Producția de îngrăşăminte cu fosfor şi intensivizarea fertilizării fosfatice – factor important în dezvoltarea producției agricole", Constanța, 24-27.09. 2008 –

Presented paper: EFFECT OF DIFFERENT PRATOTECHNICAL SOLUTIONS RELATED PRODUCTIVITY OF *Nardus stricta* – *Festuca rubra* DOMINATED GRASSLANDS FROM BOREAL ALTITUDINAL LEVEL

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CEREALS
Specific objectives

- varieties characterization: uniformity, wintering resistance, fall, shaken, ear germination, sterility
- varieties characterization upon resistance to pathogens attack
- identification of genotypes capable to turn to the best nitrogen on limited conditions of soil reserves
- determination of productivity elements
  - number of fertile ear / sqm,
  - number of seed on ear,
  - 1000 seed mass,
  - hectolitre mass;
- identification of varieties with thermo-hydro stress resistance.

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Examinations done on field and laboratory 2007 -2011

Studied technological sequences:
- **fertilizing with sub-optimum nitrogen rates.**
-**sowing density**
-**restrictions on diseases control**

- **examinations on field :**
  - **plans rising;**
  - **plants number / sqm in winter entering;**
  - **wintering plants resistance;**
  - **plants density on beginning of spring;**
  - **growth rhythm in spring;**
  - **plants height;**
  - **ear up data;**
  - **fertile ears density;**
  - **resistance to pathogens attack;**
  - **resistance to: drought, ear up germination, fall;**
  - **physiological maturity;**
  - **yield capacity;**
- **on laboratories :**
  - **ear seed number;**
  - **ear seed weight;**
  - **1000 seed mass;**
  - **hectolitre mass.**

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Experiments done 2007 - 2011

Yearly:

In field:

- Autumn wheat - 450 experimental plots and 350 observation plots
- Triticale –225 experimental plots and 250 observation plots.
- Spring two-rows barley - 100 experimental plots

In laboratory:

- **Autumn wheat**
  - 11,250 ears analyzed for ear productivity determination on ear, ear seed number, seed weight, 1000 seed mass.
  - 450 analysis to establish 1000 seed hectolitre mass.
  - 200 samples sent on network to establish gluten content and its qualities
- **Triticale**
  - 5,625 ears analyzed to determine the seed number on ear, seed weight, 1000 seed mass.
  - 225 tests analysed for - 1000 seed mass and hectolitre mass
  - 100 tests sent on network to establish seed protein content

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Behavior of autumn wheat
NIRDPSB Braşov, 2007 - 2010

Autumn wheat varieties	2007	2008	2009	2010	Average
Flamura 85	5160	3852	4690	5387	4772
Ariesan	4692	4270	3210	4989	4290.
Dropia	4975	4490	3540	3888	4223
Apullum	3683	4135	4960	5408	4546
Ardeal	4089	4235	5710	3535	4392
Gasparom	4715	4039	6560	5236	5137
Magistral	4143	4239	4520	4479	4345
Delabrad	5197	2752	5000	4272	4305
Faur	4517	2275	4980	4970	4185
Glosa	5233	-	4060	5249	4847
Gruia	5521	3637	4340	3199	4174
Litera	4778	4844	5740	3955	4829
Turda2000 (T20-94)	4797	5036	4530	3931	4573
Turda 95	5076	3141	5560	4283	4515
Dumbrava	5113	4775	4520	4859	4816

Comparative autumn wheat crops

Wheat varieties tested and selected for seed production, were:

-1-2 days precocious comparative with Ardeal variety.

-productive

-with high resistance to pathogens attack

-field uniformity.

Average plants size, was an indicator for fall resistance. Through precocity, these varieties are resistant to draught, with high yields on dryness years.

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Behavior of triticale varieties
NIRDPSB Braşov, 2007 - 2010

Autumn triticale varieties	2007	2008	2009	2010	Average
Plai	5181	4513	3621	5429	4686
Titan	5039	3610	2890	3505	3761
Trilstar	5132	3845	2985	-	3987
Stil	4834	3893	3158	3483	3842
Gorun	4501	3656	3030	4077	3816
Haiduc	4139	3430	3730	4625	3981
TF 2	5137	3278	2925	4635	3994

After average yield, seven triticale variants were selected.

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Behavior of triticale
NIRDPSB, Brasov 2010

Variant	Wintering resistance	Number of raised plants /sqm	Plants height (cm)	Earing up data	Uniform.	Resistance to:		Ears per /sqm
						Fusarar.	Septoria.	
PLAI	**1**	**507**	**105**	**16.05**	**2**	**1-2**	**2-3**	**491**
TITAN	**1**	**504**	**105**	**17.05**	**1-2**	**1**	**2**	**501**
STIL	**1-2**	**507**	**106**	**16.05**	**1-2**	**1-2**	**2**	**504**
GORUN 1	**1-2**	**501**	**95**	**16.05**	**1-2**	**1-2**	**2-3**	**496**
HAIDUC	**1-2**	**512**	**98**	**18.05**	**2-3**	**1**	**2**	**509**
TF2	**1**	**499**	**128**	**16.05**	**3**	**1-2**	**3**	**531**

Stil variety comparative with Titan has a good wintering and pathogen attack resistance

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Wheat and triticale behavior on different fertilization levels

Wheat and triticale varieties	Average yield/ha		Differences (Kg/ha)
Winter wheat	Normal fertilization	Sub-optimum	
Apullum	4547	4317	-230
Gasparom	5138	4990	-148
Delabrad	4305	4131	-174
Glosa	4847	4083	-764
Gruia	4174	4044	-130
Litera	4829	3899	-930
Turda 2000	4574	4624	50
Triticale			
Titan	3761	3648	-113
Trilstar	3987	4016	29
Stil	3842	3362	-480

The behavior of spring two rows barley varieties and lines on comparative crops Braşov, 2007-2010

Variety (line)	Rising plants /sqm	Ears no. /sqm	Earing up data	Height (cm)	Pathogen attack resistance:				Yield . 14% U (kg /ha)
					Brown rust	Septor.	Pătarea reticulară	Fusari.	
TURDEANA	494	688	5.06	79	1	3	3	2	2623
DACIANA	491	840	7.06	77	1	3	2-3	2	2236
JUBILEU	496	755	3.06	71	2	3-4	2-3	2-3	2573
ROMANITA	502	781	8.06	77	1-2	2-3	4	2	2584
MARIA	505	835	10.06	71	2	4	3-4	3	2435
TO-2172-01	508	827	7.06	71	1	3-4	3	2-3	3159
TO-2168-01	498	803	8.06	68	2	2-3	3	2	2502
TO-2131-00	490	802	4.06	81	2	3	4	2	2629

Parameters proposed for cereal seed production
Wheat, triticale, two-rows barley

Crop, varieties	Yield capacity (to/ha)	Mass hl (kg/hl)	Contain (%) of		Non-nitrogen extractive
			Gluten	Protein	
Wheat- Ardeal, Glosa, Litera	4 - 6	> 78	25 - 35	ridicat	-
Triticale- Titan si Stil	5 - 7	> 70	-	12 - 13	78 - 80%
Spring two-rows barley Daciana	4 - 5	-	-	< 11,5	-

- varieties with drought resistance:
  - Wheat: Glosa, Litera, Dumbrava , Turda 2000, Ardeal
  - Triticale: Plai, Trilstar, Haiduc, Stil, Titan.
- varieties which tolerates low nitrogen rates:
  - Wheat: Turda 2000, Gasparom, Delabrad, Apullum, Gruia
  - Triticale: Trilstar, Titan

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Cooperation of NIRDPSB Braşov 2007- 2011

INCDA Fundulea – project collaboration, biological material, scientific communications of results
SCDA Turda –biological material, scientific communications of results
SCDA Suceava -biological material, scientific communications of results

Beneficiaries:
- NIRDPSB development sector
- **Romanian and from abroad farmers, wheat producers, triticale and two-rows barley**

Disemination
- scientific sessions
- MADR, INCDA Fundulea, Braşov-sites
- specialized reviews
- booklet

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MEDICINAL AND AROMATIC PLANTS

General objective:

Keeping up bio-diversity on medicinal and aromatic plants world through:
-preservation and enrichment genetic resources collection
-seed production from high biological categories representative for mountain and hill zones species.

Activities:

• Keeping up existing genetic stock of medicinal plants characteristic for hill and mountain zones;
• Producing breeding material (vegetative and germinative) to extend surfaces with medicinal and aromatic plants.
• Finding technical solutions to assure profitableness of medicinal and aromatic plants crops.
• Promotion of medicinal plants as a solutions for soils, favourable flora and fauna reestablishment and rehabilitation.

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Medicinal and aromatic plants collection contains:

-160 annual, bi-annual and perennial species, varieties, populations from native and foreign sources, organized on plots after botanical classification.

- Echinacaea purpurarea
- Leuzea carthamoides
- Valeriana officinalis
- Rheum officinale
- Salvia officinalis

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Project Nr: 2619/2006 – Identification of new resources with intern and international competitive potential on durable development and bio-diversity preservation, through utilization of valuable genotypes of *Gentiana lutea* L. from tissue culture.

Objectives

Identification of:

- spreading area

- soils influences on plants growth

- identification and investigation of genotypes and their behaviour in experimental field transplantations conditions.

- monitor the new plants from experimental plots.

- getting *in vitro* plants and acclimatization on experimental plots in order to elaborate an unconventional multiplication protocol.

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Results:

-Monitor:

- physiological processes of the studied samples and their behaviour on breeding program,

- influence of new applications on plants rising and growing

Mapping samples from Postavaru mountains, soil needs for G*entiana lutea*, and morpho-physiological characteristics of samples found on this zone.

Taking into account biological and morpho-physiological characteristics of the species and its environmental needs, it is difficult to establish if the experimental results could to be applied to the farmers, because G*entiana* remains a specie with great demand versus soil and temperature. It growths better on natural habitat.

Conclusions

With some economically efficiency could be done its monitor on a restricted area, protected, in spreading natural habitat. After the experimental results we concluded that *Gentiana lutea* could not be cultivated, and *in vitro* multiplication method is suitable for research activities in controlled conditions only.

For protection of specie we recommend other species (G*entiana asclepiadaea),* as bitterness sources for therapy.

Project Nr.42-5/2006

Researches on development of modern technical applications for growing valuable aromatic and medicinal species to processing and utilization.

Objectives:

- **technological aspects of medicinal plants germination and cultivation**
- **drowing up cropping specific technologies in concordance with project general objectives.**
- **setting up experimental crops for: *Echinacea purpuraea, Salvia officinalis, Melissa officinalis,Trigonella foenumgraecum, Angelica archangelica.***
- **setting up locations and implementation of agricultural practices from specific technology, concerning crop maintenance and harvest of medicinal plants.**
- **presentation of technological solutions on demo fields**

Results:

- **technologies for whole medicinal plants species from project plan**
- **demonstrations of proposed solutions on demo fields.**

The results has direct and immediate applicability on private specialized farms on medicinal and aromatic crops, as well as on group farms level.

Main objectives for the future:

Profound thoroughgoing studies:

- **new technological sequences for cropping and integrated pests and diseases control to improve yield and quality of potatoes, sugar beet, cereals and medicinal plants.**

- **technological sequences for new potato varieties to increase marketable yield, cooking qualities and processing output.**

- **pests and diseases control on ecological rotations**

- **monitor potato crop health and development in connection with climate changes.**

- **monitor insect populations (aphids) with suction trap and joined to the database created under the auspices of the EU Thematic network EXAMINE**

- **extension of fundamental and applied researches on insect population dynamics and ecology**

- **monitor, forecasting and control of phyto-sanitary potato quarantine pest and diseases.**

- **innovative technologies to reduce potato and sugar beet agro-ecosystem vulnerability given to reemerging pests and disease and control possibility.**

- **researchers on remote sensing (satellite information) for monitor soil and water resources, potato health and vegetation state, nitrogen supplies for increasing precision agriculture efficiency.**

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