An age-old activity, agriculture is today at the heart of a series of changes linked to key societal challenges, including sustainably managing renewable natural resources, food security, nutrition, and health security and equity, establishing new systems for ensuring animal and human health, and finding sustainable alternatives to fossil carbon use.

At the global level, agriculture must also respond to a triple challenge with respect to food, energy, and the environment.

In addition to growing scarcity in natural resources, including soil, water, and biodiversity, world agriculture must confront the effects of climate change, especially higher temperatures, more variable rainfall, and more frequent extreme climatic conditions, such as flooding and drought.

In such a context, research activities are opening out into new areas of study and technological breakthroughs, including robotics and precision techniques for agriculture, ecotechnology, biotechnology and bioinformatics, big data, water management technologies, etc.

The goal is to develop agriculture with high economic and social value while preserving resources and enhancing the environment.

To respond to these challenges, France has launched the Agriculture Innovation Program 2025, featuring four key themes:  
> Strengthening research on agricultural soil, agriculture, and climate;  
> Positioning agriculture at the heart of the French research strategy;  
> Connecting digital technology and agriculture; and  
> Promoting innovation by linking farmers, business, and actors in research and education within local ecosystems.

Agricultural research in temperate environments is principally the sphere of the French National Institute for Agricultural Research (INRA). In addition, other institutions and bodies are also making significant contributions, including the National Institute for Scientific and Technological Research for the Environment and Agriculture (IRSTEA), the Center for International Cooperation on Agricultural Research for Development (CIRAD), the Research Institute for Development (IRD), which focuses on agronomic research in tropical and Mediterranean environments, the National Agency for Health, Food, Environment, and Work Security (ANSES), and various higher education and agronomic research institutions.

The term «agrobioscience» covers sciences and techniques used in agriculture-related fields—among them plant and animal production, the food industry, land and forest planning, environmental protection, natural resource management, and health.

“At the global level, agriculture must also respond to a triple challenge”

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Agreenium, l’Institut agronomique, vétérinaire et forestier de France (French Institute of Agronomy, Veterinary Medicine, and Forestry) • https://agreenium.fr

Agreenium brings together four research bodies (INRA, CIRAD, IRSTEA, ANSES) and 15 higher education and research institutions that provide training in engineering, veterinary medicine, and landscape design and offer Masters and PhD programs. Agreenium’s member organizations bring together 6,800 researchers, teaching researchers, and research engineers in nearly 300 research units, most commonly in joint research clusters (JRCs) within the National Center for Scientific Research (CNRS), which has 2,500 doctoral students.

Allenvi, Alliance nationale de recherche pour l’environnement (National Environmental Research Alliance) • www.allenvi.fr

ALLENVI manages public research in order to plan and coordinate the French environmental scientific strategy on various topics, including agroecology and soils, food and the food industry, animal life, biodiversity, climate, water, ecotechnologies, environmental assessment, the seas, plants, risks, land use, towns and cities, and mobility. ALLENVI labels research infrastructures, long-term observation, and testing systems for environmental research and Biology, Health, and Agronomy Infrastructures (IBiSA) platforms.

Anses - Agence nationale de sécurité sanitaire de l’alimentation et du travail (Food, Environmental and Occupational Health & Safety Agency) • www.anses.fr

A scientific body, ANSES has 11 reference and research laboratories focusing on food, animal, and plant health. With its teams of specialists, it assesses risk in its fields of expertise and issues marketing authorizations for veterinary medicine, phytopharmaceutical products, biocides, etc.

Cirad - Centre de coopération internationale en recherche agronomique pour le développement (Cluster for International Cooperation on Agricultural Research for Development) • www.cirad.fr

CIRAD is a French organization dedicated to agricultural research and international cooperation for sustainable development in tropical and Mediterranean zones. It places its scientific and institutional expertise at the service of public policy-makers in countries of the South and initiates international debate on agricultural challenges.

CIRAD structures its research around six major areas:
- Public action for development: Strengthening public action to reduce structural inequalities and poverty,
- Intensive ecological agriculture: Creating agriculture that promotes agroecosystems sustainably,
- Sustainable food industry: Ensuring food security in societies of the South,
- Plant and animal health: Understanding, anticipating, and managing risks linked to animal and plant bioaggressors,
- Societies, natural environments, and the land: Supporting societies toward sustainable land management,
- Promotion of biomass: Innovating for the sustainable use of biomass for non-food purposes.

Inra - Institut national de la recherche agronomique (National Institute for Agricultural Research) • www.inra.fr

The leading agricultural research institute in Europe and second in agricultural sciences worldwide, INRA conducts research in the major challenges facing society over food, agriculture, and the environment, viewed today within the broader framework of bioeconomies and food systems.

The institute brings together over 1,800 researchers, 2,600 engineers and assistant engineers, and 3,500 full-time technicians and administrators in its laboratories. Every year, it hosts close to 2,500 interns and over 500 paid doctoral students.

The institute is organized into 13 departments supervising and managing the scientific work of 184 research units and 45 testing units spread out over 17 centers all over France, the French West Indies, and French Guiana. Since 2010, INRA has funded the following eight major transdisciplinary research programs: Adapting agriculture and forests to climate change; Food practices and behaviors; Transitions for global food security; Management of agroecosystem services; Integrated management of plant health; Integrated management of animal health; Metaomics and microbial ecosystems, and Genomic selection.

http://metaprogrammes.inra.fr

Carnot Institutes Network • www.instituts-carnot.eu

The network of 38 Carnot Institutes is dedicated to research aimed at industry. Several institutes conduct research in agrobiosciences: Bioenergy, Biomolecules, and Biomaterials from Renewable Carbon (3BCAR), AgriFood Transition, Livestock Industry for the Future, Sustainable Engineering of Georesources (ISIFoR), Innovations for Enhancing the Sustainable Competitiveness of Crop Production (Plant2Pro), and Sensory and Nutritional Quality of Foods as Part of a Sustainable Food Availability (Qualiment).

IFREMER contributes to the monitoring of the marine environment at all levels and to the understanding of ecosystems, processes governing these, and the services they offer in a context of global change. It designs and implements research and monitoring infrastructures for the marine environment. It also operates a significant amount of the French oceanographic fleet for the benefit of the scientific community.
Carbon storage of cultivated land. Its agricultural research is targeted at strengthening food security, and reducing inequalities. It also operates on the emerging diseases caused by climate change, sustainably managing resources, crises, crisis prevention, and preparation mechanisms for mitigating the impacts of intertropical and Mediterranean developing countries. It is involved in the study of genes to the end-point use of agricultural sciences, human and social sciences) of multidisciplinary skills (biological sciences, engineering; and Spatial information systems for integrated environmental agriculture; Technological innovations for sustainable agriculture and the development of advanced plant biology, agrofood technologies, and the management of natural resources.

One of its unifying themes is the application of agroecological concepts and methods to increase the viability of agroecosystems and all agricultural land as well as the capacity to do so. The goal of Labex COTE is to understand and predict the responses of ecosystems to human-induced change and provide tools and methods for regulating and managing their development.

http://cote.labex.u-bordeaux.fr

Labex Europe Embrapa (Brazil)
CIRAD, INRA, and IRD have appointed Agropolis, Montpellier, and the regional consortium of 28 research and higher education institutions to manage this Labex Europe, inaugurated in 2002, and exported to other countries (South Korea, China). The three research topics of the Labex Europe program take account of the scientific priorities common to Brazil and France, including the development of advanced plant biology, agrofood technologies, and the management of natural resources.


Labex Tulip
Ecologie et biologie végétale (Ecology and Plant Biology)
The interdisciplinary approach to biology and ecology focuses on interactions between organizations and communities in natural and human-modified environments with the goal of developing new applications in ecotechnology and preservation biology.

www.labex-tulip.fr

Labex SP5
Sciences des Plantes de Saclay
(Saclay Plant Sciences)
SP5 Labex brings together about 50 research teams specializing in plant sciences from four institutions in the Paris area and a staff of 700. Its research activities deal with understanding the genetic, molecular, and cellular instruments controlling plant development and physiology and their interactions with the biotic and abiotic environment.

https://www6.inra.fr/saclay-plant-sciences
COMPETITIVENESS CLUSTERS

- **Agri Sud-Ouest innovation** - www.agrisoil.fr
  This cluster develops collaborative projects around three key axes: development of agroenergny and promotion of all elements of agricultural production; improvement in the efficiency of production systems from field to factory in order to increase competitiveness; and optimization of production inputs for cleaner and more productive agriculture.

- **Aquimer: Cluster for Aquatic Products** - www.poleaquimer.com
  The cluster aims to maximize available resources and create new resources in the context of sustainable development and in the face of increased demand for aquatic products, the need for fish catches, and the development of aquaculture. Aquatic products must be positioned in the food of the future and the fundamentals of the aquatic industry must be modified so that new professional and technological approaches can emerge.

- **Céréales Vallée** - www.cereales-vallée.org
  This cluster is directed at the cereal sector from seed to finished product to optimize and increase cereal production, facilitate the processing of cereals into quality animal products, respond to food needs by alloying nutrition and usage quality, and promote renewable resources, namely cereal agromaterials.

- **Industries & Agro-Ressources** - www.iar-pole.com
  Operating at the heart of plant biochemistry and industrial technologies, this cluster is devoted to bioeconomics for advanced biofuels, agromaterials, biomolecules, and ingredients.

- **Nutrition Santé Longévité** - www.pole-nsl.org
  This cluster constitutes a point of convergence between health and agriculture and interconnects its strategic axes between the diseases of modern society (cardiovascular, metabolic, neurodegenerative, inflammatory) and food.

- **Qualitropic** - www.qualitropic.fr
  This cluster of tropical bioeconomics is located in Réunion Island (Indian Ocean) and supports the development of key technologies: biorefinery, biotechnologies (plant, marine, industrial, health, environment), biomass combustion, depollution, ecoextraction, ecological intensification, methanization, photobioreactors, and protein substitution.

- **Terralia** - www.pole-terralia.com
  This cluster specializes in the plant sector (fruit, vegetables, olive, vines and wine, spices and aromatic plants, etc.). It focuses its actions on sustainable, innovative, and digital agriculture; conservation, processing, and extraction processes (ecoextraction technologies, ecopackaging creation, recycling of organic waste); improvement in the taste, health, and nutritional quality of products (nutritional properties, food security); distribution; and tomorrow’s foods.

- **Valorial** - www.pole-valorial.fr
  This cluster focuses on agrofood competitiveness and covers nutritional health, ingredients, food quality and security, processes, meat products, fruit and vegetables, egg products, milk and its by-products, and packaging.

- **Vegepolis** - www.vegepolis.eu
  The cluster is the reference point for the production through breeding and farming practices of special plant products that are respectful of the environment and human health. Its goals are plant breeding, marker-assisted selection and breeding, phytoprotection, phytodiagnostics, and phytochemistry.

- **Vitagoras** - www.vitagora.com
  This cluster focuses on the theme of Taste, Nutrition, and Health and concentrates on food products and food preparation and cooking equipment, food supplements for optimizing consumer well-being. Vitagora promotes three strategic axes: preservation of the environment, preservation of health capital, and the development of taste enjoyment.

  This cluster is dedicated to products and materials from cultivated forests.
AGROECOLOGY – FROM ORGANIC FARMING TO SUSTAINABLE DEVELOPMENT

An agroecological approach aims to provide French agriculture with an ambitious perspective by encouraging new, high-performing production systems in three economic, environmental, and social areas:

> Producing in a novel manner by optimizing the use of natural resources and processes;
> Preserving the resources on which agricultural production and people depend; and
> Responding to society’s demand for moving agriculture toward new growth models.

RESEARCH PROJECTS AND INTERNATIONAL RESEARCHER NETWORKS

Arcad
www.arcad-project.org

Intended to establish a new, open, and multifunction platform (conservation, research, and training) and dedicated to the evaluation and improved use of biodiversity in plants grown in tropical and Mediterranean areas, ARCAD operates in partnership with INRA, CIRAD, Montpellier SupAgro, and IRD.

CORE ORGANIC: Coordination of European Transnational Research in Organic Food and Farming Systems
www.coreorganic.org

Working for European research, this European Research Area (ERA)-Net cofund aims to increase cooperation between national research activities. Core Organic’s overall goal is to promote the quality, relevance, and use of resources in European research in organic food and agriculture and create a community able to finance transnational research on organic farming.

ORG-COWS: Toward Preventive Health Management in Native Dual-purpose Cattle Adapted to Organic, Pasture-based Production Systems via Novel Breeding Strategies Based on Novel Trait Recording.
http://projects.au.dk/coreorganicplus/research-projects/2-org-cows/

The goal of this cluster is to adapt dual-purpose breeds to low-input, pasture-based systems and organic farming. Three French partners are involved: IDELE (Livestock Farming Institute), ITAB (Organic Farming Technical Institute), and INRA.
A UNIQUE, ONLINE-ACCESS INFORMATION POINT FOR LOCATING RESEARCH PROJECTS

**DIRECTORY OF DOCTORAL INSTITUTIONS**
Point of entry for starting a PhD and the 270 doctoral institutes organizing and supervising doctoral training.
> Search by key words, regions, and disciplines;
> Comprehensive information on doctoral institutions:
  - Research areas, criteria and points of contacts for admission, welcome mechanisms, proposed topics, current financing, international dimension, and points of contacts for associated research laboratories;
> Access to fields offered by each doctoral institutions.

13 doctoral institutions in agronomy and ecology, accessible at:
https://doctorat.campusfrance.org/en/phd/dschools/main

**PhD TOPICS, LABORATORY INTERNSHIPS, AND POST-DOCTORAL STUDIES:**
> Offers financed through doctoral contracts, Industrial agreements for training through research (CIFRE), and specific offers devoted to programs financed by foreign governments;
> Offers for internships for experience in laboratory research;
> Post-doctoral offers for work in French laboratories;
> A detailed financing mechanism for each research offer (PhD topics, post-docs, and internships);

Almost 200 offers made public in agronomy and ecology each year, accessible at: https://doctorat.campusfrance.org/phd/offers > Agronomy-Ecology > Domains and Disciplines.

**UNDERSTANDING FRENCH RESEARCH**
> Understanding how PhDs operate in France,
> Knowing how to start and finance a PhD;
> Applying to international research programs (Hubert Curien Partnerships, Make Our Planet Great Again).