

Establishing the first national Gene Bank for the conservation of indigenous and endemic plants in Malta

CAP funds Maltese food security through its first national Gene Bank.

EAFRD-funded projects

Location: Attard, Malta

Programming period: 2014-2020

Priority: P4 - Ecosystems management

Focus Area: Biodiversity restoration, preservation & enhancement

Measures: M10 - Agri-environment-climate

Funding:	Total budget	855 545 (EUR)
	EAFRD	641 659 (EUR)
	National/Regional	213 886 (EUR)

Timeframe: 26/05/2020 - 30/06/2024

Project promoter: Plant Protection Directorate

Email: plantprotection.mafa@gov.mt

Summary

This food security project aimed to address the absence of a national gene bank for plant genetic resources in Malta. Activities included constructing a dedicated facility, acquiring necessary furniture and equipment, providing staff training, and developing communications material.

Project results

- > The project successfully established a fully functional gene bank which supports food security and better climate change resilience by better conservation of agriculturally important landraces, and better research advancement. It is a strategic investment in the preservation of plant genetic resources for the benefit of present and future generations.

Key lessons and recommendations

- > Improving the protection of food supplies relies on optimised agri-science and related resources.
- > Efficient project administration is crucial for success, but having the right group of experienced experts on the team is also essential.



© Ministry of agriculture, fisheries and animal rights

- > Communication is key for project success, particularly when many contractors are involved. It is important to establish sufficient methods for project monitoring.

Context

The Plant Protection Directorate of the Maltese Ministry for Agriculture oversees plant health and pest control, as well as imports and exports of plant reproductive material in the Country. It also enforces EU Directives and Regulations by issuing legislation for trade control. In 2016, the Directorate took on responsibility for genetic resources, acting as the Competent Authority for the Nagoya Protocol on Access and Benefit Sharing emanating from the use of genetic resources, as well as the International Treaty on Plant Genetic Resources for Food and Agriculture. At the time of application to the EU, Malta lacked a national gene bank for the management of plant genetic resources.

Given the Plant Protection Directorate's role as the manager of plant genetic resources, the construction of a gene bank was imperative. Establishing it within an ex-situ conservation laboratory that had recently been set up (the micropropagation laboratory) means that one complements the work of the other.





© Ministry of agriculture, fisheries and animal rights

This is especially valuable considering the limitations of the original laboratory, which has limited germplasm storage capacity and a lack of dedicated equipment and infrastructure.

For this reason, the gene bank was conceived of as a national reference point for the conservation of plant genetic resources, particularly those agriculturally important landraces that, at the point of project commencement, did not benefit from conservation management and protection at the national level. The facility was required to act as an ex-situ conservation infrastructure and a state-run facility for the conservation and valorisation of such varieties.

Objectives

The project aimed to:

- establish a national gene bank in Malta to conserve agriculturally important local plant varieties.
- foster research and innovation in plant breeding, plant biochemistry and genetics.
- help mitigate climate change impacts and slow down biodiversity loss by studying indigenous flora.
- expand ex-situ conservation beyond existing limitations.
- provide educational resources.
- serve as a long-term investment in preserving plant genetic resources.

Activities

The Plant Protection Directorate was the beneficiary and the sole project leader. Project activities implemented include:

- constructing the gene bank building: this component involved a State-funded construction phase in which a new dedicated facility was built to address the exigencies of germplasm storage rooms and laboratories. This component also involved an RDP-funded phase involving the design and installation of dedicated automated infrastructure for the establishment of temperature and humidity controlled repositories, a supply of purified water for the laboratory, and a centralised building management system for its 900 m² area.
- acquiring dedicated laboratory furniture: purchasing four laboratories, four dedicated storage rooms, and a plant museum. Each facility required a set of furniture and infrastructure, including laboratory benches and storage cabinets, chemical storage compartments, seed storage units, display cabinets, library shelving, office desks, etc.
- providing genomic services: The gene bank aims to improve genetic studies on Maltese plants. As such, part of the funding was allocated to the sequencing of two Maltese endemic plants, in a world first, using state-of-the-art technology.
- acquiring laboratory equipment and tools: the gene bank's labs are divided into molecular labs and seed cleaning labs. These require dedicated equipment for the extraction and purification of biochemicals extracted from plants (e.g. DNA, antioxidants). The equipment acquired includes items used for electrophoresis, a gel scanner, nucleic acid quantitators, a homogeniser, a UV spectrophotometer, various centrifuges, and a fume hood, to name a few. The seed lab required specialised equipment such as germinators, seed counters, hygrometers, a dehydration cabinet, and an autoclave. Part of the facility includes also storage rooms, scientific freezers, and basic laboratory tools (glassware, utensils, aluminium storage bags, etc).
- providing training: part of the project involved a specialised training phase in exsitu conservation techniques for three members of staff to be able to make the most efficient use of the resources available at the gene bank so that it becomes operational with as little time lag as possible.
- creating communication materials: various print materials were created for distribution to the public as well as for permanent display in the plant museum to meet the aims of this component of the project. The information posters, booklets, and bookmarks sought to raise awareness and inform the public about the importance of ex-situ conservation, and the valuable role that the new facility will play in sustaining biodiversity and agriculture.





© Ministry of agriculture, fisheries and animal rights

Main results

- The investment set up a facility (building and infrastructure) dedicated to the conservation of Maltese indigenous plant germplasm.
- 35 869 agri-science items were acquired.
- 12 information posters on permanent display were created, together with 9 000 information booklets, and 10 000 bookmarks featuring Maltese plants. The main target for these materials is the general public (including schools via the botany museum), and the scientific community. This latter group will store herbaria and seeds, at lower levels, and will carry out research to discover the potential of local plant genetic resources.
- The elucidation of the whole genome sequences of two Maltese endemic plants: Maltese Rock Centaury (Malta's national plant, with some medicinal properties), and the Maltese Yellow Kidney Vetch, an endemic wild relative of the Common Kidney Vetch, also known for its medicinal properties. Thanks to collaboration with a local academic, there are hopes of extracting meaningful insights from the acquired sequences that will contribute to a more comprehensive understanding of the species in question.
- The project will serve as the focal point for plant genetic resources for both wild flora and agriculture. At least three new scientific posts will be created in the near future.

Key lessons

- Improving the protection of food supplies relies on optimised agri-science and related resources.
- Communication is key for successful project execution, particularly when many contractors are involved.

- It is important to establish regular meetings with contractors to monitor and control progress closely.
- Carrying out market research and understanding the tools and technologies available, as well as speaking with experts in the field who can provide guidance, will help teams make the right decisions and save time in the long run, particularly when dealing with a project that requires a multidisciplinary approach.
- The involvement of experts is essential at the planning stage, particularly for the design of tailor-made solutions, but also for drawing up technical specifications for equipment.
- Efficient project administration is crucial for success. Tasks like tender production, publication, evaluation, procurement, execution, and reconciliation can be overwhelming for a project as large as this.
- Terminating a contract early based on poor performance can save money, stress, and time.
- Many European experts will happily collaborate and provide valuable insights about the project, particularly if the project can benefit from overseas expertise in areas that nowadays are very well established.
- A project manager should assess the capabilities within the team and explore opportunities for utilising existing skills and knowledge to fulfil project requirements economically.
- A project manager should not hesitate to use internal resources to achieve cost savings and efficiency gains.

Additional information:

Project information



Funded by
the European Union

