



Rural Development Administration



Structure and Research

Republic of Korea

June, 2013



RDA – Rural Development Administration

The Rural Development Administration (RDA) is the central government organization responsible for extensive agricultural research and services in Korea.

The RDA's efforts are directed towards highly competitive agriculture and efficient rural development. It endeavors to support farmers to produce agricultural commodities with better quality; advancing low-input, labor-saving and environment-friendly cropping technologies; promoting modern and automated production facilities; and nurturing future farmers.

The National Agenda for Agricultural R&D include future high-technology, On-Farm Technology and Agro-food technologies.



Future High-Technology

- Development of Bio-materials Using Agro-biotechnology;
- Development of Value-added Products Using Diverse Agro-biological Resources;
- Industrialization and Technology Development Using Beneficial Insects and Green Landscape;
- Development of Automated Plant & Animal Production System;
- Development of the Future Agricultural Techniques Corresponding Climate Change.



[On-Farm Technology](#)

- *Development of Stable Crop Production Technologies;*
- *Technology Development for FTA-associated Agro-livestock Production;*
- *Technology Development for Forage Production;*
- *Development of Domestic Varieties for Reduction of Foreign Royalty;*
- *Development of Technologies for Substitution of Agro-chemicals;*
- *Technology Development for Resource-recycling Organic Agriculture;*
- *Development of Environment-friendly Energy-saving Technologies and Alternative Bioenergy.*



[Agro-Food Technologies](#)

- *Development of Agro-food Safety Management Technologies;*
- *Development of Value-added/New Functional Agro-foods;*
- *Globalization of Korean Foods and Industrialization of Traditional Foods.*



The RDA's structure of research, development and technology transfer is composed of the following institutes:



National Institutes

- [National Institute of Animal Science \(NIAS\)](#)
- [National Institute of Horticultural & Herbal Science \(NIHHS\)](#)
- [National Institute of Crop Science \(NICS\)](#)
- [National Academy of Agricultural Science \(NAAS\)](#)



National Institute of Animal Science **(NIAS)**

The researches carried out by the Institute are as based on the RDA priority agenda. In 2010, it was carried out a total of 321 research projects, which resulted in 105 Political Proposals and 183 On-farm applications adopted and applied to national organizations and industrial fields. In addition, the Institute has presented various achievements of a total of 178 cases of industrial patents and technology transfers for industrialization, a total of 172 research article publications (including 69 articles in SCI level), and a total of 321 research presentations.

The Institute is organized in three branches, Department of Biotechnology & Environmental (Animal Biotechnology Division, Animal Genomic and Bioinformatics Division, Animal Products Research and Development Division, Animal Environment Division and Animal Nutrition and Physiology Team), Department of Animal Researches Development (Animal Breeding and Genetic Division, Dairy Science Division, Swine Science Division, Poultry Science Division and Grassland & Forage Crops Division) and Experimental (Hanwoo Experiment Station, Animal Genetic Resources Station and Subtropical Animal Experiment Station).

The researchers are concentrated on five categories, being: Establishment of competitive livestock system in response to FTA; Sustainable low carbon green livestock; Production of high quality and safe animal products and Construction of future livestock platform as a bio-industry.



Establishment of competitive livestock system in response to FTA

- Management of integrated genetic resources based on nationwide breeding schemes;
- Production of high quality Hanwoo (Korean native cattle);
- Development of stable breeding system for high performing dairy cattle;
- Improvement of breeder pigs for quality meat;
- Refinement and advancement of poultry industry;
- Recycling of agricultural by-products to reduce feeding cost;
- Providing field technical support for advanced livestock farm.



Sustainable low carbon green livestock

- [Design of natural circulation system for treatment and recycling livestock manure;](#)
- [Development of new varieties and forage crops cultivation technology;](#)
- [Development of livestock technology in response to climate change;](#)
- [Development of energy-saving green livestock technology.](#)



Production of high quality and safe animal products

- [Technological development and differentiating strategy for high quality animal products;](#)
- [Safety control technology for animal products;](#)
- [Development of enhanced functional animal foods](#)



Construction of future livestock platform as a bio-industry

- [Transgenic application in animals: Development of high-value new materials and commercialization;](#)
- [Assessment of animal genomic study and their generic resource conservation;](#)
- [Advancement of the livestock industry and establishment of different animal welfare models;](#)
- [Establishment of platform for research on rearing animal companions](#)



The major results obtained in 2010 and 2011 are presented below. To access the PDF file, define the area of interest and click on the desired year.



Annual Reports

Biotechnology Research – [\(2011\)/\(2010\)](#)

Animal Genomics & Bioinformatics – [\(2011\)/\(2010\)](#)

Animal Products Research – [\(2011\)/\(2010\)](#)

Livestock Environment Research – [\(2011\)/\(2010\)](#)

Nutrition and Physiology Research – [\(2011\)/\(2010\)](#)

Animal Genetic Improvement Research – [\(2011\)/\(2010\)](#)

Dairy Cattle Research – [\(2011\)/\(2010\)](#)

Swine Research – [\(2011\)/\(2010\)](#)

Poultry Research – [\(2011\)/\(2010\)](#)

Grassland and Forage Research – [\(2011\)/\(2010\)](#)

Hanwoo Research – [\(2011\)/H\(2010\)](#)

Animal Genetics and Resources Research – [\(2011\)/\(2010\)](#)

Subtropical Livestock Research – [\(2011\)/\(2010\)](#)



National Academy of Agricultural Science (NAAS)

NAAS under RDA consists of 6 departments and 1 center, with 508 staff and serves for various research & development undertakings all over the country, guided by the national agricultural directions.

The role of NAAS is described below:

- Generation of new income by applying rural resources and maintaining a healthy agricultural ecosystem;
- Crop protection and technical development on practical use of biological resources;
- Development of production techniques for safe agricultural products;
- Automation (robotics) of farm production and development of post-harvest technologies;
- Securing fundamental techniques and practical use in agricultural biotechnology
- Development of commercialization techniques for globalization of agricultural and Korean food;
- Management and use of national agricultural genetic resources.

Department of Agricultural Environment

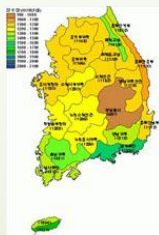
The Department of Agricultural Environment is a national research organization supporting rural area to maintain sound agricultural environment through developing rural resources and new agricultural technologies. This Department carries out the research for a healthy environment for agricultural production, and preserving the national land protecting its environment such as technology development for renewable bio-energy production, a countermeasure for climate change.

It consists of Soil & Fertilizer Management Division, and Climate Change & Agro-Ecology Division and Organic Agriculture Division and Rural Environment & Resources Division.



Soil & Fertilizer Management Division

- Reclassification of Inceptisols Corresponding to the International Soil Classification System;
- Mobile Web Version of the Soil Information System (<http://soil.rda.go.kr>);
- Estimation of soil organic carbon and crop status using remote sensing;
- Water-saving irrigation guidelines for upland crops;
- Soil chemistry and fertility management;
- Environment friendly fertilization management.



Climate Change & Agro-Ecology Division

- Establish highest level of organic farming system;
- Development of organic farming technology.



Rural Environment & Resource Division

- Rural Amenity Resource Survey and Space Planning Research;
- Excavation and Utilization of Rural Traditional Knowledge Resource;
- Improvement quality and diversification of rural tourism;
- Development of settlement support for reformers, rural in-migrants and multicultural family and welfare services of rural residents.



Department of Agricultural Biology

The Agricultural Biology Department consists of three divisions. The Sericultural & Apicultural Materials Division is in charge of promoting related industries by doing basic and applied researches to develop bioactive functional materials from mulberry, silkworm and honeybee. The Applied Entomology Division is responsible for the development of the industrial use of insects, including pollinators, scavengers and environment-friendly pet insects, and the packaging of teaching and other materials. The Agricultural Microbiology Division provides services for the evaluation of bio-rational formulations, management and classification of useful agricultural microorganisms including mushrooms, and development of methods for their application to sustainable agriculture.



Sericultural & Apicultural Materials Division

- Breeding of New Mulberry (*Morus alba* L.) Cultivar, Sangchon-ppong, for Fruit Production;
- Integrated Pest and Disease Management in Honeybee Hives;
- Biological Effects of Treatment of an Animal Skin Wound with Honeybee (*Apis mellifera* L.) Venom;
- Development of Novel Uses of Sericultural Products and Silk Protein;
- Development of Silkworm Biotechnology for Production of Useful Materials.



Applied Entomology Division

- Investigation and conservation of insects;
- Utilization of the Black Soldier Fly for High-tech Fusion-based Environment; Remediation and Development of High Value-added Substance;
- Effect of Foraging Activity of Pollinators and Productivity Increase of Major Agricultural Crops;
- Effects of the Synthetic Coprisin Analog Peptide, CopA3, in Pathogenic Microorganisms and Mammalian Cancer.



Agricultural Microbiology Division

- *Korean Agricultural Culture Collection (KACC);*
- *Mapping Soil Bacterial Communities of Paddy Soils in Korea;*
- *Research on Microorganisms for Pest Biological Control;*
- *Granulation of Beneficial Peptides and Identification of Secondary Metabolites from Bacillus sp.*

Department of Agro-food Safety

The department of Crop Life Safety at National Academy of Agricultural Science promotes technical development to support the production of safe agro-foods and fundamental research to achieve four main goals with the vision 'Construction of management foundation to produce safe agro-foods at the level of G7 developed countries'. The goals are: 1) establishment of risk assessment system for agro-foods based on scientific importance, 2) domestic consumption and export expansion by means of securing safety of agro-foods from farm to table, 3) construction of foundation of GAP system and distribution of practical model developed for each crop, and 4) development of Korean organic agricultural techniques and use in the field.

The department of Crop Life Safety consists of four divisions, Chemical Safety Division, Crop Protection Division, Agro-materials Safety Evaluation Division and Microbial Safety Team. Each division has its own task. Chemical Safety Division has research projects to construct synthetic management system of hazardous substances for safe agro-foods. The main goal of Crop Protection Division is development of plant protection technologies and entomological resources, and development of crop protection methods safe to human and ecosystems. Agro-materials Safety Evaluation Division is carrying out the evaluation of pesticide for registration and researches on the development of management system for pesticide safety. Microbial Safety Team is performing researches to distribute and expand GAP system and to reduce hazardous microbial organisms in agro-foods.

Department researches are centered on three main targets such as on-farm research, thorough customer management, the strengthening of public relations and so forth.



Chemical Safety Division

- Development of new multi-residue analysis methods for pesticides and organic pollutants;
- Establish the management protocol of organic pollutants;
- Introducing and distributing safe pesticide application manual for exporting agricultural products.



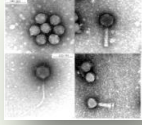
Crop Protection Division

- Diagnosis and Management of Crop Diseases;
- Development of population dynamic model and control tactics of agricultural insect pests;
- Virus disease;
- Weed Science;
- Natural Enemies of Insect pests Biocontrol of insect pests of hot pepper in greenhouse;
- Introduction of natural enemy of the Lanternfly.



Agro-Materials Safety Evaluation Division

- The quality management of pesticides & improvement of analysis method;
- The establishment of the test guidelines and the standards to assess the efficacy and phytotoxicity of pesticides;
- Setting of the pesticide safety standards and quality control of the pesticide analysis;
- Risk Assessment Advancement of Pesticides.



Microbial Safety Team

- Settlement of management system for agro-food safety including GAP;
- Reduction of mycotoxins in crops;
- Diagnosis and control of bacteria causing sitotoxism in fresh vegetables.

Department of Agricultural Engineering

The Department consists of 4 divisions and carries out 4 tasks such as the mechanization and automation technology in the agricultural production, energy saving technology for stable management of farm household, the postharvest technology for ameliorating value-added of agricultural products, and developing prevention technology for agricultural disasters.



Farming Automation Engineering Division

- Grafting robot for fruit vegetables;
- Vegetable transplanter;
- Salt elimination system from agricultural water.



Division of Energy & Environmental Engineering

- Development and distribution of horizontal geothermal hit pump system;
- Developing and distributing a ventilation device for heat recovery.



Post-Harvest & Food Engineering Division

- Developing a non-destructive fruit saccharinity grader;
- Developing cleansing machine for the distribution of safe-credible agricultural products;
- Developing the device of a high percentage of humidity & a low-temperature keeping.



Agricultural Safety Engineering Division

- Support policy on agricultural mechanization and technique development for safe application;
- Development of the multi-functional bank sheet around a rice field to prevent the bank's breakdown and save wedding cost;
- Alleviation of agricultural disasters and development of prevention techniques (<http://farmner.rda.go.kr>).

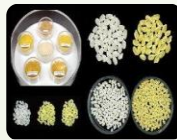
Department of Agriculture Biotechnology

This department has a national mission to create a new growth engine for future agriculture in the era of bioeconomy through the national R&D infrastructures for agricultural biotechnology. This national institution does focus on basic researches to expand the limits of agricultural techniques for better productivity and value creation for agriculture. The department consists of four divisions, Genomics, Metabolic Engineering, Molecular Breeding and Biosafety. The national core R&D infrastructure serves for the networking of national cooperative researches among its sibling research institutes, academic universities as well as private companies.



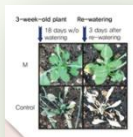
Genomics Division

- The analysis of a dielectric structure on cabbage;
- The analysis of dielectric structure and functional research on bacterial leaf blight;
- The research on a functional dielectric with rice-inserted mutant group.



Functional Bio-material Division

- The development of vitamin A-strengthened gold rice;
- Development of medical protein production skill by using plant system.



Bio-crop Development Division

- Development of stress-tolerant crops;
- Assay system of abiotic stress tolerance



Bio-safety Division

- Excavation of transformation crops feasible for practical use;
- The evaluation of the food from GM crop and environmental safety;
- The application of the educational program 'Know GMO straightforwardly'.



Department of Agro-food Resources

Department has 3 divisions and promotes fundamental and applied research & development for cultivating the agricultural and food industry to nation's new growth engine as a national organization. There are 3 goals. : first, the creation of value-added of agricultural food and construction of stable distributing system, second, the global commercialization of Korean cuisine, Hansik, and traditional foods, and the last, the settlement and spreading wholesome Korean diet patterns.

Fermented Food Science Division



- Screening and Resources of Useful Fermentation Microorganisms;
- Restoration and industrialization of Korean traditional liquor from ancient documents;
- Development of Makgeolli (Korean traditional liquor) in a new paradigm;
- Upgrading food components using excellent fermented microorganisms.

Functional Food & Nutrition Division



- Book Publication, "The composition table of the national food standard", for providing various nutritional information to the public;
- The research on functional evaluation for looking into healthy value on the resources of the nation's agricultural products;
- Creating new demand by the development of practical technique from high value-added food materials.

Agro-food Utilization Division



- The one and only "Not-harden Technology;
- Improving usability of the traditional food and assuring the international intellectual property of right;
- Investigation of benefit effect of han-sin on health



[National Agrobiodiversity Center](#)



National Agrobiodiversity Center carries out distributing genetic resources and its information to users including public and private sectors through collecting, preserving, regenerating and evaluating agricultural genetic resources.

Recently the National Agrobiodiversity Center is focusing on the collection to secure the diversity of agricultural genetic resources related to 'Low Carbon, Green Growth' and following up the international issues such as the access and benefit sharing, protection of intellectual property on agricultural genetic resources. Especially the National Agrobiodiversity Center is strengthening the international relations for genetic resources.

Four teams, as described below, are sharing the mission of 'Securing the diversity of agricultural genetic resources', 'Establishing the national management system', 'Securing sovereignty', 'Enhancing the utilization of genetic resources' and 'Serving as a northeast hub bank for genetic resources'.

[Agrobiodiversity Group](#)

[Planning & Information Team](#)

[Plant Genetic Resources Management Team](#)

[Plant Genetic Resources Evaluation Team](#)

[General Services Team](#)



National Institute of Horticultural & Herbal Science (NIHHS)

The National Institute of Horticultural & Herbal Science (NIHHS) is responsible for horticultural and herbal research and services in Korea. In Korea, the overall value of horticultural and herbal products accounts for about 50 to 60% of the total value of the agricultural products. In the biotechnological era of the 21st century, Korea has become one of the most developed countries in the area of horticultural and herbal science and technology.

Horticulture and herbal plays an important role for the production of safe and healthy food for the people, maintaining clear water, and securing sustainable land for the future. Since 1970s, NIHHS did a leading role in achieving the “White Revolution”, which allowed opulent and the year-round production of horticultural crops under the plastic culture. For these reasons, NIHHS is regarded as the Mecca of various horticultural technologies.

The NIHHS' research has being developed in the following fields:

Vegetables Research



Breeding of high-quality and disease-resistant cultivars using advanced breeding technology

- Developing safe and functional vegetable cultivars for chinese cabbage, radish, pepper, tomato, strawberry, lettuce, garlic, and watermelon
- The leading cultivars: the world first crossbred garlic cultivar, 'hawsan' and export oriented strawberry, 'suqyeong'



Production of cost saving and year-round production technology

- Developing integrated transplant production systems to supply year-round high-quality vegetable seedlings;
- Garlic bulbil cultivation technique to reduce the production cost;
- Focusing on the reduction of replant failure of major vegetables in protected horticulture;
- Building up high-quality and safe production systems for stable supply of fresh vegetables.



Plant factory for future driving

- Developing a container-type plant factory designed to tolerate below -40 °C for the supply of fresh vegetables to antarctic 'king sejong station';
- Developing a multi-purpose plant factory used for education or home appliance.



Post-harvest management and functional Vegetable research to increase added value

- Defining the optimum post-harvest conditions to enhance shelf-life of paprika for export;
- Enhancing safety and quality of fresh-cut vegetables;
- Technological upgrade to produce functional vegetables.



Fruit Research



High Quality Cultivar and Advanced Breeding Technology

- Operating systematic breeding programs to release new cultivars of apple, pear, grape, peach, plum, kiwifruit, citrus, persimmon, etc., containing functional compound;
- Developing molecular markers related to fruit quality, disease and insect resistance, color of flesh and fruit skin.



Environment Friendly Production System to Ensure Safe Production & Production Cost Reduction

- Establishing high density apple cultivation system using dwarf rootstock and Y-shape pear Production system;
- Expanding integrated production management programs.



Postharvest Technology to Enhance Fruit Marketability

- Establishing optimum fruit shipping standards;
- Preventing physiological disorder and damage by disease during the distribution;
- Management models of cold-chain and quality control system for Agricultural products Processing Center(APC)

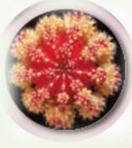


Development of Functional and Medicinal Product to Promote Consumption and Added Value

- Mining fruit genetic resources with high functional and coloration compounds in fruit skin and flesh;
- Developing processed citrus products such as artificial skin for medical use.



Floriculture Research



Global Competitive Flower Cultivar

- Breeding good shape, color, and fragrance of flowers;
- Emphasizing on roses, chrysanthemum, orchid, grafted catci and lily.



Ornamental Crop Physiology and Cultivation

- Clarifying physiological disorders of chrysanthemum export to expand foreign market;
- Under development of high quality and cost-efficient ornamentals production system;
- Establishing Korean indigenous flower cultivation system.



Cut Flower Postharvest Technology

- Standardizing cut flower quality and developing postharvest technology for NIHHS bred rose and lily export.



Urban Agriculture Research



Selection of Planting Resources for Roof Garden

- Selecting ornamental plants for roof gardens;
- Developing roof garden models.



Floral Decoration Technique for Indoor Garden Amenity

- Developing magnetic bar-attached pots for living rooms, offices, and indoor gardens for convenient decoration;
- Flower preservation technique for two to three years by dehydration and adding of various preservatives.



Kitchen Gardens, Weekend Farms and Horticulture Programs to Expand Urban Agriculture

- Designing kitchen garden models suited to Korean life style at balcony, backyard, roof-top and weekend farms;
- Customizing horticultural programs for various classes of people.



Air Purifying Plants and IT-Based Indoor Garden Management

- Developing a digital online cyber program to maximize the air purification effects of horticultural plants;
- Developing a smartphone application to serve indoor plant management information.

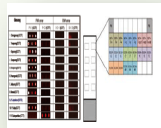


Ginseng Research



Breeding High Quality and Resistant Ginseng Cultivar, and Developing Environment Friendly Production System

- Promoting tolerant ginseng lines to new influencing factors emerged with global warming like high temperature, increasing salinity and pathogens;
- Enhancing breeding efficiency techniques;
- Developing ginseng GAP standard and organic cultivation methods.



DNA Fingerprinting Technology to Distinguish Ginseng Cultivar and Production Place of Origin

- Ginseng age discrimination by comparing specific compounds;
- DNA markers for differentiating cultivars;
- Nano DNA barcode system to assess the place of cultivation origin.



Promotion of Ginseng Functionality and Medicinal Materials and Usage to Improve Added Value

- Investigating positive effect of ginsenosides on growth factor in nervous protection cell of brain;
- Demonstrating improvement effects brain's learning memory by regular intake of ginseng powder



Generalization of Ginseng as a Common Vegetable

- Developing a nyaroponics system for clean and safe ginseng production;
- Enhancing the yield and the economical efficiency by stand-type production system and LED light;
- Focusing on fresh and easy-to-use ginseng foods such as salad, sauce and dressing for added value creation.



Herbal Crop Research



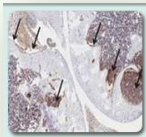
Indigenous Herb Cultivar Development for High Functionality

- Developing diseases and wet-injury resistant cultivars *Rehmannia glutinosa* 'To-kang' and *Atractylodes japonica* 'Sang chul';
- Strengthening local adaptability trials for commonly imported herbs like *Glycyrrhizae Radix et Rhizoma*;
- Developing DNA barcode systems to classify species of plant origins and to discriminate.



Environment Friendly Farming Practices to Produce Highly Qualified Medicinal Herbs

- Establishing standard management guidelines like GAP;
- Developing organic herb production systems for *Angelica gigas* and *Platycodon grandiflorum*;
- Publishing environment friendly pest and disease management manuals.



Exploring Functional Materials to Create Added Value

- Discovering and extracting functional phytochemicals from medicinal plant resources, as well as building functional material database;
- Conducting efficacy tests of anti-inflammation, anti-atopic dermatitis, anti-cancer properties and improvement of memory.



Inspiring Safe Production Management to Apply as Functional and Medicinal Materials

- Improving safe production and postharvest management practices for highly-qualified medicinal herbs;
- Developing processed products as food, health, cosmetic and medicine.



Mushroom Research



Development and Distribution of Mushroom Cultivar for Export

- Developing the world's second white mushroom producing cultivar in the winter mushroom (*Flammulina velutipes*) market in which Japan held a dominant position;
- Developing the beech mushroom (*Hypsizigus marmoreus*) ranked in the second production in Japan as an overseas reexportation item;
- Proliferating the developed commercial mushroom strains to mushroom farmers by the network of regional Agricultural Research & Extension Services, Agricultural Development & Technical Centers and the private spawn companies.



Stable and Environment Friendly Mushroom Production Techniques

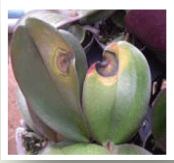
- Analyzing occurrence factors for mushroom disease and developing control measures;
- Developing environment friendly cultivation methods using antagonistic microorganisms and plant extracts;
- Setting up environment control standards in mushroom cultural room and improving mushroom functionality.



Mushroom Functional Materials

- Investigating mushroom functionality such as neuronal effects, anti-fungal, anti-tumor, blood sugar regulation and immune system improvement;
- Developing mushroom functional foods, cosmetics and medicinal materials using mushroom.

Horticultural Environment Research



Diagnosis of fungal and bacterial diseases in horticultural and herbal crops

- Developing sensitive diagnosis and control methods for major diseases such as phytophthora blight;
- Establishing disease monitoring systems for major horticultural crops.



Virus Detection Kits and Production of Virus Free Crop

- Developing viral disease detection kit by combining nanobiotechnology;
- Producing viroid-free chrysanthemum plants to reduce the damage from chrysanthemum stunt viroid.



Insect Pest Ecology and Environment Friendly Control

- Developing biological control models by introducing natural enemies including native species;
- Developing real time orchard pest monitoring systems to support proper spray timing by combining IT and BT.

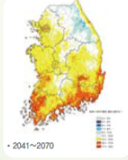


Organic Fertilizer Materials to Reduce Chemical Fertilizer Applications

- Focusing on liquefied manure use (Slurry Composting Biofiltration) instead of using chemical fertilizer;
- Developing green manures and organic fertilizers for environmental friendly production.



Climate Change Research



Analysis of Farming Area Shift by Climate Change

- Developing a digital cartography for the changes of air temperature and crop production regions based on A1B climate change scenario;
- Establishing assessment and adaptation strategies of climate changes.



High-Income Tropical and Subtropical Crops with functionality

- Evaluating climate suitability of tropical and subtropical crops such as mango, passion fruit, okra and artichoke;
- Introducing useful genetic resources such as Indian spinach, curcuma and chayote.



Sustainable Production System for Tropical and Subtropical Crops

- Developing energy saving technology for protected Mango cultivation technology along with optimum fruit thinning and propagation methods;
- Developing pest and disease monitoring and controlling technology.

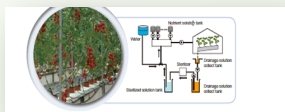


Protected Horticulture Research



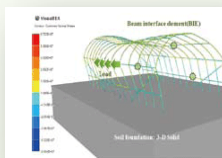
Greenhouse Energy Saving and Automation Devices to Reduce Labor

- Developing energy-saving technology such as multi-layered insulation curtain, solid fuel boilers and substitutes of fossil fuel;
- Developing high-bed strawberry culture system and cucumber stem training device for labor efficiency and reduction.



Greenhouse Environment Control and Production System

- Optimizing greenhouse environment as controlling temperature & humidity and standard of CO₂ application techniques;
- Investigating light and temperature control considering crop productivity;
- Commercializing nutrient solution recipes for each crop;
- Establishing recirculating hydroponic system and fertigation system for environment friendly substrate culture.



Greenhouse Standard Structure Models and Structure Safety Diagnosis System

- Developing specified greenhouse models for paprika, strawberry and tomato based on crop characteristics;
- Developing an easy and speedy greenhouse structure safety assessment system to prevent climatic disasters.



[Technology and Public Service](#)

- **One-Stop Service Focused on Farmers Needs**
- **Technology Transfer through the Convergence of Research and Extension services**
- **Integrating R&D Outputs and Disseminating New Cultivars**
- **Operation of a Public Service Center to Satisfy Farmers and the Public**

[Breeding Technology Service](#)

- **Providing Information of Breeding and Quality-Related Substance Analysis on Breeding Sector**
- **Supporting High-tech Bioassay Methods for Major Diseases**
- **Development and Support of Molecular Markers to Screen Disease-Resistant and Useful Quality Traits**
- **Collection, Evaluation and Dissemination of Germplasm for Private Sector**

The main results obtained by NIHHS for the period 1990/2011 can be accessed by the ["Annual Report"](#).



National Institute of Crop Science

(NICS)

National Institute of Crop Science leads the crop researches of Korea on increasing production, quality and profit by development of new varieties and production technologies in rice, winter cereals, corn and legume crops, industrial crops.

NICS is responsible to establish environment-friendly farming technologies to improve the life quality of farmers as well as peoples in this country. NICS is also responsible for the efficient transfer of new agricultural information developed in the institute to the farmers for their in-time application in farming.

The R&D targets is enhance the quality of life for Korean people by ensuring safe and stable food supply caring for agricultural lands throughout the development of crop science and technologies to satisfy farmers and consumers. The objectives are: Development of new cultivars and cropping technologies for the supply of safe and high quality food and feed; development of functional crops and bio-products with higher values and, Development of environment friendly crop production technologies for sustainable agriculture.

The R&D structure is formed by the following fields: Rice Breeding, Rice Cultivation, Upland Crops, Oilseed Crops and Minor Cereals, Highland Agriculture, Bioenergy Crops, Post-harvest Management and Value Added Promotion, Crop Environment and Practical Application of Crop Biotechnology.

Rice Breeding



rice consumption.

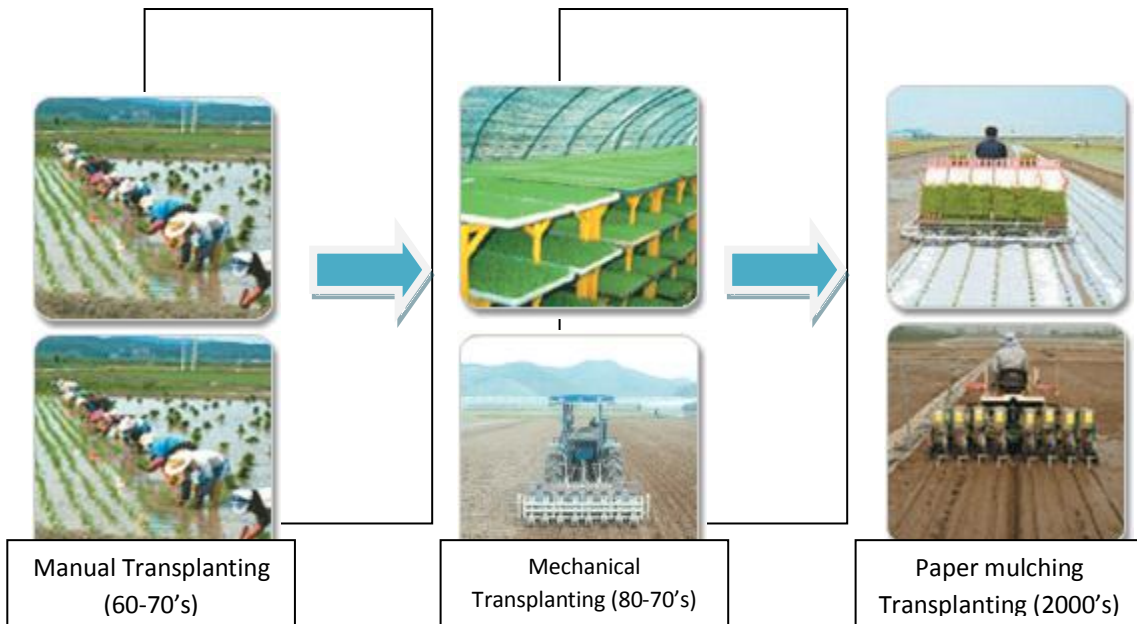
To improve the quality of people's dietary life and to ensure stable food supply, the research focuses on breeding new cultivars with high quality, disease and pest resistance, and high adaptability to various ecosystems. It also aims to develop multi-purpose and functional cultivars to increase



Rice Cultivation



Research on rice cultivation comprises determination of optimal transplanting dates, recommended application rates of nitrogen fertilizer and harvesting seasons, and focuses on development of low-input and labor-saving cultivation technology, and environment-friendly cultivation technology



Upland Crops

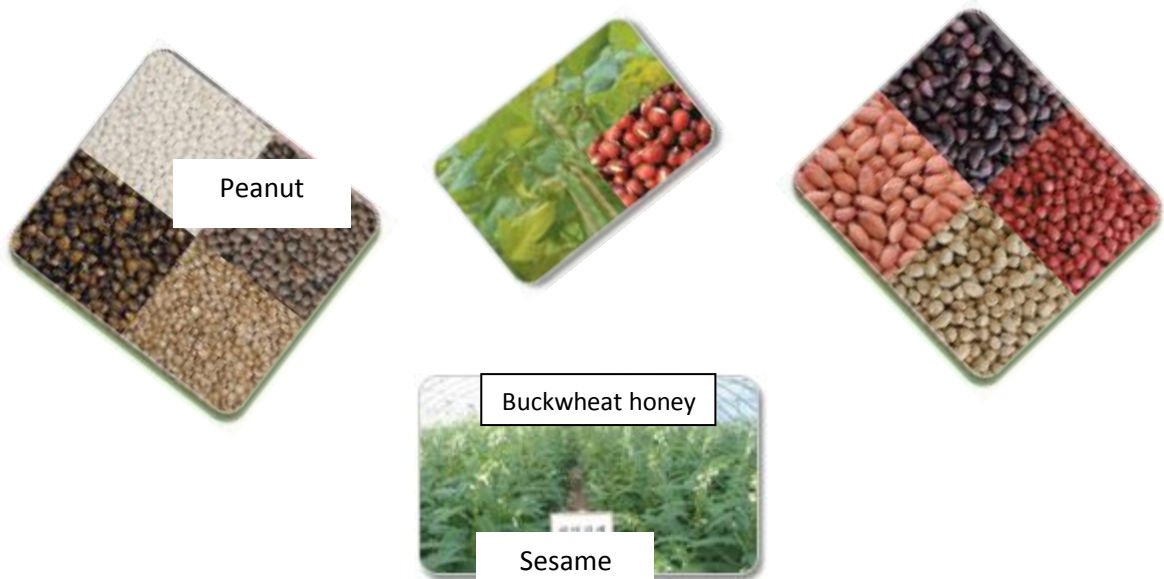
The research focus of winter cereals, bean, corn, and other food crops is on breeding cultivars with good for various uses and high resistant to diverse biotic and abiotic stresses. It also aims at developing the stable production technologies with low cost, labor-saving and mechanization in upland crops





Oilseed Crops and Minor Cereals

To improve value-added oil crops and minor cereals, the research focuses on breeding new cultivars of high quality and functionalities, and developing eco-friendly production technology.



Highland Agriculture

Researchers are contributing to the development of highland agriculture by breeding advanced highland crop varieties like potato, buckwheat, etc., for diverse utilization, and developing environment-friendly cultivation technology for high quality and stable production technology for disease-free seed potato





Bioenergy Crops

Bioenergy Crop Research Center is developing new cultivars of bioenergy and alliums crops, and carrying out the researches on collection, conservation, and evaluation of germplasms. Also, center is investigating effective cultivation technique and post harvest technologies

Breeding of Bioenergy Crops



Development of production process (pretreatment, saccharification, and fermentation) for 2nd generation bioethanol



Multi-purpose and functional Crops





Post-harvest Management and Value Added Promotion

Researchers are focused on establishing post-harvest management system for the supply of safe and palatable agricultural products, identifying functional crops and by-products for value-added promotion, and establishing a criterion and an assessment system for high-quality.

Development of post-harvest management technology



Multi-purpose and functional rice



Crop Environment

Crop environment research focuses on establishing eco-friendly and sustainable agriculture with particular emphasis on reasonable use of pesticides, herbicides and fertilizers. It is also searching for proper ways to preserve agro environmental resources.

Research on green manure crops

A green manure is an herbaceous crop plowed under while green to enrich the soil. Typically, a green manure is grown to help maintain soil organic matter and increase soil fertility.



- Kinds of green manure crops: Legumes (hairy vetch, Chinese milk vetch, clovers etc.); Grasses (rye, barley, oat, rat tail fescue etc.) and for both green manure and landscape (phacelia, sunflower, rape etc).



- The benefit of green manure crops - Substitution of chemical fertilizers through nitrogen fixation, nutrition preservation and soil quality recovery



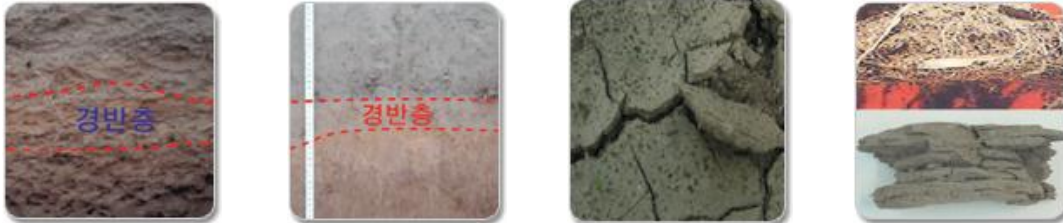
Cropping system and soil management

- Cropping system for eco-friendly agriculture





➤ Management of soil compaction



Research on the environment of reclaimed lands

➤ Eco-friendly management technology of agricultural environmental resources: Inspect soil and make electronic soil map for increasing reclaimed lands utilization



➤ Research on the development of crops adaptable to reclaimed lands and their cultivation methods - Experimental research on the development of crops adaptable to reclaimed lands and their cropping systems.





- Developing eco-friendly management technology for control of pest and disease



Diseases and pest control

- Major diseases and insect pests



- Screening methods for disease and insect pest

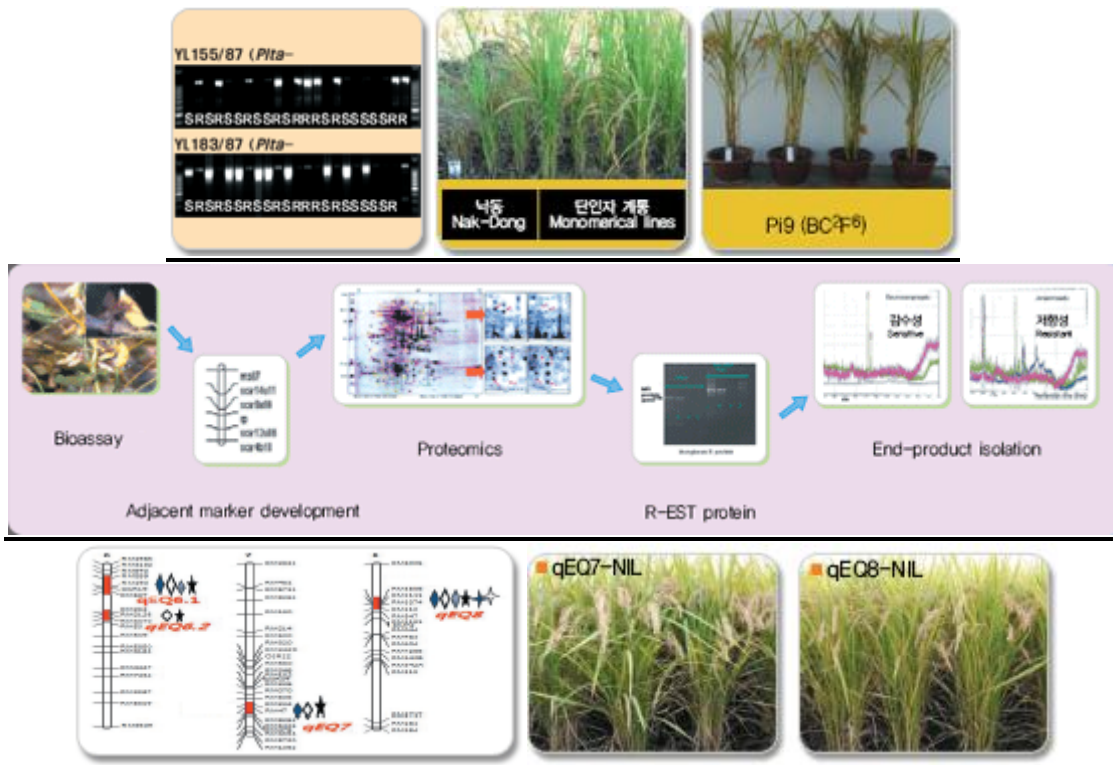




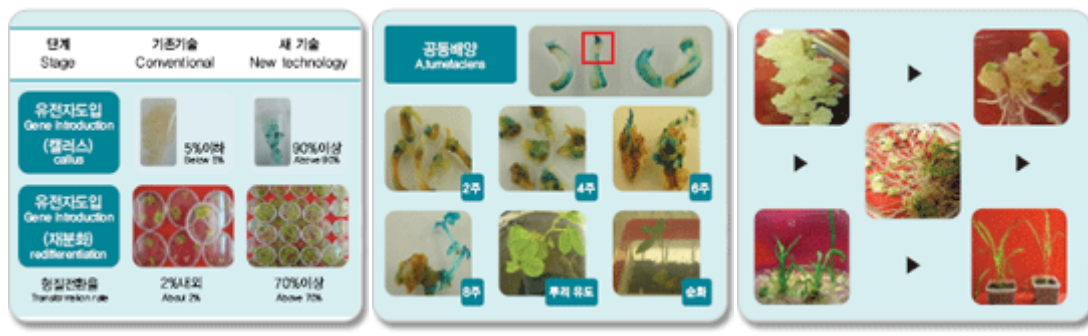
Practical Application of Crop Biotechnology

The research on crop genetic engineering focuses on creating new functionality and resistances to insect pests and diseases of food crops, and increasing breeding efficiency by using molecular markers. It is also aiming to develop mass transformation technology to improve the efficiency of producing new functional crops and elite lines.

Practical application of marker assisted selection

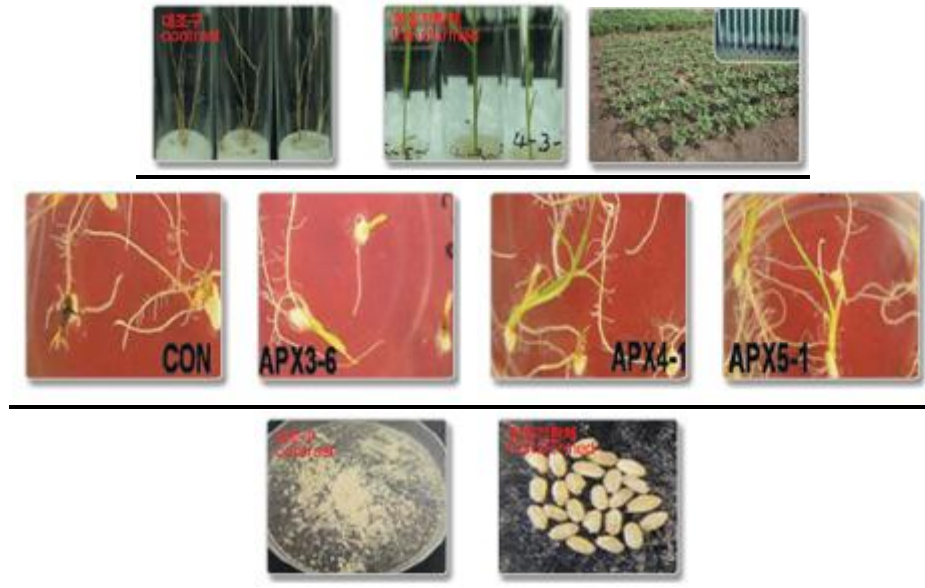


Platform technology





Development of transgenic crops



Crop Information

The National Institute of Crop Science included in its homepage information about crop production and evolution for several crops. To access all information click over the desired species and area.

Rice

- [Introduction](#)
- [Rice varietal in Korea](#)
- [Rice Production in Korea](#)
- [Rice Research Institutes](#)

Wheat & Barley

Grains Industrial Medical Crop

- [Peanut](#)
- [Sesame](#)

Soybean

- [Production and consumption in Korea](#)
- [Circumstance of cultivation and cropping pattern](#)
- [Varietal improvement](#)
- [Environmental condition](#)
- [Cultural practices](#)