



MINISTERUL AGRICULTURII ȘI DEZVOLTĂRII RURALE

Academia de Științe Agricole și Silvicultură „Gheorghe Ionescu Sișești”

**INSTITUTUL NAȚIONAL DE CERCETARE-DEZVOLTARE
PENTRU BIOTEHNOLOGII ÎN HORTICULTURĂ ȘTEFĂNEȘTI ARGES**

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Nr. 3408 / 14.12.2011

INSTITUTIONAL DEVELOPMENT PLAN

The National Research and Development Institute

for Biotechnologies in Horticulture

Ștefănești - Argeș

2011

SUMMARY

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1.1 Scientific SWOT analysis

In this section is presented information on the strengths, weaknesses, opportunities, and threats related to the main activities performed within the NRDIBH Stefanesti. Strengths and also weaknesses are the results of the present organization and functional structure. The opportunities and threats are directly correlated with the present economical situation in the field of horticultural crops.

Strengths

- The experience gained by the research teams of the institute over the two decades of activity in the areas of basic and applied research, including the interdisciplinary research
- The existence of a large range of laboratory equipments and facilities, allowing various approaches in the field of horticultural biotechnology
- The high qualification of the young researchers and their commitment and dedication for the research work in biotechnology
- Availability of labs and infrastructure to an (at least) acceptable level
- The strong relationships with specialists in biotechnology from universities and other research centers, as potential partners in research projects
- The institutional capacity of the NRDIBH to realize the technological transfer
- Access to the scientific databases
- Access to the modern communication technologies.

Weaknesses

- Inadequate financial resources, resulting in the impossibility to adopt an efficient research management plan
- Insufficient diversity of scientific specialties, directly correlated to financial support and staff policy of the government for budgetary institutions
- Difficulty of employing technical personnel due to the government policies, laws and procedures
- Lack of private sector grants for research activity
- Poor participation of researchers in joint research programs with other researchers from similar institutions

- The present system of regulations regarding researcher promotion, which is not a stimulating one
- Slow adaptation to global requirements and changing research priorities, visions, and directions
- Lack of incentives for the obtained results through research activities
- Lack of funds dedicated to scholarships

Opportunities

- The increased interest showed in recent years by both private and state companies for the existing grapevine germplasm preserved at the NRDIBH, mainly for the *initial* and *base* high quality, unique, grapevine planting material. The main beneficiaries for this guaranteed quality planting material are the grapevine nurseries from our country
- The process for obtaining a such material/product involves the whole range of activities, including applied biotechnologies for the *in vitro* culture and thermo / chemo / electro therapy, virology tests, tests on morphological indicators, genetic analysis, and technological aspects for producing and maintenance this planting material. The planting material provided by the NRDIBH is fully guaranteed from the cultivar authenticity point of view, and certified for its totally healthy status as well. This is also essential for allowing the export of planting material (scions and rootstocks), both from worldwide cultivated varieties and the highly valuable Romanian table and wine grapevine cultivars.
- The high interest of many companies for either methods of propagating clonally *in vitro* large quantities of ornamental and medicinal plants, or for the resulting products of these methods - which can be exploited at best by the NRDIBH, where both technological capacities and research human potential are available.
- The possibility of attracting national investment in biotechnology, especially for grapevine resources and for pharmaceutical products obtained from ornamental or medicinal plants
- The possibility of attracting external human resources with partial working program to apply new technologies and obtain new demanded products

- Incentives to develop lower cost technologies
- The opportunity of participating to the national policy for science and technology which includes technical strategic programs
- The real need of private farmers and horticultural producers for receiving scientific advices and services.

Threats

- Biotechnology inputs and technical activities are often expensive
- Difficulties in transferring technologies and biotechnology results towards the final beneficiars
- Lack of initial funding for base salary.
- Biotechnology field is not yet considered a priority in the private sector.
- Limited possibilities to participate in international competition for qualified experts in biotechnology.
- Lack of motivation to perform research activities in the field of biotechnology
- Time needed to develop some biotechnology products is long.

1.2. Strategic scientific objectives and directions

This plan outlines a strategy for applied biotechnology on horticultural crops, answering to the national policy and taking into consideration the actual scientific possibilities and current research capabilities.

The research activity within the Institute will have the following main directions:

- ⇒ genetic improvement of horticultural plants, by using biotechnology and molecular biology methods;
- ⇒ average and long term preservation of germplasm for some of the most important horticultural plants;
- ⇒ turning to economic account the germplasm, by identifying valuable genotypes and multiplying them aiming to obtain various bioactive compounds for the food industry, the pharmaceutical and cosmetics industry;
- ⇒ utilization of the biotechnological methods to obtain food, pharmaceutical and cosmetic products derived from horticultural crops.

These activities will be carried out within the four departments, each endowed with appropriately equipped laboratories, having specific goals, and aiming at obtaining useful biological products. For each department the following specific research directions have been established:

Applied Biotechnology

No.	Objectives	Target
1	Obtaining plant material from some horticultural species by using <i>in vitro</i> micropropagation techniques, especially for those difficult to multiply by conventional methods;	<ul style="list-style-type: none"> - efficient <i>in vitro</i> methods to obtain stable cultures on (at least) 5 species of medicinal plant - develop tissue culture protocols for (at least) 5 species of ornamental plant - establishment of cell lines capable of producing high yields of secondary compounds in cell suspension
2	Obtaining plant material guaranteed for its healthy status, free of the main virus diseases, through thermotherapy and / or <i>in vitro</i> culture, chemo- and electrotherapy;	- assessment of plants derived from tissue fragments during <i>in vitro</i> culture, accommodation to ex vitro environment and regeneration of healthy plants on (at least) 20 genotypes
3	Establishing and optimizing the methods for <i>in vitro</i> preservation of the plant germplasm, on average and long term storage;	- <i>in vitro</i> medium- term conservation on media with low mineral nutrient and a low sucrose concentration on (at least) 10 genotypes
4	Isolation, identification and multiplication of pure bacterial strains, as well as their use for the enhancement of efficiency in wine-making.	<ul style="list-style-type: none"> - establish the pure cultures with bacteria strains; - morphological, cytological and biochemical characterization on bacterial cultures

Genetics, Molecular Biology, Plant Breeding

No.	Objectives	Target
1	Breeding methods applied in grapevines to create new cultivars / clones accumulating both resistance to pathogens and adaptation to climatic changes	<ul style="list-style-type: none"> - cross breeding and clonal selection are used to obtain new genotypes – at least 10 accessions - apply for approval at least 1 cultivar and 3 selections
2	Knowledge of grapevine genetic diversity	- genetic diversity evaluation on grapevine genetic resources – 50 accessions
3	Genetic diversity characterization of Romanian cultivars by molecular markers	- Two molecular markers systems: RAPD and SSR used for identification, genetic diversity and stability analysis

		of 20 autochthonous Romanian grapevine varieties.
	Identification, collection and preservation of <i>Vitis vinifera subsp. sylvestris</i> existing in wilderness	-9 different wild grapevines genotypes vegetative multiplied, established <i>in vitro</i> cultures and characterized by OIV descriptors and molecular methods
	Inventory of <i>Vitis</i> genetic resources in Romania - Recording these accessions in the European <i>Vitis</i> Database.	- the present state of vineyards with Romanian native grapevine cultivars; - autochthonous cultivars inventory from the national grapevine collections; - list of autochthonous clones recommended to set up vineyards; - identification of old indigenous varieties or neglected and subject to continuing eradication.

Agrotechnology and Plant Protection

No.	Objectives	Targets
1	Analysis of interactions between pathogenic agents / pests and plants	- identifying the specific mechanisms of recognition, penetration, colonization, parasitism and/or multiplication of pathogens in plants - molecular methods applied for virus detection in plants - particular plant traits in interactions with plant pathogens
	Study and characterization of pathogenic populations and pests having a high potentiality of damaging cultivated plants	- the correlations between the main pathogen diversity and biological control applied to horticultural crops, - assessment of pathogen-plant interaction as response to different management practices - identifying novel strains of pathogens and their mechanisms of action
	Obtaining ecologic / organic crops by using several management technologies based on conventional and non-polluting methods;	- using microbial species (bacteria and fungi) and their metabolic products as bio-pesticides (bio-insecticides, bio-fungicides, bio-herbicides); - combining the conventional and the ecological methods for weeds control in the horticultural exploitations
	New phyto-sanitary technologies applied on horticultural crops	- reduction to a minimum number the chemical treatments, and their replacement with extra-radicular fertilization

Biochemistry and Plant Physiology

No.	Objectives	Target
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1	biochemical methods applied for the detection and selection of plants with higher tolerance or resistance to biotic and abiotic stresses;	- increased efficiency of the applied methods; - comparative tests on economically important crops and mode plants
5	evaluation of quality and quantity of chemical and biochemical components in plants and in their derived products	- production of secondary metabolites using plants as bioreactors; - extraction and purification of biologically active compounds and secondary metabolites from (at least) three medicinal plant species

Permanent priorities for short and long term in research and development activities. When choosing the research themes, the following issues will have to be emphasized:

- identifying, characterizing and efficiently turning to account the native horticultural germplasm;
- the needs and requirements of the national and foreign market, by trying to harmonize and link such factors as: social command – research supply – testing the products by the consumer – monitoring the consumer’s preferences – the new command to research;
- satisfying the market demands and comply with quality control requirements and safety insurance;
- the results of the research are disseminated, by means of the activity of information and communication, in order to attract the potential beneficiaries, of the interest groups, so as to enable the researchers to turn to account their results subsequently. The favourable response to the demands of the consumers in certain domains of activity constitutes one of the significant conditions for attracting private investors in the field of applied research.

1.3. The human resources strategy

The quality of human resources is an essential aspect ensuring success in research and development activities. The shortage of highly competent and skilled people, including both researchers and technical managers and leaders, could limit the improvement of achievements of NRDIBH. The plan for the next years regarding human resources strategy covers the following aspects:

- a) hiring with part-time activities researchers from other research institutions working in the same field, or connected fields, specialists preparing their PhD thesis, young university graduates attending post-graduate studies, teaching staff;
- b) ensuring the wage costs, for the research work within the different research programmes, at different values, in accordance with the complexity of the activity involved, with the ability to use the laboratory equipment and devices, as well as depending on the quality and impact of the obtained results;
- c) approving and supporting the attendance to training courses aiming to develop understanding and skills for different positions, such as: biotechnology activities, project manager, general competence for strategy design, financial management, trading management, foreign languages;
- d) improving the present situation and to encourage the international collaboration to research projects and to take on specialists from other countries;
- e) increasing the number of young specialist, or recently graduated for biotechnology domain as (is) a priority;
- f) giving priority to those who have previous experience in a biotechnology laboratory and who continue to meet criteria for employment: professional competence and efficiency of proposed solutions.

1.4. Mechanisms for stimulating the appearance of new research directions

The research department has the main duty to apply for research projects within the national and international competitions. A variety of projects with different goals and objectives will be included in the NRDIBH program of activities. Depending

on the number of approved projects for financing, the human and technological capacities, this internal program will take into consideration the following:

- balance across objectives of approved projects, and the possible success in the future competitions of the unsuccessful applications;
- a good balance between projects aiming at immediate or short term impact and those which can have a strong impact over a far or extended period of time;
- development of the vision, mission, and strategic objectives by cooperation with a large number of stakeholders, including many biotechnology experts;
- providing settings that encourage creativity and investment in the field of biotechnology;
- orienting the applications of biotechnology towards achievement of healthy and safety products;
- protecting the biodiversity resources through the development of appropriate biotechnology applications;
- strengthening the relationship between the biotechnology programs and society demands.

1.5. Financial SWOT analysis

National Institute for Biotechnology Research and Development in Horticulture Stefanesti-Arges operates in accordance with nr.2113/24.11.2004 Government on the establishment, organization and functioning of the National Institute of Research - Development of Biotechnology in Horticulture Stefanesti - Arges by reorganizing resort Wine Research and Production Stefanesti - Arges, according to Law 290/2002 on the organization and functioning of research and development of agriculture, forestry, food industry and ASAS "Gheorghe Ionescu Sisesti" as amended by EO nr.29/14.04 .2005, as well as legal acts regulating activities in the field.

The main activity is the development in biotechnology research CAEN code 7311, and the secondary objects of activity include 0121-Grape Production, 1102 - Manufacture of wine from grapes, 0111 - Production and marketing of propagating

material.

The Institute is registered in Arges Trade Register under no. J03/1232/2005, Unique Registration Code 2522213 owns, fiscal attribute RO - are registered for VAT purposes.

Ownership: The Institute is a state owned entity, classified as "other economic units in the unprocessed state or autonomous companies' code 13, as decided by the reorganization no. 2113/2004, is based on economic management and financial autonomy, calculates and manages the accounts amortizmente economic region.

Headquarters of the Institute: Arges Stefanesti City, Street Road Pitesti - Bucharest no. 37. Stefanesti vineyard wines - Arges have won numerous awards at national and international competitions. Both young and old wines Stefanesti brought many medals at various national and international competitions of the most demanding, have won, not once, resulting in more and diploma champion.

Assessments and special interest generosity and perseverance shown by consumers in country table wines Stefanesti satisfy producers. Laudatory assessments collected documents that pervades throughout history, is a recognition of the nobility and high generosity of these lands, and the effort and passion of those who worked and work with wine in the vineyard and winery.

National Institute for Biotechnology Research and Development in Horticulture Stefanesti - Arges, is taken over and furthers these beautiful and inspiring traditions, objective research and even more during this period viticulture and Arges and not only records a period of decline. From approximately 4000 ha plantation operated with vines of which 1500 ha of the year 1990 Stefanesti resort still found today less than 300 ha in expootatii viable. Private sector receive restitution vineyards, he abandoned this sector today so add 100 ha plantation holdings.

Currently, the area under the administration of the institute is 423.39 ha, according to Law 72/2011 Annex 2.1. Capital is 6.900.224lei, of which:

-Subscribed and paid up: 159.806lei

- Heritage Administration: 6.740.418lei

In addition to research their work, N.I.B.R.D.H. has an area of approx. 150 hectares of vines that the complex processes in their own wine.

Products

- Bottled Wine Feteasca Regala
 - Bottled Wine Feteasca Neagra
 - Bottled Wine Suvignon
 - Bottled Wine Riesling
 - Bottled Wine Cabernet Sauvignon
- 1968-2004 collection wines, wines that have won various awards at national and international competitions.

Services:

- Analysis of the virology laboratory for testing the vines (RENAR accredited laboratory)
- Laboratory tests for determination of Genetically Modified Organisms (Lab RENAR)
- Chemical and organoleptic analysis of wine and spirits (Laboratory RENAR)
- Consulting biotechnology, viticulture, wine- Services for wine grapes and wine storage for private producers in the tax warehouse-complex wine N.I.B.R.D.H. Stefanesti

Strengths:

- Brand market Stefanesti regained in the last three years, following the reorganization of management, sales revenue is growing, estimating for 2011 an increase of 20% from 2010.
- Continuing investment in all sectors, departments and divisions necessary for modern enterprises, the total investments made in 2011 to over 44.870 euros.
- The department of research, technology and modern equipment that is equipped, it can effectively and rigorous quality control products, which is a constant, providing services and institutes / stations in the country and private partners interested in this, with analysis performed by three laboratories Renar.

- The team of specialists at all levels: researchers, engineers, technicians, growers, winemakers, combining theoretical and practical knowledge.

- Refocusing the human resource evaluation system to boost efficiency

- Image Institute is supported primarily by the quality of products and services market, but also a marketing strategy aligned with market economy requirements.

- Action Stefanesti-Arges brand promotion began in 2009, but began to materialize in the years 2010-2011, when it was changed the presentation of products in terms of glass, labels, corks, capsules, etc.. (Actually imposed in the first place where most wine market is held by private producatoriii) was implemented a rigorous quality control system, the was purchased wine bottling line fully automatic, three filters were purchased for filtering wine: stainless Kieselguhr filter, filter with plates and sterile filter.

- Institute through its products and their prices attractive, has a favorable image in the market growing in 2011, exceeding the established private manufactors: Recas Winery, Tohani Winery, Murfatlar Winery.

- 2011 financial year results, along with payment of debts to the state budget and infrastructure owned by our institute, offers the possibility of accessing European funds since 2012, both for the research and development sector, including reconvesia vine plantations, whereas in recent years this sector has grown considerably.

Weaknesses:

- National research system is not aimed at supporting and implementing research results into production.

- Lack of well established legal framework in which virological tests and determinations concerning GMOs, limits contracting of services to make our analysis by laboratories accredited Renar, whose maintenance is quite expensive.

- Funding sources limited their evolution in an unstable economy, a wine market where the private sector leads, setting up their own rules to promote its products more or less correct, in which competitive practices.

- If the research has efficient equipment, modern development in the sector and implementation of research results required major investments, both in the category capital repair and endowments category (tractors, machinery and equipment for maintenance of plantations).

- Underdeveloped distribution infrastructure;

OPPORTUNITIES:

- Regaining Pite, determined primarily by the quality products offered in relation to price, and those in contracts concluded under negotiation with foreign partners, provides premises sales growth in 2012 with at least 30%, to promote both wine Stefanesti Bucharest market and European market.

- Promorarea Argessis brandy made from distilled wine aged for at least 25 years, "treasure" institutului, as it was called the cunscatori, absent from the market in the last 10-15 years, offers the premise of restoring financial balance.

- Investments in plantation of vines by private investors, offering the possibility of concluding new contracts for both the analysis of biological material before planting grapes for vinification and wine storage in our complex wine, but analyzes the wine in the laboratory wine chemistry.

- Negotiation of collaboration in terms of planting material, N.I.B.R.D.H. Stefanesti as unique germplasm maintenance of vineyards, is the starting point for planting material quality, free of viruses, this market segment is highly appreciated by Romanian and foreign investors.

- N.I.B.R.D.H. the potential and the potential area that is located has the possibility of vertical integration and diversification.

THREATS:

- The legislative framework in Romania is a major threat to the Romanian economy as a whole, regardless of ownership or funding source, fiscal instability, bureaucracy, legal framework and interpreted very dense compared to other European countries.

- Increasing pressure growing competition - imported wines, of poor quality, but strongly promoted and presented in attractive packaging

- Abusive restitution of land which are vine plantations.

- Alternate dry and wet years, cold winters and hot, rainy summers, effects on grape crops;
- Policies to reduce and eliminate alcohol consumption.

CONCLUSIONS

To maintain and develop increased N.I.B.R.D.H. Stefanesti can be act by:

- Further upgrading the technical and material;
- Development of sales and selling products directly to customers;
- Development of nomenclature of products and services;
- Production and marketing of raw materials or semi for other companies;
- Human resource rejuvenation by attracting young specialists both in research and development (researchers, engineers);

Following analysis of conclusions to senior management of the institute can be made:

- Redefining the mission, strategic directions and development objectives
- Hierarchy of development objectives;
- Development measures and the indicators to achieve development.

SWOT analysis is an effective method, used for identifying potential strategic planning, priorities and creating a shared vision of achieving development strategy. SWOT analysis actually have to answer the question "Where are we?", It involves analysis of the company's internal environment and external environment generally and specifically.

SWOT analysis gives the opportunity to identify appropriate measures for removing / reducing weaknesses (their hierarchy of the priority) and largely eliminate threats surprise for planting material quality, free of viruses, this market segment is highly appreciated by Romanian and foreign investors.

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1.6. Infrastructure: investment plan and strategy

Middle -term investment plan established some general priorities for the coming four years and describes its implementation of measures necessary technical and financial terms. The plan includes a list of investment planned to run during this period. Order to develop such a plan is to improve the implementation of annual investment of investments, concentration of financial resources according to priority investments so as to ensure a quick completion thereof, and lower implementation costs. The plan, by its nature, is truly the "rotation", that is improved by regular updating of the information plan for the budget years by increasing the role and tasks for the next period. Investment plan medium and long term investments for which the insured presents financing in the following time periods established in the fields, along with methods of financing.

Since both in development work and in research emphasis is on efficiency, profitability, reduce losses and increase the results of the investment strategy has mainly N.I.R. D.B.H Stefanesti following objectives:

1. Creating a suitable environment for employees working in the obtain a high degree of profitability as work;
2. Reducing costs, that upgrading technologies and equipments.
3. Stimulation to increase sales turnover, financial performance.
4. In order to achieve objectives, the following investment are required

No. crt.	Name	Estimated value euro
1.	Rehabilitation and modernization of the building complex research - Fitotron with laboratories	€300.000
2.	Planning protected areas to create appropriate conditions to maintain the original material wine	€ 50.000
3.	Purchase of laboratory equipment and accessories for research equipment. Funds provided by ongoing research projects	€ 30.000
4.	The objectives of the proposed investment on equipment and modernization of the Ministry of Agriculture laboratories	€50.000
5.	Modernizing and equipping the space station microvinificatie varieties and clones in experimental fields, checking parcels and conservation of biological materialului wine	€50.000

6.	Creating the necessary conditions for producing the material quality wine, by acquiring a controlled growth rooms	€ 50.000
7.	Facilities and infrastructure development sector	€ 170.000
	Modernization and operational capacity to organize	€ 50.000
	Provision of equipment and machinery	€ 120.000
8.	Increased visibility of research capacity by modernizing and equipping the presentation of research results and extension of producer groups, large and small farmers	€ 20.000
9.	Micro distillation to obtain alcohol-based products obtained from waste dinprodusele vinification: pomace, grape yeast,	€ 100.000
10.	Conversion of 30 hectares of plantation life living	€ 300.000
		€ 1.120.000

Development strategy for the next four years N.I.R.B.H. Stefanesti, is closely related to the investment plan, with funding sources:

- Revenues,
- Grants obtained from A.S.A.S. through the Ministry of Agriculture, under Law 72/2011,
- Investment projects grants
- Research contracts, ongoing or future.

1.7. Technology transfer and the attraction of non-public funds.

- In the near future we will have to pay more attention than in the past to access external funding, especially for transferring technologies resulted from the applied biotechnology researches;
- The present clients who are using the results obtained in the institute (produces, methods – technologies, or services) and are satisfied with these results represent the first priority for maintenance collaboration ship. All these clients represent important beneficiaries and also an important category of partners to turn attention of potentially new clients for research activities;
- Research and Development departments can rally present clients (farmers, research institutions) and together to lobby for their special interests. In turn, the private beneficiaries can join forces with other horticultural interests and attract new funds

1.8. Strategic partnerships and visibility

- We will seek to obtain more funds through the Open Competition procedure and by writing proposals for specific programmes;
- sustaining research partnerships with other universities, business, government and non-government organisations in Romania and EU;
- Collaboration with other scientific partners is necessary for the funding of joint projects. We will continue to look for and meet opportunities for co-financing the research projects with the main beneficiaries of our results;
- Maintenance and improvement the present partnership contract signed with universities from Pitesti, UASVM from Bucharest, Cluj Napoca and Iasi, as well as research institute having similar research objectives;
- Increasing research results visibility by partners offering their financial support for seminars, conferences, or workshops;
- EU programmes on biotechnology or related domain will have our special attention. We will focus on the new programme by preparing at least one proposal every two years;
- We continue to find partners for joint projects and try to be involved as coordinator in this research programmes. For every call we will participate in at least two proposals;
- These collaborative projects will strengthen international networks and led to a significant number of publications in international journals, reports, or books, in English language.