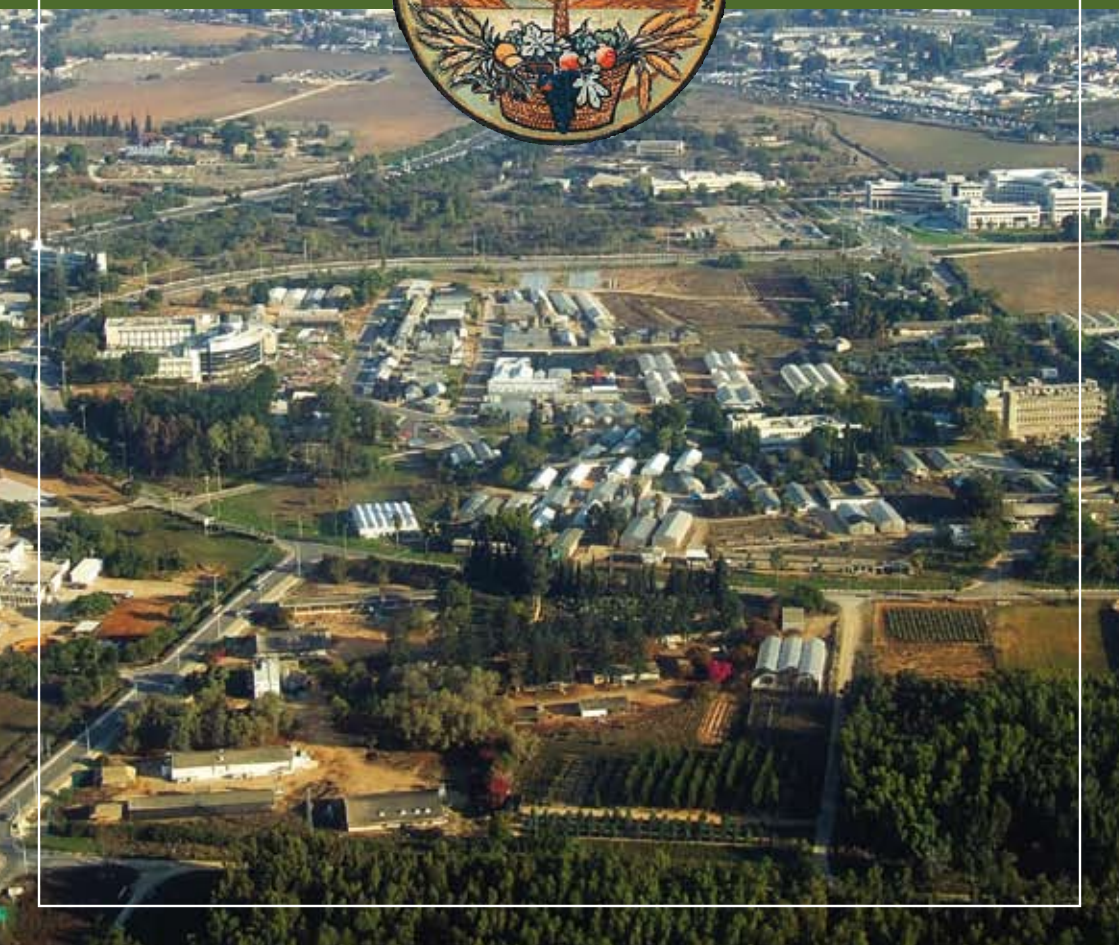


State of Israel
Ministry of Agriculture & Rural Development

Agricultural Research Organization Volcani Center





Agricultural Research Organization - Volcani Center

The Agricultural Research Organization (A.R.O.) is the central governmental research institute for agriculture in Israel.

The center is named after its founder, Dr. Yitzhak Elazari-Volcani, who in 1921 established the Agricultural Experiment Station in Ben-Shemen and in Tel-Aviv. In later years it became the ARO-Volcani Center. ARO is among the best-known agricultural research centers in the world, with an infrastructure that supports both basic and applied research in agricultural and environmental sciences.

Personnel at ARO include approximately 200 PhD scientists, 340 engineers and technicians, and 220 graduate students. ARO consists of six research institutes located at the main campus near Rishon LeZion and two regional research centers: 'Newe Yaar' in the north and 'Gilat' in the south. The institutes are: Plant Sciences; Animal Science; Plant Protection; Soil, Water and Environmental Sciences; Postharvest and Food Sciences; and Agricultural Engineering.

Most of the information developed at ARO is available to the public at large, while some is commercialized through ARO's 'Kidum' R&D Applications unit. Beneficiaries of the achievements of ARO include farmers, agricultural industries, and above all—Israeli consumers, who enjoy a variety of high quality agricultural products grown under environmentally-sustainable conditions.





Institute of Plant Sciences

The Institute of Plant Sciences is the largest of the six institutes in ARO. Its main goal is to develop and put into practice knowledge relevant for agricultural plants and management of open areas. The Institute consists of four departments: Field Crops and Natural Resources, Ornamentals, Vegetable Crops, and Fruit Trees. In addition, the Israel Plant Gene Bank (IGB) is an integral part of the Institute. The Bank is dedicated to collection, preservation, maintenance and characterization of local seeds and plants that are wild relatives of agricultural plants. Research in the Institute combines both basic and applied knowledge for the advancement of production of grains, fruits, vegetables, ornamentals and specialty crops. Scientists at the Institute develop new agricultural commodities using genetics, agro-technology, physiology, molecular biology, and biotechnology.



Among the leading research areas of the Institute are:

- Breeding and improvement of fruit and vegetable crops including new techniques to accelerate breeding programs
- Introduction and acclimation of new crops such as vegetables, herbs, medicinal and ornamental plants
- Understanding processes of rooting and propagation in ornamental plants and fruit trees
- Development of methods to produce out-of-season fruits and vegetables, and improved pollination and fruit set
- Development of plants for use as biodiesel fuel
- Development and management of forests and open areas, breeding forest trees and improving the productivity of grazing lands
- Identification of genes involved in determining the size and shape of fruits, regulation of flowering, stability of pigments in flower petals, and various aspects of fruit quality



Institute of Animal Sciences

The Institute of Animal Sciences is made up of two departments - Poultry and Aquaculture, and Small and Large Ruminants.

The main goal of the Institute is the development of science and technology for the advancement of animal agriculture in Israel. Research has resulted in enhanced productivity of animals and increased quality of animal-derived products, along with reductions in costs and waste. Technology developed at the Institute has led to increased efficiency in production of milk, eggs and fish. Currently the Israeli cow has a world record production averaging around 12,000 liters per annum. Concomitantly a decrease in pollution associated with animal production has been achieved, as well a reduction in the import of animal feeds.



Applied research at the Institute includes:

- Breeding cattle for enhanced milk production and quality
- Breeding sheep for increased prolificacy
- Developing treatments for enhanced genetic resistance to diseases of small and large ruminants
- Improving grazing infrastructure for beef cattle
- Enhanced heat stress resistance in poultry
- Improved profitability in raising fish, poultry, cattle, sheep and goats
- Development of organic aquaculture
- Ornamental fish production
- New nutritional approaches for improving fish production while reducing water pollution



Institute of Plant Protection

The Institute of Plant Protection consists of two departments: Entomology, Nematology and Chemistry, and Plant Pathology and Weed Research.

Research at the Institute is focused on identification and characterization of insects, nematodes, fungi, bacteria, viruses, phytoplasmas and weeds known to cause damage to agricultural produce. Scientists at the institute develop environmentally friendly methods for efficient control of pests. These include bio-pesticides, physical treatments, breeding resistant plants, and integrated pest management. The aim of this research is to produce agricultural goods that are free of both chemical residues and disease-causing organisms. In addition, researchers at the Institute develop expert systems for decision-making to maximize the effectiveness of plant protection methods.

Examples of research at the Institute:

- Identification and characterization of pests and sources of disease in plants; research on the mode of pathogenicity of bacteria, viruses and fungi; and population dynamics of plant pests
- Precision control of weeds
- Breeding pest-resistant plants
- Development and application of methods for biological control of pests, especially for organic farming
- Development of decision-making systems for effective pesticide application with reduced chemical use
- Isolation, identification and application of pheromones for control of insect pests
- Physiology, genetics and biochemistry of insects and nematodes
- Production of propagation material that is free of disease-causing organisms
- Development of means of controlling water-borne diseases in irrigation systems and in recycled water
- Use of viruses as vectors for expressing foreign genes in plants



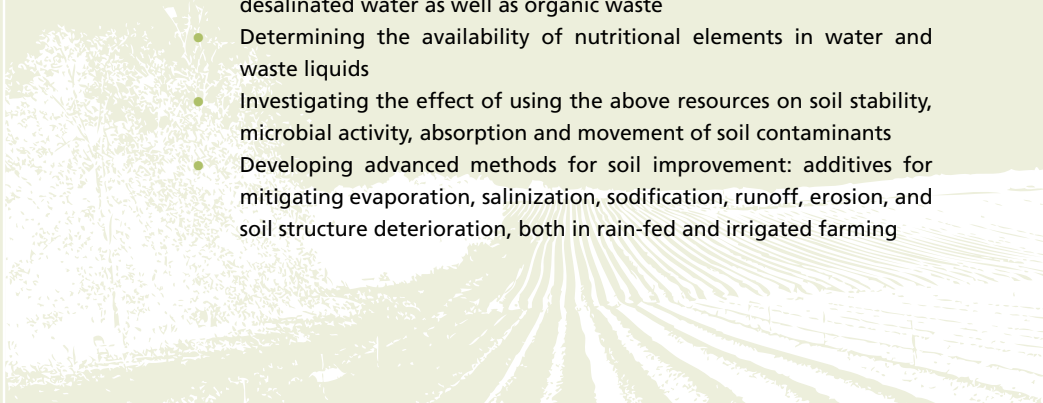
Institute of Soil, Water and Environmental Sciences

The Institute of Soil, Water and Environmental Sciences consists of two departments: Environmental Physics and Irrigation, and Soil Chemistry and Microbiology.

Research activity at the Institute is focused on the interaction between soil, plants, and the atmosphere and on optimizing the responsible use of soil and water resources in Israel. The goal of the research is to develop productive sustainable agriculture, while protecting the environment by limiting soil and water pollution.

Among the research projects in the Institute:

- Developing efficient and environmentally-friendly methods of irrigation, fertilization, climate control and cultivation in open fields, screenhouses, and greenhouses
- Developing physical models for quantification and prediction of water and solute movement from the soil surface to underground water reserves to enable optimization of irrigation regimes and for evaluation of the danger of soil and water contamination by various pollutants
- Safe and effective agricultural use of fresh, gray, brackish, flood, and desalinated water as well as organic waste
- Determining the availability of nutritional elements in water and waste liquids
- Investigating the effect of using the above resources on soil stability, microbial activity, absorption and movement of soil contaminants
- Developing advanced methods for soil improvement: additives for mitigating evaporation, salinization, sodification, runoff, erosion, and soil structure deterioration, both in rain-fed and irrigated farming





Institute of Postharvest and Food Sciences

The Institute of Postharvest and Food Sciences consists of two departments: Postharvest Science of Fresh Produce and Food Quality and Safety. The main research topics of the Institute involve the quality, security and healthiness of fresh and processed animal and plant products, both for export and for local consumption. Basic and applied research projects combine to develop and expand the markets for Israeli agricultural products, while ensuring both consumer health and farmer income.



Prominent research areas of the Institute include:

- Extending the storability and shelf-life of fresh harvested agricultural produce
- Extending the shelf life of fresh-cut and processed plant and animal products
- Developing controlled atmosphere protocols to delay ripening, senescence and rotting in fresh produce and to control pests in stored grains
- Alternate methods for chemical control of pathogens
- Enhancing vase life and quality of cut flowers, ornamental branches, pot plants and propagation material
- Improving sensory attributes and nutritional levels of fresh produce.
- Improving the safety of fresh, fresh-cut and processed plant and animal products
- Improving the quality of milk and dairy products
- Methods to prevent fungal infestation and mycotoxin contamination in fresh and dried produce
- New technologies in silage production



Institute of Agricultural Engineering

The Institute of Agricultural Engineering is the only research organization in Israel whose activities encompass a wide range of engineering and technological topics relating to all aspects of agriculture. The institute consists of two departments: Sensing, Information, and Mechanization Engineering; and Growing, Production and environmental Engineering. The main objective of the Institute is the development of advanced engineering technologies that improve production for the benefit of growers, consumers and the environment. The diverse research projects at the Institute are the foundation for the application of new technologies to the Israeli and world agriculture.



Among the projects of the Institute are:

- Robotics, mechanization and automation of processes aimed to reduce the amount of manual labor in growing, harvesting, and post harvest procedures
- Developing sensors for sorting fresh produce according to size, quality and other properties
- Improving the structure of agricultural buildings such as greenhouses and animal houses
- Climate control in greenhouses, animal houses and barns
- Development of innovative specialized spray technologies
- Optimization of management and decision making procedures
- Quality management, assurance, and production engineering
- Remote sensing and GIS for precision agriculture





Gilat Research Center

The Gilat Research Center is the southern branch of the Agricultural Research Organization. It is located in the northwestern Negev region on loess soil. Gilat is a leading research center for developing

methods of agricultural production that are appropriate for arid and semi-arid regions such as the Negev and Arava.

The main research topics include:

- Field crops: Improving sustainability and productivity of rainfed field crops, wheat quality, precision agriculture utilizing remote sensing, prediction of nitrogen and phosphorus availability in the soil.
- Rangelands: Natural resources, desertification, planted pasture for grazing in arid areas.
- Tree crops: Fruit trees cultivation in semi-arid conditions with focus on citrus, olives including olive oil quality, guava apricot, pollination and bee forage, Vegetable crop physiology under stress conditions.
- Plant protection: Biological pest control, pest resistance to pesticides, environmentally friendly pesticides, control of nematodes in conventional and organic agriculture, Epidemiology and control of soil- and potato seed-borne pathogens, Plant disease diagnostics.
- Soil and water: Managing water in the arid zones, utilization of saline, treated and recycled waste water for irrigation; Mineral nutrition of vegetables and herbs in greenhouses and of olives.





Newe Yaar Research Center

The Newe Yaar Research Center is the northern branch of the Agricultural Research Organization. Research at the center is interdisciplinary, with main efforts focused on cucurbits, herbs, weeds and beef cattle.



Prominent research activities at Newe Yaar include:

- Cucurbits: Breeding of new cultivars, with an emphasis on natural pest resistance and on improvement of fruit quality.
- Herbs: Introduction, breeding, agrotechnology and physiology of culinary, medicinal and aromatic herbs. Chemistry and biological mode of action of natural products.
- Weeds: Developing biological methods of weed control and eradication, including integrated management and precision methods for conventional and organic agriculture.
- Beef cattle: Breeding for efficient production; interaction of animal behavior and energy balance with pasture location for improved grazing and production efficiency; effect of stress on cattle health.
- Pomology: Acclimatization and breeding of deciduous fruit varieties; preservation of ancient fruit varieties and wild relatives for future breeding; identification of genetic markers for desirable traits.
- Environment: Recycling waste from olive presses and its use in agriculture; characterization and neutralization of noxious odor in manure, sewage and sludge; compost based on organic waste.
- Entomology: Developing and applying environment-friendly management regimes for controlling arthropod pests in agriculture by the use of parasitoids and predatory mites and the manipulations of symbiotic bacteria



"KIDUM" Unit

The Agricultural Research Organization (ARO) has proven accomplishments in the development of innovative products and technologies, including items of interest to industry in Israel and abroad.

The interaction of ARO with commercial entities is conducted by the Kidum unit which deals with the following topics:

- Identifying research projects with the potential for commercialization, and presenting business opportunities to commercial organizations
- Economic and business consulting together with testing and evaluation aimed to set expectations for the success of the project
- Evaluating possibilities for research collaboration with commercial companies and /or funding of projects by business entities
- Negotiation, preparation and signing of agreements for joint projects between the ARO and commercial companies
- Protection of intellectual property rights derived from developments of ARO researchers, by registering patents and plant breeder's rights on behalf of ARO and the State of Israel all over the world
- Granting of licenses for the use of varieties and other technologies developed at ARO

The ARO has to its credit more than 350 registered plant varieties, 180 patent families and more than 400 commercial agreements with corporate customers in Israel and abroad. Kidum operates to disseminate the scientific knowledge developed at ARO and to turn it into practical applications in agriculture and industry, while maintaining the intellectual property rights of ARO and the State of Israel.

Contact with Kidum:

Phone: 972-3-9683298

Fax: 972-3-9604835

kidum@volcani.agri.gov.il



Agricultural Research Organization - Volcani Center

Head office

Tel: 972-3-9683226

Fax: 972-3-9685327

E-mail: hvered@volcani.agri.gov.il

Spokesperson's office

Tel: 972-3-9683215

Fax: 972-3-9683292

E-mail: Spokesperson@volcani.agri.gov.il

The Joshua Wax Unit for Science Oriented Youth Volcani Center

Tel: 972-3-9683775

Fax: 972-3-9683696

E-mail: noshem@agri.gov.il

P.O. Box 6 Bet-Dagan 50250, Israel

www.agri.gov.il