

**ACTIVITY
REPORT**
2023

IRTA[®]



Generalitat
de Catalunya



ACTIVITY
REPORT
2023

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INNOVATION AND RESEARCH INTO WATER MANAGEMENT AND TO ENSURE COMPETITIVENESS

In last year's IRTA report, Teresa Jordà, the then Minister of Climate Action, Food and the Rural Agenda of the Catalan Government (DACC), stressed that we needed to be prepared to face the drought. Twelve months later, and as the Director General of IRTA notes in the report that you now have in front of, the lack of water has had a particularly significant impact on the agricultural sector.

DAVID MASCORT I SUBIRANAS

Minister of Climate Action, Food and the Rural Agenda and President of IRTA



We have been experiencing the most severe drought since records began, both in terms of duration and intensity, as well as in terms of the area affected. The DACC has been working hard to support our sector. Above all, by **implementing urgent measures to alleviate the effects of this situation on farms**, as well as approving significant financial aid to compensate for the expected production losses. Through these and other actions, we have helped safeguard the economic viability of farmers and the rural world as a whole, while protecting food security and the sustainability of the sector.

We have also carried out joint projects with IRTA and other organisations to improve water management and agricultural productivity in the long term, including the use of remote sensing and other advanced technologies to predict the water demands of crops. IRTA, our research institute, has been researching and innovating along these lines for many years, because we know that appropriate water use will be one of the most important issues in the coming decades, in a context of climate crisis, competition for energy resources and a growing world population.

Also, as you will see in the report you are about to read, IRTA has dozens of projects underway all over the country that offer 360-degree support to the agri-food sector, which today cannot detach its competitiveness from environmental sustainability and the health and well-being of people. One example **is the launch of the pioneering Centre for Innovation in Alternative Proteins (Centre d'innovació en Proteïnes Alternatives; CiPA)**, to create alternative sources of protein to complement the consumption of meat, fish and dairy products.

I am very pleased with our joint work with IRTA, an institute that the Government has every confidence in to spearhead the scientific research and technological innovation that the Catalan agri-food sector needs. I would like to express my gratitude to all the professionals at this research centre that I have the honour of presiding over. Through its new strategic plan, IRTA **is already outlining the path to be followed over the next decade** and I am sure that it will be key to building a more efficient and sustainable future for our valuable and essential agri-food system.

BUILDING THE IRTA OF THE NEXT DECADE

You have in front of you the summary of an intense year, full of projects, challenges and exciting times. Throughout 2023, we have remained focused on helping to build **a more efficient and environmentally, socially and economically sustainable agri-food sector**, placing research and innovation at the heart of our strategy. As allies on this journey, we are supported by the main players in the sector and by many of the country's institutions.

There have been many challenges, but one in particular has undoubtedly played a leading role: the drought. The year 2023 will be remembered for its lack of water and how this has primarily impacted the agricultural and livestock sectors. As a leading institution in this field, **we have worked hard to improve water management**, promoting its more responsible and efficient use and adapting to the challenges of drought.

In fact, for more than thirty years now, IRTA has been at the forefront of water management research in Catalonia. This has enabled us to deliver **practical and innovative solutions to farmers**, advising them on how to cope with the increasingly severe impacts of the drought. We have driven research projects to **boost scientific knowledge on the water needs of crops** and adapted protocols to the different agricultural sectors, from rice paddies in the Delta to rainfed fields. Likewise, and together with the Irrigation Office, we have established a network of technical experts dedicated to monitoring the region's water needs, advising irrigation communities and developing irrigation management platforms.

Internally, we will also remember 2023 for the **development of our 2024-2027 Strategic Plan**, the result of a far-reaching participatory process in which we encouraged active listening and in-depth dialogue with the social, scientific and economic stakeholders in our country and our immediate surroundings, as well as with a significant number of the organisation's staff. The strategic plan is designed to shape the IRTA of the coming decade, which will equip us to tackle the most pressing challenges facing the agri-food sector.

In this new phase, we will be focusing our scientific activity on four main areas of work: the resilience of our sector to climate change; the sustainable intensification of production; One Health; and finally, digitalisation and the promotion of transformative technologies.

Beyond the scientific challenges, the new strategic plan explains that we want to encourage the recruitment of talent, putting people at the centre of our priorities, because we aspire **to be an institution capable of attracting and retaining the best professionals**. It is also time to enhance the value of our research and to connect and establish powerful alliances with key players in the sector both nationally and internationally.

We want to engage society in all these goals. In this sense, our commitment to communication is essential so that we can listen to the concerns of the public and put our knowledge at their service.

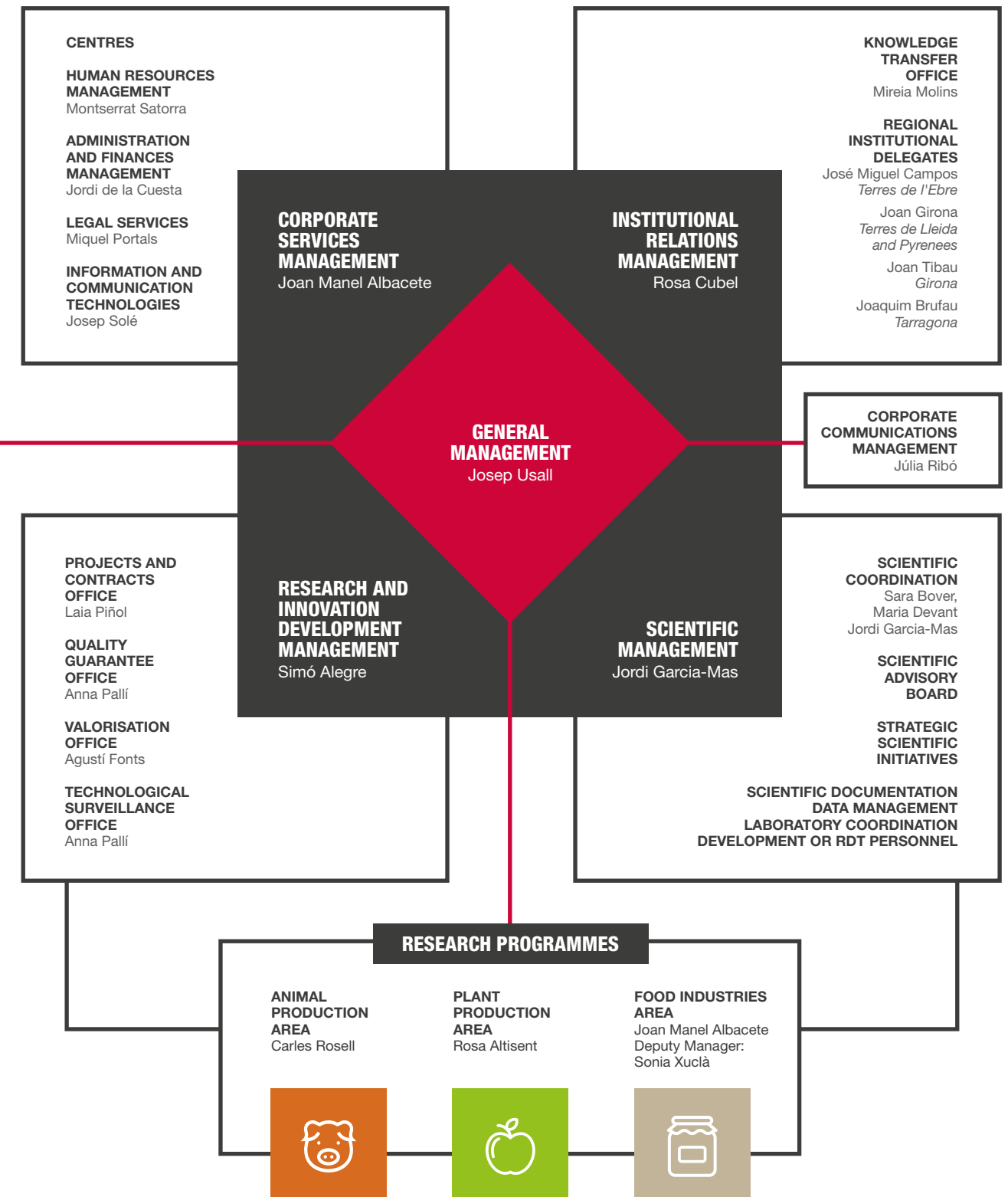
We approach the future with determination, enthusiasm and optimism, and we are convinced that our contribution will be fundamental in **building a more competitive agri-food sector**. Working together, we will overcome the challenges that we are facing and forge a more sustainable future for generations to come.

JOSEP USALL I RODIÉ

General Manager of IRTA



ORGANISATION



SCIENTIFIC MANAGEMENT

DIRECTOR
Jordi Garcia-Mas

SCIENTIFIC COORDINATION TEAM
Sara Bover · Maria Devant · Jordi Garcia-Mas



ANIMAL PRODUCTION AREA
AQUACULTURE
Enric Gisbert
ANIMAL WELFARE
Antoni Velarde
ANIMAL BREEDING AND GENETICS
Raquel Quintanilla
ANIMAL NUTRITION
Maria Devant
RUMINANT PRODUCTION
Maria Devant
ANIMAL HEALTH
Natàlia Majó
MARINE AND CONTINENTAL WATERS
Jorge Diogène
SUSTAINABILITY IN BIOSYSTEMS
Ralph Rosenbaum



PLANT PRODUCTION AREA
SUSTAINABLE FIELD CROPS
Marta da Silva
FRUIT PRODUCTION
Luis Asín
GENOMICS AND BIOTECHNOLOGY
Ma. Jose Aranzana
POST-HARVEST
Neus Teixidó
SUSTAINABLE PLANT PROTECTION
Jordi Riudavets
EFFICIENT USE OF WATER IN AGRICULTURE
Jaume Casadesús



FOOD INDUSTRIES AREA
FOOD SAFETY AND FUNCTIONALLITY
Sara Bover
FOOD QUALITY AND TECHNOLOGY
Sara Bover

OUR MISSION

To contribute to the modernisation, competitiveness and sustainable development of the agricultural, food and aquaculture sectors, to supply healthy, quality food for consumers and, in general, to improve the well-being of the population.

OUR VALUES

INTEGRITY

COMMITMENT

RESPECT FOR THE ENVIRONMENT

EXCELLENCE

12% RESEARCH STAFF IN TRAINING

80% IRTA STAFF

73% SUPPORT STAFF

27% R&D PERSONNEL

933 PEOPLE

517 WOMEN 416 MEN

38% STRUCTURAL CONTRIBUTION FROM THE GENERALITAT OF CATALONIA

31% RESEARCH AND INNOVATION PROJECTS

27% CONTRACTS AND SERVICES WITH COMPANIES

4% OTHERS

BUDGET

65,035,921 EUROS IN REVENUE

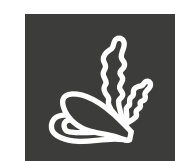
↑ 11.05% COMPARED TO 2022

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STRATEGIC SCIENTIFIC INITIATIVES

In 2023, IRTA continued to work on the five strategic scientific initiatives with the aim of promoting them in a cross-cutting way through the different research programmes. The implementation of these initiatives has not only allowed IRTA to transform traditional food systems into sustainable ones, but has also helped achieve the United Nations Sustainable Development Goals (SDGs).

✓ THESE ARE THE MILESTONES ACHIEVED IN 2023 FOR EACH INITIATIVE:



INCREASING PROTEIN PRODUCTION

Coordinator: Massimo Castellari, researcher in the Food Safety and Functionality programme.

There is a need to respond to the growing demand for protein production, both for human and animal consumption, by incorporating alternative protein sources.



In 2023, the project for the Centre for Innovation in Alternative Proteins (CiPA), the first specialist facility in this field in Spain and Catalonia, was activated. With the mission of contributing to the development of a Catalan agro-industrial ecosystem focused on alternative proteins, CiPA is a key player. This initiative responds to IRTA's strategic priorities, including sustainable protein production and the promotion of foods with alternative protein sources. To boost the CiPA, an investment in infrastructures and staff recruitment was launched, to be completed by 2026.



STRENGTHENING PLANT HEALTH

Coordinator: Cinta Calvet, researcher in the Sustainable Plant Protection programme.

Climate change and globalisation have led to the appearance of new risks to crop health in the form of emerging pests and diseases. To control them, we must urgently find solutions compatible with the reduction of conventional pesticides and plant protection products, which can have negative effects on human health, lead to a loss of biodiversity, and contaminate natural resources.



In May 2023, the Minister for Climate Action, Food and the Rural Agenda, the Hon. Teresa Jordà, opened the facilities of the Plant Health Hub located in the IRTA building on the Lleida Agricultural Engineering campus.

In November, a presentation day was held in the sector, attended by plant protection technicians, pest and disease control product companies and technicians from the Department of Climate Action, Food and the Rural Agenda. At the event, the advances in the fight against emerging pests and diseases were presented and the facilities were visited.



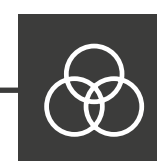
BIOECONOMY

Coordinator: Francesc X. Prenafeta, researcher in the Sustainability in Biosystems programme.

We must continue to move towards an efficient, sustainable and circular economic model based on the use of local and renewable resources that benefit the climate, the environment and human health. To make this possible, a very wide-ranging and interdisciplinary vision integrating biotechnology, digitalisation and the socioeconomics of agri-food systems is required to reduce both food waste and food loss.



In 2023, a collaboration was initiated with the Catalan Waste Agency (Agència de Residus de Catalunya; ARC) to compile a database on the bioeconomic potential of the main bio-resources generated in Catalonia. This database provides useful information on the different possible valorisation routes (agricultural nutrients, bioenergy, co-products for animal/human food, biomaterials, chemical products of biological origin, etc.).



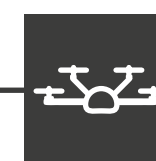
REDUCING THE USE OF ANTIMICROBIALS IN ANIMAL PRODUCTION

Coordinator: Virginia Aragón, researcher in the Animal Health programme.

Increasing antimicrobial resistance and the emergence of new resistance mechanisms are a threat to the health of humans and animals as they diminish the ability to treat infectious diseases.



The different programmes that make up the initiative were involved in the proposal of different actions as part of the European Partnership on Animal Health and Welfare (EUPAHW) of the HORIZON-CL6-2023-FARM2FORK-01-2 (co-financed by EU project 101136346).



IMPLEMENTING SMART AGRI-FOOD SYSTEMS

Coordinator: Joan Bonany, specialist in the Fruit Production programme.

Through digital technologies we can improve the efficiency of farms as well as the environmental and economic sustainability of agriculture, livestock, aquaculture and the food industry.




In 2023, we prepared the AGROLABS DIGITALS proposal, which will be the key IRTA initiative for contributing to the digitalisation of the agri-food sector. AGROLABS DIGITALS includes spaces for testing and experimentation in IRTA centres, as well as the development of a data and service platform for the agricultural and livestock sector.



2024-2027 STRATEGIC PLAN

In 2023, at IRTA, we faced the challenge of rethinking the organisation, initiating an internal process of reflection that has allowed us to visualise where we are heading and what objectives we want to pursue. The drafting of the 2024-2027 Strategic Plan has involved a process of dialogue and active listening with some of our national and international collaborators and benchmarks, with the aim of ascertaining their opinion and vision on the future of the agri-food system and the role of research on it.

We have also benefited from the contribution of several people from IRTA with different professional backgrounds, recognising their experience and their decisive role as key players in the future of the institute. This approach has ensured the participation of a large group of employees/collaborators from different areas and levels within IRTA through thematic work teams focused on each of the following challenges for the future:

5	CHALLENGES 
22	OBJECTIVES 
55	ACTIONS 



CHALLENGE 3 RESEARCH VALORISATION

	
3 OBJECTIVES	7 ACTIONS

We want an IRTA with the effective capacity to bring competitive value to the agri-food sector by promoting innovation.



CHALLENGE 1 SCIENTIFIC OBJECTIVES

	
8 OBJECTIVES	27 ACTIONS

We want IRTA to have the scientific orientation and the necessary means to provide solutions to the challenges facing the agri-food sector in the medium to long term.



CHALLENGE 4 BUILDING ALLIANCES

	
2 OBJECTIVES	5 ACTIONS

We want IRTA to be interconnected with the main agents in the world committed to promoting the agri-food sector.



CHALLENGE 2 INVESTING IN PEOPLE

	
5 OBJECTIVES	11 ACTIONS

We want IRTA to be able to attract and retain the best team of professionals by offering a motivating work environment, oriented to growth and impact.

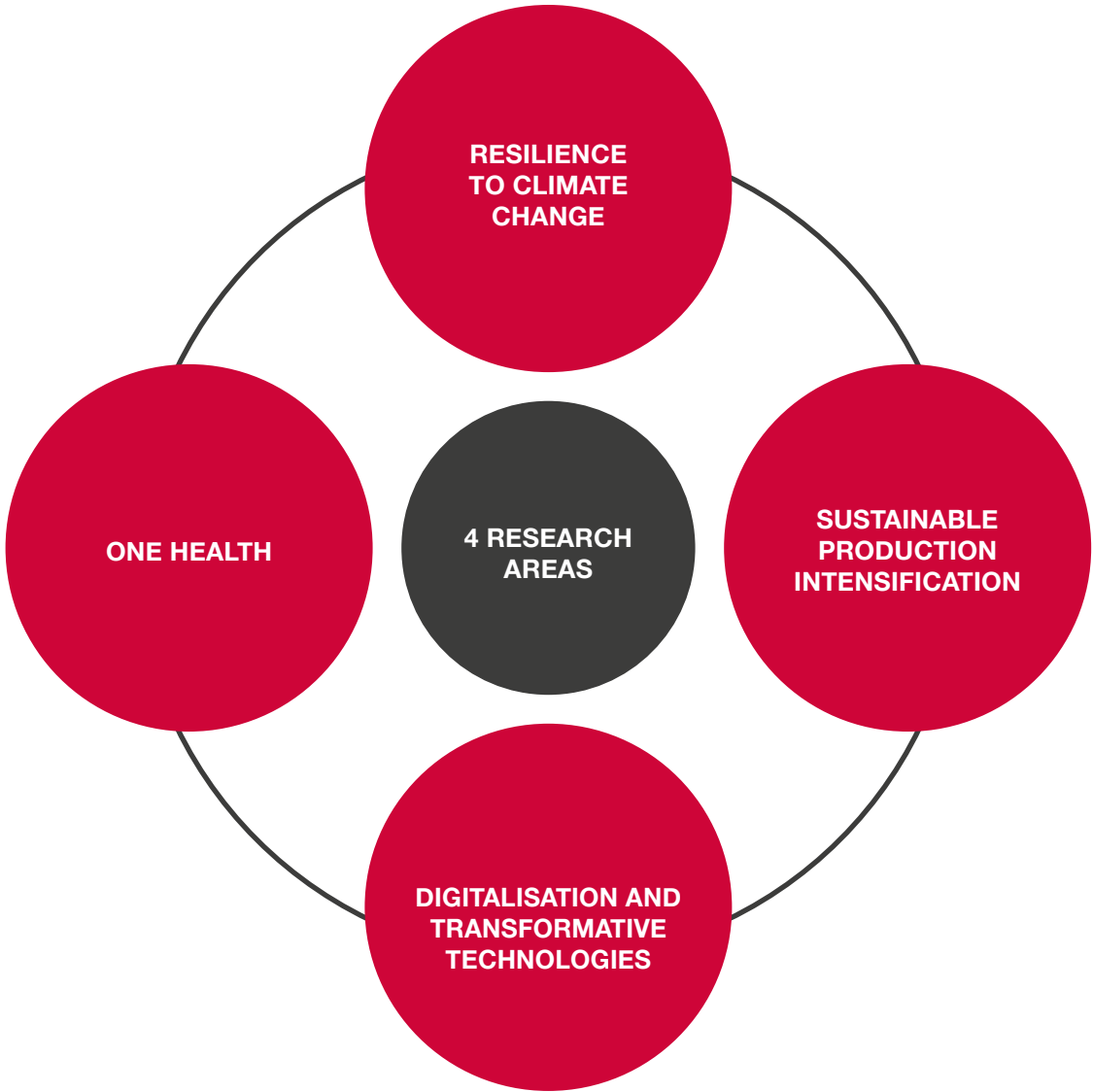


CHALLENGE 5 IRTA AND SOCIETY

	
4 OBJECTIVES	5 ACTIONS

We want IRTA to be in constant communication with society, able to listen to their concerns about the agri-food sector and to provide answers.

In the new 2024-2027 Strategic Plan we focus on four research areas. First, **we will tackle climate change resilience**, addressing water management, reducing carbon emissions and protecting crops in the face of new biological challenges. Secondly, we will drive the **sustainable intensification of production**, prioritising efficient resource management and food sustainability. We will also intensify our **One Health** research, with an emphasis on both animal and plant health, and on managing emerging biological risks. Finally, we will promote the **digital transformation of the sector** and deepen our viticulture research. To this end, we have defined 8 objectives that are not only aligned with the scientific initiatives of the 2020-2023 Strategic Plan but which also support the United Nations Sustainable Development Goals.



1

BOOSTING THE DIGITAL TRANSFORMATION OF THE AGRI-FOOD SECTOR

We will set up the network of digital AGROLABs to address new challenges. We will develop digital twins for fruit orchards, pig farms and food processing facilities, as well as precision tools and platforms for agriculture, livestock and aquaculture.

2

OPTIMISING WATER MANAGEMENT FOR AGRICULTURAL USE

We will strengthen scientific expertise in irrigation agronomy, investigate the use of regenerated water and establish an agricultural support network (RegAssist).

3

IMPROVING CARBON SEQUESTRATION AND SOIL HEALTH

We will investigate carbon dynamics and the impact of regenerative agricultural practices. We will establish a network of experimental plots and create a soil carbon certification programme.

4

PLACING VALUE ON ORGANIC WASTE AND AGRI-FOOD BY-PRODUCTS

We will optimise the valorisation of livestock manure through anaerobic digestion, promote circularity with agri-food by-/co-products and build biogas plants. In addition, we will establish a collaborative network with benchmark industrial plants.

5

BOOSTING THE ALTERNATIVE PROTEIN SECTOR

We will establish the Centre for Innovation in Alternative Proteins (CiPA) in Catalonia. We will boost the production of protein biomass with microbial fermentation, algae and insects, improve plant production and develop technologies to obtain protein ingredients for human and animal consumption.

6

GUARANTEEING ANIMAL HEALTH AND WELFARE IN THE CONTEXT OF REDUCED ANTIBIOTIC USE

We will study strategies to strengthen livestock immune systems, develop on-farm diagnostic tools for a more rational use of antibiotics and explore antimicrobial alternatives.

7

ENHANCING RESILIENCE TO EMERGING BIOLOGICAL RISKS

We will establish epidemiological surveillance systems to anticipate emerging pests and diseases, and develop methods for early detection and diagnosis. We will set up a committee of experts to manage biological risks and improve biosecurity infrastructures.

8

BOOSTING RESEARCH INTO VITICULTURE IN RESPONSE TO THE NEW CHALLENGES FACING THE SECTOR

As the wine sector is essential in Catalonia and IRTA is part of the i4Vi Alliance, we will bolster research into climate change adaptation and mitigation in viticulture and set up an experimental estate.



SCIENTIFIC PRODUCTION

409
SCIENTIFIC
ARTICLES

PUBLISHED IN JOURNALS OF THE
WEB OF SCIENCE CORE COLLECTION

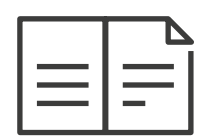
60%
ARTICLES WITH
INTERNATIONAL CO-AUTHORS

75%
ARTICLES PUBLISHED
IN Q1 JOURNALS

27
DOCTORAL
THESES
DEFENDED



7
BOOK
CHAPTERS



27,584
CITATIONS

423
COMPETITIVE
PROJECTS

133
TOTAL IN
CATALONIA

218
TOTAL IN
SPAIN

72
TOTAL
INTERNATIONALLY

ACTIVE
PROJECTS
IN 2023
322
21% started in 2023

121
PROJECTS

132
PROJECTS

69
PROJECTS

GRANTS FOR
RESEARCH
STAFF
101
33% started in 2023

12
GRANTS

86
GRANTS

3
GRANTS

535
CATALAN
CLIENTS

367
CLIENTS OF THE
REST OF SPAIN

205
INTERNATIONAL
CLIENTS

6.4
M€
VALUE OF NEW
BUSINESSES WITH
INTERNATIONAL
COMPANIES

↑73%



47
COUNTRIES ON
5 CONTINENTS

1,625
CONTRACTS WITH
1,107 CLIENTS

SCIENTIFIC NEWS

PLANT PRODUCTION

IRTA brings **new digital technologies to farmers** so that they can optimise the planning of irrigation

The project DIGIREG of IRTA introduces new digital technologies to irrigators for optimal irrigation planning. Using sensors and remote sensing tools on grape, peach, pistachio, almond and orchard crops, data is collected and integrated into a "digital twin" tool. This tool centralises the data and allows simulations to be carried out in a digital environment. The aim is to introduce farmers to digital technologies that improve irrigation management and to remove the barriers that prevent their use. The project demonstrates the effectiveness of digital technologies in irrigation management and promotes their use in a range of crops and geographical areas.



More **efficient and sustainable soil fertilisation** in pasture areas

The RESOL project, promoted by IRTA and the Garrotxa Volcanic Zone Natural Park, works towards the more efficient and sustainable fertilisation of grazing areas. By estimating the nutrients returned to the soil by livestock on extensive farms, the aim is to optimise the use of nitrogen and other nutrients, reducing the environmental impact of over-fertilisation. The study analyses faeces and urine samples from grazing cows in the Garrotxa region to improve fertilisation recommendations. The conclusions of the project will be presented in 2024 at a technical conference of the Department of Climate Action, Food and the Rural Agenda, thereby providing tools for more eco-friendly management and the sustainability of extensive livestock farms.



Studies on **drought in fruit trees** feature in IRTA's Fruit Growing Meeting in Mollerussa

The 28th Fruit Growing Meeting in Mollerussa, organised by the Department of Climate Action and the Rural Agenda (DACC) and IRTA, focused on studies of drought in fruit trees. To better understand how apple, pear and almond trees react to a lack of water, trials were carried out under extreme drought conditions. In this sense, it is highlighted that total fruit removal is the best strategy for guaranteeing the survival of the trees in these scenarios. Other options, such as partial thinning, show limited effectiveness. The results of these studies were shared during the event, which included talks, field visits and trade stands. This event reaffirms our commitment to the sustainable and efficient management of agricultural resources in response to adverse climate conditions.



Irrigators in Lleida can discover the **water needs** of crops thanks to a new **digital platform**

Irrigators in Lleida have access to a new digital platform that predicts the water needs of crops. Developed by IRTA experts, this tool, available since mid-September, offers weekly maps of crop evapotranspiration and water demand predictions. The project, called "COMREG4ET", seeks to modernise irrigation communities and improve water management in a context of climate change. By using satellite imagery and artificial intelligence techniques, crops and their irrigation systems can be identified and land use maps can be generated. This initiative aims to place Lleida at the forefront of new technologies applied to agriculture, facilitating more efficient water resource management.





New guide for promoting **on-farm composting** of livestock manure

IRTA and the Directorate General of Agriculture and Livestock, with the support of the Waste Agency of Catalonia, have created a Guide for the on-farm composting of livestock manure, within the framework of International Compost Awareness Week (ICAW). This publication shows how to convert compost into an excellent alternative for fertilising fields and largely replacing the use of synthetic fertilisers. It also helps the sector to move towards more efficient production with organic fertilisers, preserving and improving soil health.

The first report on the **conservation status of wild pollinators** in Catalonia and their threats is presented

It has been published the first report on the state of wild pollinators in Catalonia, which analyses their status, threats and priority areas of action for conservation. Coordinated by the Department of Climate Action, Food and the Rural Agenda and CREAF, with the participation of various institutions, the report notes a significant decline in the diversity and abundance of bees, butterflies and hoverflies. It points to habitat loss, agricultural intensification, urbanisation and climate change as the main causes. The report also proposes a cross-sectoral strategic plan for pollinator conservation to reverse this situation, including actions such as restoring agricultural and forest habitats, reducing the use of pesticides and raising public awareness. The aim is to maintain the functionality of agricultural ecosystems and guarantee the pollination service to ensure food security.



IRTA trains the team at 'El Celler de Can Roca' on high quality oils

The staff of the 'El Celler de Can Roca' restaurant received training from IRTA on high quality oils. Researcher Agustí Romero and technician Montserrat Jiménez addressed the uses of oils both in the dining room and in the kitchen in high-end restaurants. They encouraged an understanding of the sensory and technological characteristics of oils. In addition, a survey was carried out to understand the criteria for the use of oils in the HORECA sector in Catalonia.



Annual meeting of the **LocalNutleg** project held in Rennes

On 3 and 4 May, the members of the Local-Nutleg project held their annual meeting in the city of Rennes, France. The leaders of each working group presented the main results of the project so far. In addition, the French National Institute for Agricultural, Food and Environmental Research (INRAE), one of the project partners, offered a culinary workshop. In this workshop, the LocalNutleg team prepared both savoury and sweet recipes together with chefs from the Rennes culinary centre, using ingredients related to the project (pulses and dried fruits) and other additional ingredients. The resulting dishes were tasted by all the participants.

IRTA presents a new almond-peach rootstock **"adapted to modern times"** at the Fruit Logistica fair

Once again, IRTA participated in the international Fruit Logistica fair, held in Berlin. There, IRTA-PRODECA presented a new almond-peach rootstock, called INTENSIA, at their stand. Xavier Miarnau, an IRTA researcher specialising in almond trees, described it as "a rootstock adapted to modern times". This adaptation responds to changes in the almond sector, where the priority has shifted from the vigour of varieties to productive efficiency. Now farmers are looking for trees that consume less water, are adapted to Mediterranean soils and drought tolerant. The key, therefore, lies in the variety-rootstock combination. The new rootstock has been developed especially for intensive and super-intensive plantations, reflecting the current demands and trends in the sector.



ANIMAL PRODUCTION

A pilot project confirms the viability of macroalgae farming in the Ebro delta bays

Pilot tests on macroalgae farming in the Ebro delta and at IRTA's facilities suggest that commercial production could begin in 2024. This option, explored at a conference organised by the Department of Climate Action, is seen as a favourable diversification of traditional aquaculture crops. The results have also led to the drafting of a guide for future growers, promoting sustainability and food security.

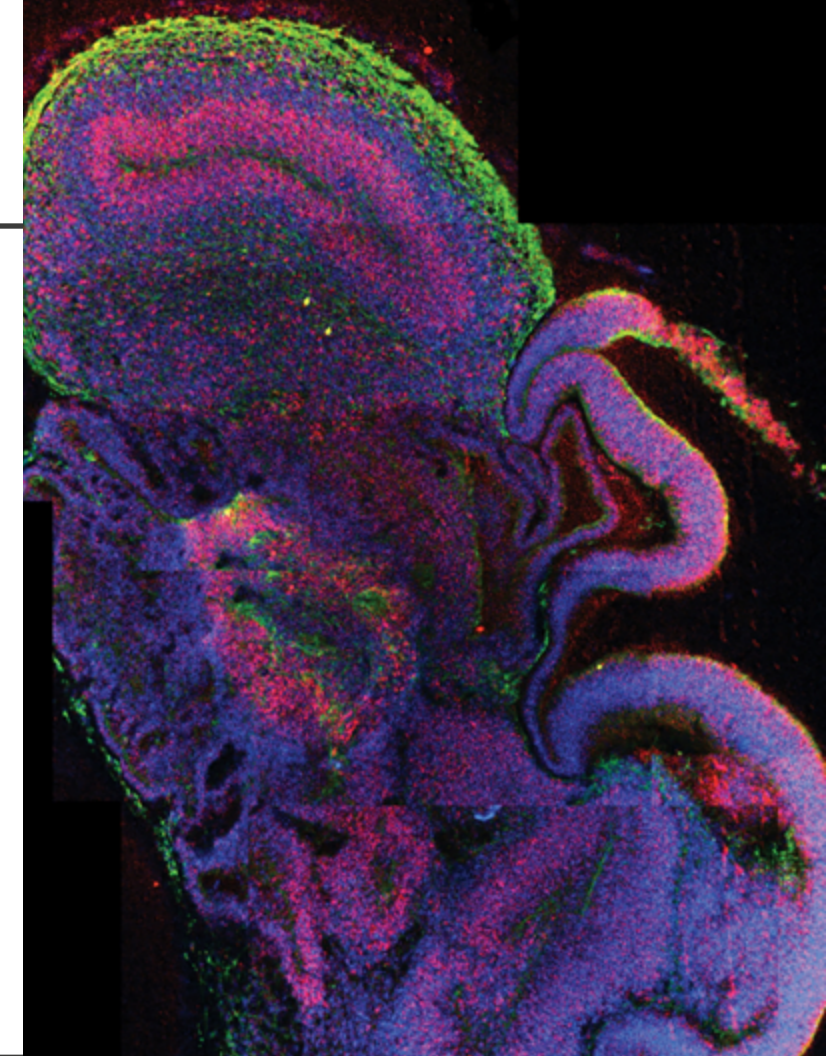


The aquaponic system NewTechAqua wins the MedFish4Ever award for innovative practices in aquaculture

The saltwater aquaponic system of the European project NewTechAqua, developed by IRTA, has won the MedFish4Ever award for innovative practices in aquaculture. This system combines aquaculture and hydroponics, allowing the simultaneous cultivation of plants and fish, with the fish providing nutrients for the plants and the plants cleaning the recycled water. IRTA has designed a promising system to grow red mullet together with samphire, a salinity-tolerant plant. This system stands out for its low costs, minimal electricity consumption and simple design, adaptable to various aquaponic models. The award was collected at the MedFish4Ever Conference in Malta, where actions for a sustainable future in the fisheries and aquaculture sector were discussed. Representatives from 20 countries were present at the event, organised by the UN Food and Agriculture Organisation (FAO) and the European Union.

The first farm animal organoid biobank in Spain will be installed at IRTA

IRTA is spearheading the FARMBANK project to create the first farm animal organoid biobank in Spain. This biobank, located at IRTA-CReSA, will allow research into infectious diseases without using live animals. Organoids from pigs, chickens and ruminants will be recreated for research into diseases and the development of vaccines and treatments. The project is supported by IrsiCaixa, BSC-CNS and PharmaMar and promises a more ethical and sustainable future for biomedical research.



The IRTA and UAB consortium, a national reference centre in Spain in terms of animal welfare in livestock and aquaculture

IRTA and the UAB have been named a national reference centre in animal welfare by the Ministry of Agriculture, Fisheries and Food for two years. The main objective of this consortium, led by IRTA, is to provide scientific and technical advice to public authorities on animal welfare, ensuring the implementation of relevant European legislation. It will also be responsible for providing up-to-date and reliable data, carrying out research in this area and providing support in key areas such as advising at meetings of the European Food Safety Authority (EFSA) on animal protection. This initiative responds to the growing need to improve animal welfare on farms and to facilitate the animal welfare monitoring work of the competent bodies.



An IRTA and Mafrica project wins the **Innovation Award** during Bioenergy Night

IRTA and Mafrica were recognised during the 1st Bioenergy Night for their innovative project to generate biogas using waste from a pig slaughterhouse. This award highlights the project's contribution to the decarbonisation of the Catalan economy. It is aimed at valorising animal by-products and slaughterhouse waste through the production of biogas. Belén Fernández, the researcher in charge of the project, highlighted the contribution of Anna Otero and the team in gaining this recognition.



COVID-19: from emergency research to a **consolidated area of study**

After more than three years of the COVID-19 pandemic, emergency research has become a consolidated area of study. Through the CBIG consortium, created by IRTA-CReSA, IrsiCaixa and the Barcelona Supercomputing Center, joint projects were developed to address the crisis. The research has led to effective antiviral drugs such as plitidepsin, while other possibilities, such as hydroxychloroquine, were rejected. In parallel, vaccine prototypes were designed and neutralising antibodies were monitored in the population. Research has also been undertaken on which animals are susceptible to infection by the virus. All this work, carried out in record time, required not only scientific knowledge but also complex logistical solutions, including the setting up of new laboratories and close collaboration with other research institutes.



Júlia Vergara-Alert, IRTA-CReSA researcher, receives the 2022 **National Young Talent Research Award**

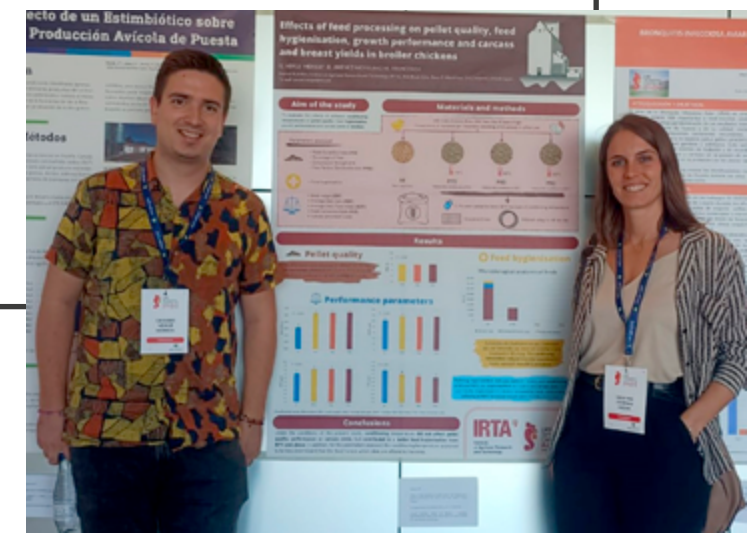
On 20 June, the 2022 National Research Awards ceremony was held at the Teatre Nacional de Catalunya. At this event, Julia Vergara-Alert, a researcher in IRTA's Animal Health programme, was awarded the 2022 National Young Talent Research Award. The award was presented by the President of the Catalan Government, Pere Aragonès, and the Catalan Minister for Research and Universities, Joaquim Nadal. Vergara-Alert was recognised as the top Catalan researcher in the field, under the age of 40, in terms of career and scientific achievements in 2022.

The Poultry Scientific Symposium awards **3 prizes to IRTA researchers**

The 58th Poultry Science Symposium, organised by the Spanish Poultry Science Association (AECA), took place from 4 to 6 October in Ávila. The event brought together more than 400 poultry professionals, making it a key space for knowledge exchange.

The researcher Cristina Zomeño, from the Food Quality and Technology programme, won the first prize for the Best Scientific Poster Communication with the work entitled "Classification of breast myopathies in commercial broilers by a physicochemical assessment and multivariate data analysis".

Gerard Verge and Beatriz Jiménez, from IRTA's Animal Nutrition programme, received several prizes, including third prize for Technical Photography with "The heart of nutrition" and first prize for Best Artistic Photography with "Catacregg" in the Photography Competition "Poultry farming and its environment".



FOOD INDUSTRIES

Flour and bread 'made in' Girona, an exemplary model of quality local products

The projects "It's Flour from Girona" and "Bread of the Tramuntana", promoted by IRTA and the Guild of Artisan Bakers in the Girona Region, are trying to overcome the decline in the number of artisan bakers and differentiate their products from industrial bread. Despite the low production in 2023 due to unseasonal rainfall, the project continues to be an exemplary model of quality local products. Working with four varieties of wheat grown on 300 hectares, they offer a combination that guarantees the best quality bread. In addition, "Bread of the Tramuntana" (Pa de la Tramuntana), made from ancient varieties of wheat, has a distinctive aroma and is made using sustainable agricultural practices. With the support of consumers and adaptation to climate conditions, the project promotes local, high-quality and sustainability in the Catalan food sector.



IRTA co-organizes the 5th Congress of the Spanish Association of Sensory Analysis Professionals (AEPAS)

IRTA co-organised the 5th Congress of the Spanish Association of Sensory Analysis Professionals (AEPAS) in Girona from 19 to 21 June. The organising committee, comprising researchers from IRTA's Food Quality and Technology programme, directed the event, which included the participation of Jordi Garcia-Mas, the scientific director. The congress offered workshops and sessions on sensory sciences, exploring the perception of food through all five senses. IRTA is at the forefront of this field, developing methods such as the Official Tasting Panel for Catalan Wines. Several presentations addressed topics such as semiotics in food labelling and the use of natural language processing in the study of social media users' perceptions of food products.



For the first time, the European Research Council subsidises an IRTA project to identify **drought-resistant forms of agriculture**

In 2023, Catherine Preece, a researcher in IRTA's Sustainability in Biosystems programme, received an ERC consolidator grant for the WILD-ROOTS project. This grant, announced in November, will allow the study of crop roots and their wild ancestors to identify new forms of drought-resistant agriculture. The project represents an important step towards agricultural sustainability in a context of climate change.



HIGHLIGHTS...

IRTA achieves **the highest rating** in the **CERCA** assessment

In 2023, IRTA was recognised with the highest rating in the CERCA evaluation, consolidating its position as one of Catalonia's 40 research centres of excellence. This success is the result of the dedication of IRTA's researchers, research team members and corporate services.

As part of the CERCA system (Centres de Recerca de Catalunya), IRTA forms part of this network of institutions that carry out research in various fields of knowledge. Its operation and activities are periodically evaluated by a team of renowned independent experts, who review the centres every five years.

The evaluation committee assessed IRTA's progress, the degree of compliance with the recommendations made in the previous evaluation, scientific production and management during the period evaluated, awarding IRTA the highest grade (A).



KNOWLEDGE TRANSFER

2023 has been a successful year for IRTA, as the IRTA open repository (open access) was launched in relation to technical publications, increasing the total number of publications in sectoral journals and web portals by more than 150% compared to 2022.

Particularly noteworthy was the nationwide organisation of the GENVCE conference in Sucs (Lleida), which demonstrated IRTA's capacity and strength to organise events of this magnitude and complexity, despite the difficulties resulting from the drought.

The Transfer Office continues to **innovate new formulas and formats** for transferring knowledge. In 2023, we launched a pilot project to send newsletters before and after the most important conferences and courses, increasing the graphic and audiovisual production. One highlight is the incorporation of the podcast format as a feature with promising future prospects and great potential for impact.

This year, we also analysed and **added value to the indicators requested from the participants in the activities**. According to the Net Promoter Score (NPS), IRTA has obtained an overall rating of:

+55%
♥ NET PROMOTER SCORE (NPS) GLOBAL

OUTSTANDING ACTIVITIES IN EACH AREA

👤 Attendees

♥ Net Promoter Score (NPS)



👤 **793** ♥ **+51%**
XXVIII Fruit Growing Meeting, Mollerussa



👤 **519** ♥ **+50%**
GENVCE



👤 **61** ♥ **+58%**
We compete together



👤 **101** ♥ **+60%**
Animal Welfare seal

726
ACTIVITIES
ORGANISED



44,654
ATTENDEES

76%
On-site

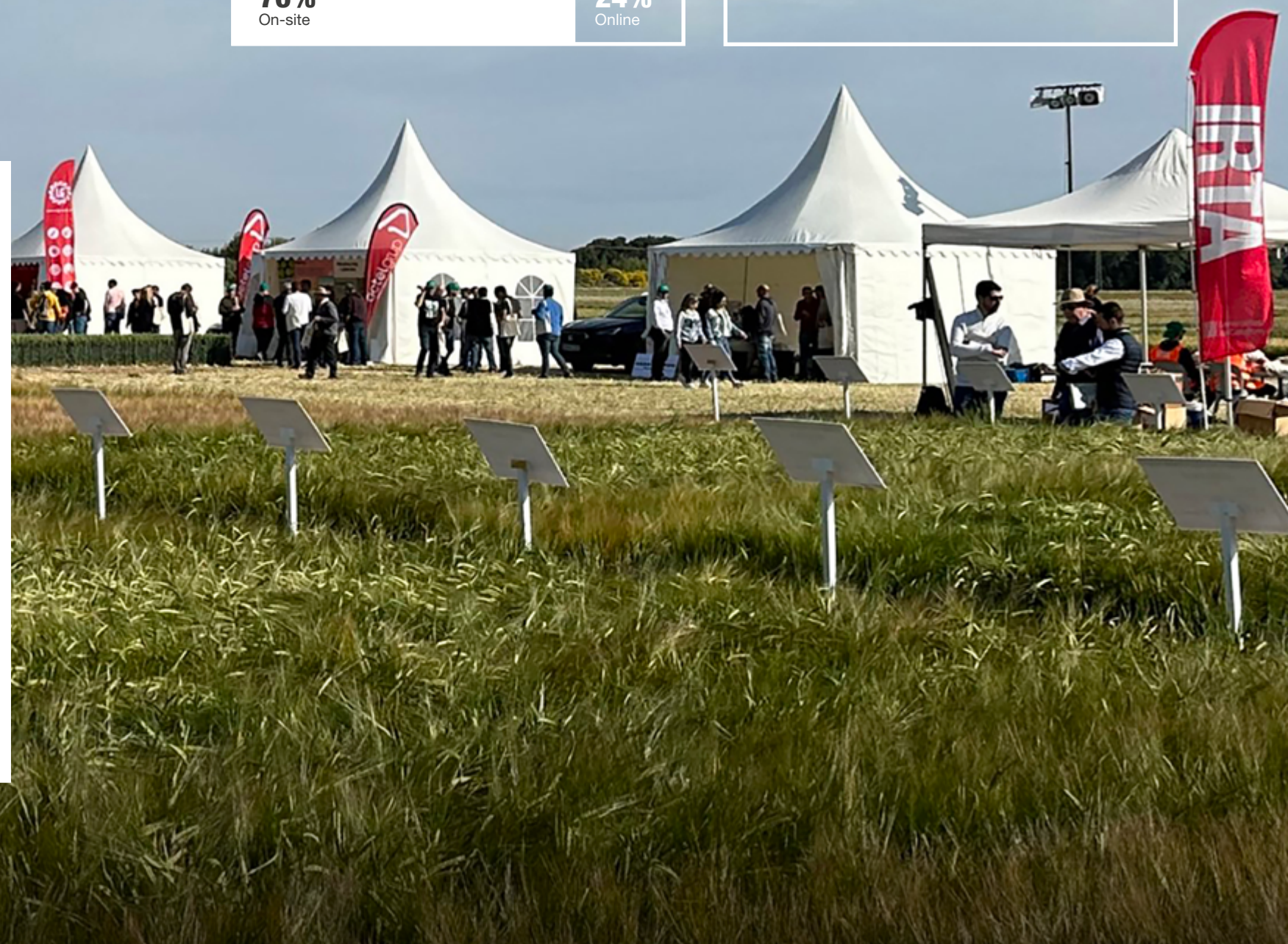
24%
Online

PORTAL TRANSFERENCIA.IRTA.CAT

>12,700
REGISTERED USERS
101,013
VISITS



226
TECHNICAL
PUBLICATIONS



INDUSTRIAL PROPERTY

IRTA applied for:

3 NEW PATENT REGISTRATIONS

2 NEW PLANT VARIETIES

IRTA has:

14 PATENTS (8 HAVE BEEN LICENSED)

65 PLANT VARIETY REGISTRATIONS



Tutti, a new variety of apple adapted to hot climates

The Tutti apple, the commercial name of the HOT84A1 variety, is the fruit of more than 20 years of work in variety improvement, and more than 100,000 potential varieties evaluated. It is the result of the Hot Climate Partnership breeding programme, which aims to obtain fruit varieties adapted to hot climates; a collaboration programme between the Plant & Food Research centre in New Zealand, Fruitfutur (the association of the main fruit producing companies in Catalonia: Nufri, Actel, Fruits de Ponent and IGP Poma de Girona), and IRTA.

Tutti was presented at the 2023 Fruit Logistica fair in Berlin, Germany. During the year, it went on sale, still with small harvests and under the variety code, but there are already 100 hectares planted and it is hoped to double the surface area in the near future. It will also start to be marketed under its commercial name.

The Innovation Arena at Alimentària FoodTech focuses on technological innovation

The Alimentaria FoodTech 2023 trade fair showed its commitment to start-ups with the creation of the FoodTech Innovarena, an innovation space promoted by IRTA's Valorisation Office. This space was dedicated to technological innovation, and included a stage for presentations, as well as the Startups Area, with the aim of facilitating meetings between industry players, start-ups and researchers. The activities organised by IRTA enriched the overall programme, addressing specific industrial challenges, especially those centred on sustainability, and included the participation of brands such as Ametller Origen, Danone, Boadas 1880, Nestlé, Conserves Ferrer and Lluçà Vegetals. Of particular note were the innovations presented by the participating start-ups, some of which have already established themselves in the market, such as Cooling Photonics, Cofling, ColorSensing, Alquímia, Aeris, Planet Biotech, Bioblaug and Lobelia Earth, while others presented emerging technologies.



The X_Agritech network is set up to promote the transfer of R&D&I in the agri-food sector in Catalonia

X_Agritech, created in January, is a valorisation network that aims to boost the transfer of research and innovation in agriculture and livestock farming in Catalonia. Directed by IRTA and financed by AGAUR, it brings together 31 research groups from various organisations. Its purpose is to leverage technologies for practical applications in the production sector, with a focus on sustainability, genetic improvement, artificial intelligence and data science.

It promotes collaboration between research groups, clusters and companies to address challenges such as business competitiveness and reducing the carbon footprint. X_Agritech also encourages disruptive solutions and supports the adoption of technology in the sector, as well as promoting entrepreneurship and jobs in the rural world. Strengthening participating organisations and improving technology transfer are other key objectives.

INSTITUTIONAL RELATIONS

2023

3 FEBRUARY

IRTA holds the first Institutional Round Table with stakeholders from Barcelona and the surrounding area to listen to their research and innovation needs and concerns.



10 FEBRUARY

IRTA participates in the international Fruit Logistica fair held in Berlin and presents INTENSIA, a new almond-peach rootstock.



13 FEBRUARY

The president of the Danish Technological Institute (DTI), Joan Farré, visits IRTA Torre Marimon.



5 JULY

The Catalan Minister of Research and Universities, Joaquim Nadal i Farreras, visits IRTA Torre Marimon to learn about the priority areas of research. Nadal highlights IRTA's key role in supporting the agri-food sector and improving public welfare.

12 JULY



The President of the Government of Catalonia, Pere Aragonès, visits IRTA's Experimental Farm in Mollerussa to learn about the actions being carried out to monitor drought, as well as a project on regenerative agriculture, financed by the Climate Fund.

3-5 OCTOBER

IRTA participates in the 15th edition of Fruit Attraction, one of the key international fairs for the fruit and vegetable sector.



SEPTEMBER

20 OCTOBER

The Catalan Minister for Climate Action, David Mascort, presents the highest award, the so-called 'Golden Pig with Diamond', during the 30th anniversary of the Porc d'Or de Capa Blanca Awards held at the La Llotja Conference Centre in Lleida.



2024



SOCIETY

As a public research institute, we have a responsibility and obligation to share the knowledge we produce with the community, not only for transparency, but also to promote scientific understanding in society and to foster the critical thinking that facilitates informed decision-making. That is why we continue to participate in a variety of activities aimed at the general public.

IRTA's women scientists take science to Catalan schools

On 10 February, more than 500 female researchers from all over Catalonia participated in #100tífiques, an event organised by the Catalan Foundation for Research and Innovation (FCRI) and the Barcelona Institute of Science and Technology (BIST) to commemorate the World Day of Women and Girls in Science. IRTA was represented by more than 30 women scientists who shared their experiences in primary and secondary schools, sparking interest in science and gender equality in this field.

From rural areas to urban centres, IRTA's women scientists travelled to a large number of Catalan municipalities, including locations in the west, Terres de l'Ebre, Girona, Baix Empordà, Barcelona and other regions. With topics such as fruit growing, genomics, food quality and animal health, they captivated the students' attention and motivated them to explore the world of scientific research.

Through this initiative, IRTA played a key role in promoting science among young people in Catalonia, contributing to the visibility of women in this field and inspiring future generations of female scientists. It also consolidated its commitment to scientific outreach and gender equality, bolstering its reputation as a leader in the Catalan scientific community.



Open days and outreach in Lleida and Tarragona

On 6 October, IRTA Fruitcentre held an Open Day in Lleida, to mark European Research Night and the centre's 10th anniversary. The public was able to participate in workshops on activities including almond trees, fruit valorisation and genomics, among others.

In addition, at the end of November, IRTA La Ràpita (Tarragona) celebrated World Aquaculture Day with informative talks on marine aquaculture and sustainability, with attendees from the Polytechnic University of Catalonia (UPC) and the Institute of Professional Aquaculture and Environmental Studies of Catalonia (IEPAAC). Visitors also enjoyed an open day to see the centre's facilities, including a biosafety building and a vivarium.





IRTA promotes **science** at local festivals

IRTA staff actively participated in various science outreach festivals held in early June 2023.

At the Festa de la Ciència de Barcelona, two IRTA Mas Bové technicians organised a workshop on animal nutrition, while at the Festa dels Menuts at MonNatura Delta, staff led workshops on food webs in delta ecosystems.

In parallel, IRTA had a prominent presence in the Pint of Science, with several researchers giving talks in bars and restaurants in Tortosa, Amposta and Barcelona on topics such as olive growing, sexual reproduction in animals and marine toxins.

This intense week of scientific dissemination allowed IRTA to connect with a wide audience and share knowledge on topics that are important for society.



120
NEWS ITEMS
PUBLISHED ON
THE WEBSITE

146,210
VISITS TO THE WEBSITE
336,750
PAGES VISITED

1,638
APPEARANCES
IN THE MEDIA



71
PRESS
RELEASES
AND CALLS
SENT

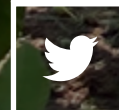


41,850
followers



↑ 25%

13,392
followers



↑ 5%

4,596
subscribers



↑ 13%

3,850
followers



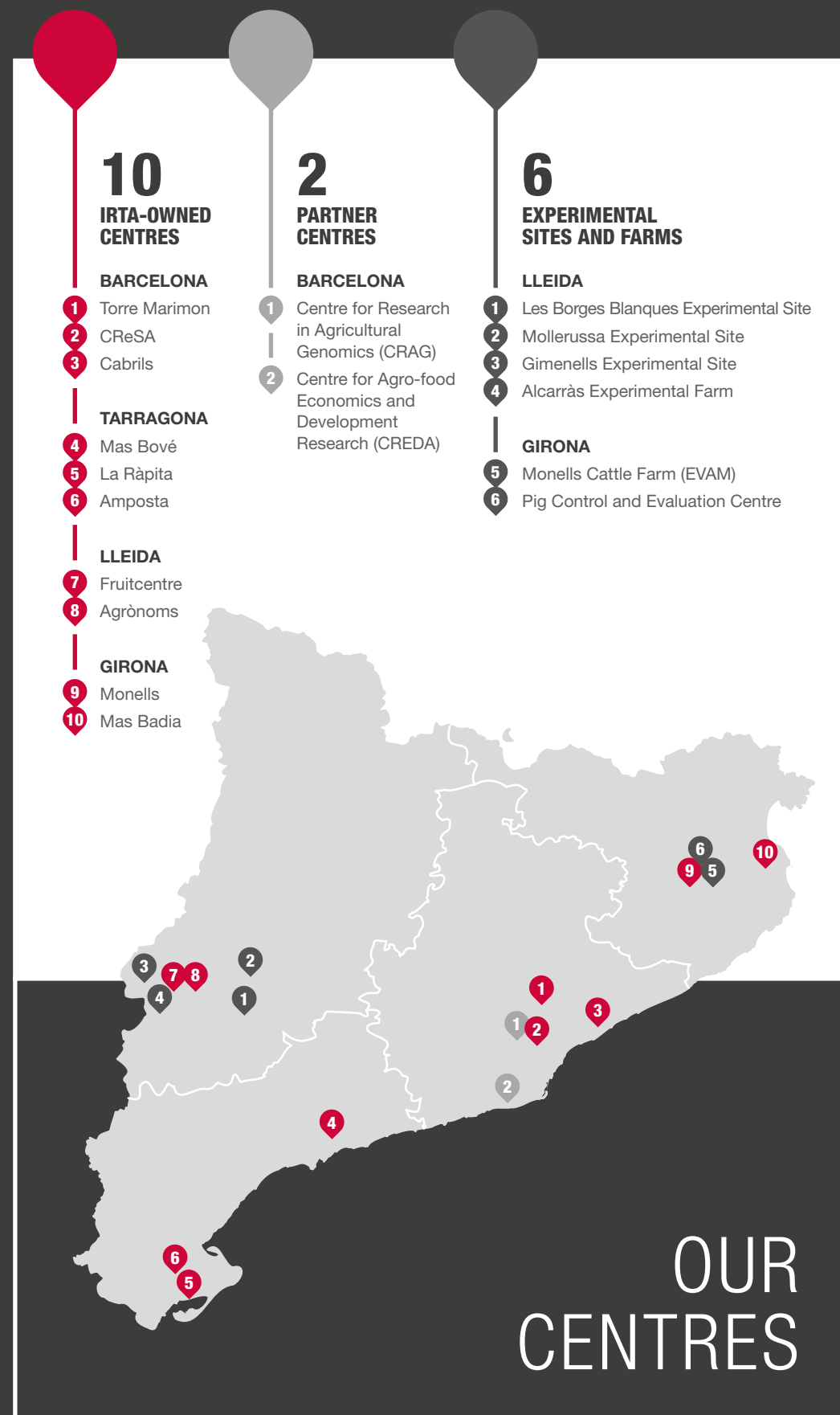
↑ 16%

2,655
followers



↑ 70%

OUR IMPACT ON SOCIAL
MEDIA IS INCREASING,
BROADENING OUR
OUTREACH AND WIDER
AUDIENCE.



IRTA^R

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