Ministry for Rural Affairs
and the Environment

AGRICULTURAL BIOLOGY LABORATORIES

Entomology, Mycology and Nematology

The above-mentioned laboratories are responsible for the diagnosis of plant diseases, for the identification of plant pathogens and plant pests brought either by the general public, by registered growers, by PBC personnel and by direct inspections carried out by our unit. Depending on the identification results, control measures are suggested to growers. The labs are also responsible for the identification of living organisms (insects, fungi, nematodes and mites) intercepted by plant quarantine inspectors.

Number of samples examined	382
Number of tests carried out	539
Number of inspections	241

Highlight of main activities

- A new plant disease on greenhouse tomatoes-Forl
- Towards the end of 2004, a new pathogen attacking greenhouse tomatoes was found in the Northern parts of Malta. A semi-popular article was also published in '*Biedja u Sajd'* so as to alert tomato growers of this disease.

A new plant disease on potatoes – Extreme case of powdery scab

A case of extremely severe powdery scab was first observed in Qrendi. On the tubers of cv Derby, symptoms were so severe and characterised by an impressive proliferation of tissues of the tuber, followed by black rot, that a case of black wart disease was suspected. Action was taken so that potatoes in the affected fields were burned and growers are now obliged to grow wheat for at least three years. Compensation to the said growers was also provided by MRAE.

Plant health status at SVDP

In February a *Cladosporium* sp. (probably *C. carpophylum*), was isolated from GF 677 (SVDP Nursery) showing leaf spots and shootholes and rotting of the stem around buds. The isolate, when spray-inoculated on young GF 677 plants, has induced foliar symptoms.

Plants of GF 677 and Myrabolan produced in vitro at the Plant Biotechnology Centre were found infected with *Thielaviopsis basicola*. It was suggested to drench/treat the soil with Benzimidazole fungicides (for example, Methyl thiophanate) as was carried out last year and in which good results were obtained. New fungicides should be tested to improve the control of *T. basicola* at PBC and at SVDP.

Surveys

The annual survey for *Phytophthora ramorum* was carried out and forwarded to the Commission. All visual inspections and laboratory tests on suspect samples were negative for *P. ramorum*. The annual survey for the Pine Wood Nematode was also carried out but results were not yet forwarded to the commission. The annual survey for the Colorado Beetle was also carried out and results forwarded to the Commission.

Quarantine pests and diseases

During an inspection carried out at a greenhouse having ornamentals, symptoms of White rust (*Puccinia horiana*) were observed on leaves of chrysanthemum. White rust is a quarantine disease which needs to be notified and measures need to be taken for its eradication.

Visits by Foreign Specialists and University Students

- During 2005, a master level student at IAM-Bari, Italy continued using the facilities of the labs and prepared more than 60 working samples of soil for further analyses aimed at detecting *Verticillium* spp.
- In the last week of March, Dr Yair Ben-Dov, a world specialist of scale insects was in Malta and some field trips were arranged to identify major scale insect pests of Malta and suggestions were provided on how these can be controlled.
- A visitor from the Institut Supérieur d'Agriculture de Beauvais in France was involved in a training period within our labs from 25 July till 10 November. She was involved in various disciplines such as laboratory tests, field inspections and diagnosis of plant pests and diseases.
- An Agricultural Diploma student conducted research work on potato diseases found in the Maltese Islands for his diploma dissertation. He concluded his work with a dissertation entitled *Fungal Pathogens of the Winter-planted Potatoes in Malta - A Review and Field Survey*.
- A Diploma University student at the Institute of Agriculture performed research work on quality of Maltese honey. This work was partially carried out at the University of Bari in Italy where chemical analysis were carried out. She concluded her work with a dissertation entitled A basic study on *Quality of Maltese Honey*.
- An MSc University student is carrying out work at the above labs on the identification of pollen in Maltese Honey, as part of her MSc thesis.

Publications

The following work relating mainly to agricultural pests and diseases found in the Maltese Islands was prepared and mostly published in 2005: research work on a new leafminer for Malta attacking Chickpea (*Cicer*) plants, a new lepidopteran leaf miner attacking leaves of the evergreen oak (*Quercus robur*) and a new plant disease (*Spongospora subterranean*) found on potatoes; a complete list of fungal (and fungal-like) diseases occurring in the Maltese Islands written last year and expected to be published in an Italian journal (PETRIA Giornale di Patologia delle Piante) towards the end of 2006. (For each pathogen host plant data, distribution and relevant comments are included.)

Collections

A collection of diseased plant specimens (including plant galls) and fungal cultures collected in Malta and Gozo has been catalogued and is being maintained at the above-mentioned laboratories. More than 100 dried collected items have been so far deposited at the Agricultural Biology laboratories.

APICULTURE SECTION

The number of colonies and nuclei in the Mdina apiary fluctuated between 60 and 70. A slight increase in number was due to the swarms caught and the production of new nuclei. A decrease in the number was due to the sale of nuclei and queens to beekeepers and a few deaths. Government colonies were inspected regularly and any necessary action was taken to keep them in good health. Activities like feeding, giving increase, changing old combs, robbing prevention, varroa monitoring and control were either performed as a routine or when it was necessary depending on the beekeeping season, weather conditions and other important factors.

Varroa was treated with Apistan strips, which are still effective up to 98%. Colonies were monitored frequently for diseases, especially for foulbrood and nosema.

Queen-rearing was practised in March and November. Both modern queen-right and the more traditional queen-less systems were set up. Queens were produced from the best stock. New queen rearing equipment was also acquired.

Other work included inspections in beekeepers' apiaries and the catching of swarms. The removal of feral colonies was sometimes a dangerous task. These colonies were removed due to public inconvenience and due to the risk of spreading disease to other nearby colonies. The most common problems encountered during our visits at the beekeepers apiaries include starvation during the winter months, pesticide damage, old queens, diseases like foulbrood and varroa and incorrect management. Some inspections were intended to verify the number of colonies in apiaries awaiting the MEPA permission for the building of beekeeping rooms. Other visits in apiaries owned by new beekeepers were intended to judge the suitability of their apiaries for keeping bees.

EFB was treated successfully in some apiaries with the shook-swarm method. The Apiculture staff burned AFB and some severely infected EFB colonies. In such cases healthy nuclei from the Mdina apiary were given to the beekeepers free of charge to compensate for the loss. Further inspections were done to check for the recurrence of these diseases. No antibiotics were used. Beekeepers were given advice on how to sterilise all beekeeping equipment for prevention.

In October Mr Richard Ball, Chief Inspector at CSL, UK came to Malta for a week. This visit was co-financed by the EU under the National Apiculture Programme-Aid 1-Technical Training to Beekeepers. During this week Mr Ball delivered a course related to Apiculture science to Maltese Beekeepers. In total some 50 participants attended. Practical sessions were also conducted at the Mdina apiary.

Some nuclei were leased to farmers for the pollination of greenhouses. Honey samples were collected from a number of apiaries and given to the Veterinary Division for residue analysis. Certificates for the importation of foreign honey were checked, signed and released.

The section in collaboration with Borg Cardona Ltd organised meetings in Malta and Gozo for beekeepers on the use of Api Life Var as an alternative varroacide. An Italian pharmacist representing Chemicals Laif, the company that produces Api Life Var, was brought to Malta by Borg Cardona Ltd to explain its usage, efficacy, side-effects, etc.

A contingency plan was prepared for the possible introduction of SHB in the Maltese islands.

Various meetings were attended for the Green Week fair and the National Trade Fair. In both occasions live bees, bee products, posters and various beekeeping equipment were on display. Informative printed material was given to the public. The apiculture section also put up a stand during the Open Day at PBC, Lija.

Talks on beekeeping subjects were given on the radio programme *'Frott Artna'*. Beekeeping articles were also published on *Biedja u Sajd*. School visits were organised at the Mdina apiary for children of all ages. Secondary school students and also students from MCAST and University were taught beekeeping practices.

A Harvard University senior came over to Malta for the month of November. Her stay was fully sponsored by the University and during this time she helped the Section in various ways and conducted research on old Maltese systems of Apiculture practice.

Work related to the EU funding for beekeepers included an in-depth study of the current EU regulations, meetings and strict deadlines. Important meetings were carried out with Italian experts to make sure that the right procedures are implemented. Various types of documents and applications were produced. Meetings were held with commercial beekeepers. Intensive administrative works and on-the-spot checks were done in collaboration with the Control Unit. All the eligible beekeepers were funded accordingly.

Plant Protection Products

The pesticides control section forms part of the Plant Health Section. This office has the responsibility of two Designated Competent Authorities, one for Biocides and the other for Plant Protection Products. Biocides are classified into four product types namely; Disinfectants and General Biocidal products, Preservatives, Pest Control and other Biocidal products these are further sub-classified into 23 product types. There are over 1000 registered Biocidal Products on the Maltese market. Plant Protection Products (PPPs) are chemical products used on plants to cure and prevent disease. There are over 200 registered products on the Maltese market.

The aim for both Competent Authorities is to ensure that on the Maltese market there exists Biocidal or Plant Protection Products which respect the health and safety of the consumer, that of the user/applicator and the environment. This is achieved through:

- A registration process for the active (chemical) substance and an authorisation process for the product to be placed on the market, according to Legal Notice 294 of 2004 and EC directive 8 of 1998 for Biocides and Legal Notice 115 of 2004 and EC directive 414/1991. The registration of the active substance takes a further step through a centralised European procedure to which all member states are participants and involves the technical and administrative monthly meetings.
- Inspections and authorisations of manufacturers, wholesale dealers and potential retail outlets.
- Inspections for market surveillance of wholesale dealers and potential retail outlets.
- Sampling and analytical testing of fresh produce.
- Sampling of Biocidal and Plant Protection Products on the market.
- Issue of import licences for registered products imported from 3rd countries.

Facts and Figures

- 167 EU type dossiers submitted
- 65 products submitted for authorisation
- 51 products authorised by mutual recognition
- 21 import licences issued
- 67 meetings with individuals/ entities interested in placing products on the market
- 343 queries replied to
- 32 inspections
- 150 Department of agriculture files processed
- 15 tasks performed
- 11 Pesticide Control Board meetings
- 14 sampling events during which 168 samples have been collected

Major Tasks

- Malta has been appointed as a Rapporteur Member State by the Commission and has been assigned five chemical active substances for use in Biocidal products in order to assess the products in all aspect of human and environmental health on behalf of the other member states. Process has been initiated for one active substance.
- The Food and Veterinary Office of the Health and Consumer Protection Directorate General conducted an audit during October. The objective of the mission was to evaluate the Maltese control systems for the Marketing and use of Plant Protection Products and pesticide residues in foodstuffs of plant origin.
- A software program has been developed for the registration process and controls all stages through levels of password control.
- Courses are being organised, in conjunction with the Pesticide Control Board and with the assistance of Malta University Services, for farmers/applicators (12-hour course) and for vendors and wholesale dealers (8-hour course) for qualification and acquisition of a licence.

PLANT QUARANTINE SECTION

- *Phytosanitary Inspections of Commodities originating from Third Countries*: 616 Inspections were carried out of which 381 full inspections and 235 documentary checks.
- Plant Quarantine officers were involved in EUREPGAP (Potato) Certification from end of January up to July 2005.
- Phytosanitary Certificates for export/re-export: 76 Certificates were issued in 2005.
- Revenue collected in 2005 amounted to Lm6,640.
- Statistics were provided on importation of plants and plant products from Non-EU countries (Old and New EU Tariffs) from 1 May 2004 up to end February 2005 using both the present tariffs and the proposed tariffs based on Council Directive 2002/89/EC.
- 86 inspections on labelling and registration of pesticides products were carried out from June to October,
- 88 inspections on wood packaging material originating from third countries were carried out from June owards as per ISPM 15 and EU Directive 2004/102/EC.
- The number of registered traders up to December was 201.

Information to Traders and Importers

During the course of the year various communications were made with traders, importers, government and foreign bodies, private institutions and the general public to clarify any difficulties encountered in interpreting EU Directives on Harmful Organisms and their corresponding legal notices.

Standing Committee on Plant Health (SCPH)

Discussion on current Community phytosanitary measures as regards "non-European fruit flies" proposed by Spain was of direct relevance to Malta because we also import Citrus fruits from Egypt and thus prone to the same phytosanitary risks**.** Topics of direct relevance for Malta were Egyptian potatoes and seed potatoes originating from Canada.

Interceptions

Three cases were reported to the EU Commission and member states:

- Lack of additional information on the Phytosanitary certificate of strawberry plants originating from USA
- Confirmation of CTV on 22 Citrus trees originating from Italy (April case)
- Lack of additional information on the Phytosanitary certificate of oranges originating from South Africa.

Enforcing Commission Directive 2005/16/EC

On 23 November a notice was sent to all fruit traders and importers to inform them about the new Commission Directive 2005/16 regarding the "*amending Annexes I to V to Council Directive 2000/29 EC on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the community"* governing the removal of the protected zone of Citrus Tristeza Virus (CTV). For this reason 25 registered letters were sent to importers and confiscation of all present citrus fruits with leaves and peduncles took place in December.

Internal Inspections and Plant Passports system

Personnel from the Plant Quarantine Section formed part of a FVO Mission in Poland as a national expert on the implementation of the plant passport.

Sampling (national surveys and others)

During November, seven samples were taken from various importers: six samples (grouped) were taken from various importers of seed potatoes to complement the national survey on Ring Rot and Brown Rot; one grouped sample was taken from imported pallets from Japan for further analysis by the Entomology Section with regard to various larvae found in the same pallets.

During December, 24 compound samples were taken from various importers: 21 samples (grouped) CTV field; three samples from confiscated oranges brought from Italy destined for Mycology, Bacteriology and Nematology labs.

Import Statistics

	No of Imported Plant	*Weight of Imported Plant*	*Volume of Imported Plant*	*No of Entries of Imported Plant*
	Piece	Tons	m3	
Fruit & Vegetables (163 detail records)	0	52,328.789	0	14,778
Plants & Cuttings (188 detail records)	5,615,876	1,223.852	11,669,391	2,353
Seeds & Bulbs (41 detail records)	388,727	144,480.316	0	331
Total	**6,004,603**	**198,032.957**	**11,669,391**	**17,462**

PLANT BIOTECHNOLOGY CENTRE

In Vitro Culture Laboratory

The main aim of the In Vitro Culture Laboratory is to produce virus-free rootstocks for the production of stone fruit trees in Malta. The plant material used for propagation was bought virus-free from the Italian Centre at Locorotondo, Italy – 'Centro di Ricerca e Sperimentazione in Agricoltura'. The material propagated included GF677 and Myrobalan 29C, the propagation of which has already been undertaken in previous years.

Production of Myrobalan 29C

The production of Myrobalan was of clone number 3, MYR003, which had been conserved in the cold room from the previous year. The plants gave a satisfactory multiplication rate and 2,019 jars, 32,304 plants, were transferred for multiplication purposes and 1,191 jars, 23,820 plants, were transferred for rooting purposes.

Production of GF677

During the year two GF677 clones were micropropagated; these were the GF008 and the GF009. Clone GF008 had been stored in the cold room since 2004. The jars were gradually taken out from the cold room in order to continue the propagation process. These plants gave very satisfactory results, in fact, 5,968 jars, 96,672 plants, were transferred for multiplication purposes and 3,875 jars, 77,500 plants, were transferred for rooting purposes.

Two jars of fresh GF677 material were purchased from Italy in March and clone GF009 was initiated. Unfortunately this clone did not respond very well to micropropagation techniques with the result that only 1,155 jars, 18,480 plants, were transferred for multiplication purposes and 358 jars, 7,160 plants, were transferred for rooting purposes.

Production of Ornamental Plants

During 2005 a total of around 565 Boston ferns, Nephrolepis bostoniensis, were rooted using in vitro techniques and passed on for acclimatisation. The Boston fern was mainly worked on by a Polish student as training on in vitro techniques.

Research Work

Following suggestions made by our consultant, Dr Elena Yasnetskaya, Gibberillic Acid was added to the normal GF 677 multiplication media in order to help with plant elongation. The idea was eventually scrapped once no difference in plant growth was observed.

It had also been suggested that the jars with plants for rooting are left without lids. This was also scrapped as it led to a lower percentage of plant survival due to yellowing of plant leaves and due to an increase in plant contamination.

An increase in plant survival during acclimatisation was observed when the plants for rooting were taken out of the jars directly in the green house and potted in compost immediately rather then allowing them to soak in a fungicide. The increased survival rate is probably attributed to less handling of the delicate plants.

Maintenance works

Maintenance projects and laboratory upgrades by the Centre's maintenance staff have been an ongoing project throughout the past year. Such works included the replacement of burnt out neon tubes, plastering and painting of all the lab walls which are affected by humidity, painting of one of the doors, repairs to the linoleum, the installation of a new water drain leading from the double distiller/autoclave to one of the Centre's water reservoirs in order to lessen water wastages, and the lab canopy was cleaned, painted and re-sealed and all the aluminium rubber was replaced.

The computer network system was extended from the offices to the laboratories and green house by MITTS Ltd employees and by a private company they contracted.

Glasshouses and Outdoor Facilities and General Activities at the PBC

Acclimatisation

During 2005, about 10,990 in vitro rooted and about 11,070 in vitro unrooted Myrabolan plantlets (1,226 jars) were transferred to the glasshouse for acclimatisation. Certain batches had a very good percentage of rooting plants which in turn resulted in a very high survival rate. On the other hand there were batches in which the rooting was very poor which had resulted in a low survival rate.

GF 677 were also acclimatised during this period. There were 3,474 jars with rooted GF 677. About 40,472 rooted plantlets were transplanted in trays. Plantlets without any roots or without any sign of root formation were discarded, since they are very difficult to survive. Also poor looking plants and chlorotic plants were discarded. Such plants amount to about 42% of the total plant material produced.

Regular caring of rootstocks was carried out. Regular applications of insecticides were applied to control sciarid flies and other insects. Drenching with fungicides was carried out to avoid soil borne fungal diseases. Fertilisers were also applied during irrigation. Acclimatised rootstocks were transferred to the shade house for hardening and to be certified.

Diagnostic Part

A continuous production of herbaceous indicator and indexing plants for virus diagnosis was carried out throughout the whole year. Such work includes regular sowing, transplanting, repotting, irrigation and spraying. Old material was discarded. Hygiene such as cleaning of benches and floors was carried out. A stock of mother plants for the collection of seeds was kept as well.

Ornamental Plants

A number of ornamental plants were propagated. Ferns and Begonia were propagated In Vitro and acclimatised as well. Other plants like Yuccas, Cremnophyton, Helichrysum and spider plants were propagating from last year material by cuttings. Regular caring of plants was carried out.

Sale/Donation of plants

During 2005 the following numbers of rootstocks were forwarded to SVDP: Myrabolan 29C - 440 in pots and 7,046 in trays; GF 677 – 16,968 in trays and 512 in pots.

38 ferns, 9 Begonias, 7 Kalanchoe, 7 Crataegus, 43 Myrtus, 36 Yuccas and 58 spider plants were donated to various entities. Ornamental plants were sold during the year to the amount of Lm131.50

An Open Day was organised at the PBC premises and the total amount of plants sold added up to Lm243.75.

Activities in Plastic house

The plastic house is used mainly for the production of Mother Plants and for the collection of seeds of the herbaceous indicator plants. Some maintenance work on the benches was also carried out.

Activities in Shade house

The shade house is used as the final acclimatisation stage for rootstocks and other plants. Rootstocks are transferred to the shade house for hardening off and then they are transferred to SVDP to be sold to growers. One part of the shade house was used for plants of the Nature Trust.

Maintenance Work

Several maintenance services were carried out at the PBC premises.

- Sanyo growth needed several maintenances.
- Double distiller was also maintained.
- Computer of the glasshouse is still not working.
- Maintenance work at the Balzan Post Office where the Quarantine Officers were for most of the year.
- Plastering and painting of sides of screen houses and façade of the offices.
- Painting of wooden cover of the well near the offices.
- Fixing of new system for returning part of the water used for the double distiller into the fibre tank.
- Building of a site near the garages to store plant material wastes for compost.

Other Activities

Few jars with In vitro almond plants that were brought from Italy started to be propagated. Unfortunately there was a bacterial contamination and further experiments were carried out on them by the consultant. The Plant Health Department website was kept updated.

VIROLOGY UNIT

Monitoring of Quarantine Viral Diseases

Citrus Tristeza Virus Monitoring for Protected Zones

The annual CTV survey for 2005 was carried out during January-February, April-May, and October–December. Forty-four inspections of citrus trees were carried out at private gardens, commercial orchards and garden centres. A total of 687 compound samples were collected from 2,931 trees. All samples were tested by Enzyme-Linked Immunosorbent Assay (ELISA) using commercial polyclonal antibodies. Results of all tests performed were sent to all growers visited.

Pepino Mosaic Virus (PepMV) Survey

This survey was run in accordance with Commission Decision 2004/200/EC. The PepMV survey was carried out during the periods January-March, and September-November. Inspections were made on protected tomato crops, during which a total of 413 compound samples corresponding to 2,045 tomato plants where sampled. The samples were tested by ELISA testing. During the inspections a plant quarantine officer was present. Results were sent to the growers involved in this survey.

Plum Pox Virus Survey

The annual Plum Pox Virus Survey was performed during May-July. Twenty-nine inspections took place in various localities. During the inspections, a total of 620 compound/single samples were collected during inspections from 1,338 stone fruit trees, from private gardens, commercial orchards and SVDP nursery. The trees where checked for visual symptoms of the virus on leaves and fruit, and data on each orchard visited was taken. The samples were all tested by ELISA at the Virology Lab, PBC. Results were sent to all growers/owners visited.

Tomato Spotted Wilt Virus (TSWV) Survey

A new survey for the presence of Tomato Spotted Wilt Virus (TSWV) was started this year during September – November on protected tomato crops. A total of 20 inspections were carried out in various protected tomato crops. A total of 255 compound samples from 1,255 plants were collected and tested for the presence of this virus by ELISA at the Virology Lab, PBC. Letters of results were sent to the growers visited together with the Pepino Mosaic Virus (PepMV) results.

Tests for quality viruses

A total number of 406 trees from SVDP Government Nursery were tested for various certification diseases at the Virology Laboratory.

Molecular Hybridisation Tests for Peach Latent Mosaic Viroid (PLMVd)

Sampling for PLMVd was carried out at SVDP. 58 mother plants were tested by Molecular hybridisation. The non-organic extraction for viroid technique was applied for the certification tests.

Bacteriology Lab

Surveys were carried out as required by Council Directives 98/57/EC and 93/85/EEC which are implemented through LN 290 of 2004 on the Control of Potato Ring Rot and LN 270 of 2004 on the Control of *Ralstonia solanacearum.* Surveys included both visual inspection of plants and tubers for

symptoms of ring rot and brown rot diseases as well as laboratory testing of samples for latent infection using tests and protocols specified in the mentioned legislations.

Surveys were carried out on potatoes introduced from other European countries as well as tubers and plants of potato originating in Malta. In the case of *Ralstonia solanacearum* surveys were also carried out on tomato plantations as required by the mentioned Council Directive.

During the period January-March, 26 greenhouses were visited from which 43 composite samples of 200 stem segments (per sample) were collected and tested for *Ralstonia solanacearum*.

Visual inspection of plants and cut tubers for symptoms of ring rot and brown rot were carried out in the period March-April on potato crop mainly intended for 'export'. 77 plantations were visited in different regions of the islands. When available, 10 tubers per plantation were examined for typical symptoms. Furthermore, 17 plant samples with suspect symptoms, were subjected to official laboratory testing

In May visual inspections of tubers for symptoms of ring rot and brown rot diseases were carried out at the grading stations (Ta' Qali). Tubers from 102 growers were examined. Sample size consisted of 100 tubers per grower except for a few cases when growers refused to co-operate, in which case less than 100 tubers were examined

39 tomato plantations were inspected during June and July and 41 composite samples of 200 stem segments were collected and tested in the laboratory for *Ralstonia solanacearum*.

On 16 August, Dr Simon Eden-Green (Bacteriologist) started his three-month working visit at the Plant Biotechnology Centre. During this visit work was mainly concentrated on setting up and testing procedures for maintaining stocks of culture media and carrying out routine bacteriological tests. The sampling and diagnostic requirements for potato brown rot and ring rot were also reviewed. Several field visits were made during this period with the aim of consolidating records of bacterial pathogens known or suspected to occur in Malta. The visit was terminated on 25 November.

As part of the ring rot and brown rot survey, 83 potato plantations were visited during the months of October and November and observed for symptoms of the mentioned diseases. 50 plant samples with suspect symptoms were collected and subjected to official laboratory testing.

During October and November, eight samples of 200 tubers were collected from potato seed lots introduced from other EU countries. These were subjected to official laboratory testing in December.

Research work 2005

During 2005 the experiments were mainly devoted to GF 677 shoots multiplication, elongation, rooting improving to prevent losses during the acclimatisation in the glasshouse. As a result, it can be considered that some changing in medium and growth condition can be useful.

In vitro propagation of bitter almond plants has been started. This local bitter almond variety is known to be resistant to Maltese drought and alkaline soil and Mediterranean climate. At the same time it produces vigorous stock material known to Maltese horticultural community for many years. By the end of the year a stabile production of almond plantlets in vitro was achieved.

Particular attention was given to study micropropagation techniques for endangered and endemic plants of Malta. Two plants, *Sarcopoterium spinosum* and *Aristolochia clusii*, were multiplied in vitro. Hundreds of *Sarcopoterium* and *Aristolochia* plants are now at acclimatisation stage, ready to be reintroduced into their natural habitat.

Studies on medicinal and ornamental Maltese plants were carried out as well. The research focuses on the study of the priority plants for in vitro propagation. As a result, two plants were chosen for in vitro multiplication and reintroduction back to nature. According to MEPA's opinion, two species of Maltese orchids require urgent conservation effort – *Ophrys lunulata* and *Ophrys lacaitae*. Also a local variety of tulip, *Tulip sylvestris* is a plant that was chosen for propagation in vitro.

Sponsorship was received from MEPA and HSBC "Care for the environment fund". The funds were received for rare Maltese plants micropropagation.

INFORMATION UNIT

This section was involved in the Arbor Week held between 16 and 21 January, organised by the School Arbour Committee. The Section's officials offered their services as guides in the various walks planned each day during that week. A meeting was held on 5 March with the NGOs interested in setting up their shows and exhibitions at Għammieri Complex. On 9 May an activity in connection with the European Agriculture Day was co-ordinated and CDs with PowerPoint presentations were given named *Esperjenza fl-Agrikoltura*.

Information Stand at the Agriculture Pavilion at the International Trade Fair of Malta

This section took part in the International Trade Fair of Malta, in the Ministry for Rural Affairs and the Environment pavilion. This year the Information Section disseminated information about Hands-on Farming and exhibited photos regarding *Esperjenza fl-Agrikoltura*. The magazine *Biedja u Sajd* was also promoted and a special edition was published.

School Visits Programme

120 students visited the farm as part of the Hands-on Farming Project. The students were shown the greenhouses, in the organic and conventional method. Arrangements were made to organise a planting session for Year 5 students. Worksheets were designed entitled *Seeds and Plants* and advised regarding the type of seeds to be used for the sessions.

The Biedja u Sajd Newspaper

The monthly publication of the MRAE, *Biedja u Sajd,* has become a very popular means of communication between the Ministry and the farming community. The articles published are written from various officials of the Ministry and deal with diverse themes related to the agriculture and fisheries sectors. This year's articles included information about financial aid schemes for farmers and herdsmen, plant quarantine, organic farming, poultry, fruit trees, apiculture, rabbits, sheep, medicinal plants and monthly calendar work related to agriculture in general.

Radio Programme

A weekly radio programme, aimed to address issues of interest to the farmers, herdsmen and fishermen is a very effective means to disseminate information to all concerned. This year's topics concerned rural development, oleiculture, subsidies to farmers, fish, food hygiene, cattle, rabbits, honeybees, fertilisers, fruit trees, cheeselets, organic farming, poultry and greenhouses.

AGRICULTURAL SERVICES LABORATORIES

Laboratory Services

In 2005, the ASL handled approximately 740 samples of agricultural materials, consisting mainly of soil samples (Table 1). Compared to 2004, the number of samples processed was less, since fewer routine samples were submitted, and the MALSIS project has been completed. 96 soil samples were submitted by grape producers who have a contract with Camilleri Wines. At this stage, the ASL is investigating the introduction of service fees for routine testing, in order to partially recover costs involved.

Number of laboratory samples and tests provided in 2005		
Type of agricultural material	*No of samples*	*No of tests*
Soil (total), of which:	501	2,872
▪ Routine testing	*172*	*1,031*
▪ K FERT	*31*	*561*
▪ Special assignments	*19*	*51*
▪ MALSIS	-	*84*
▪ Salinity survey	*24*	*86*
▪ Greenhouse surveys	*145*	*433*
▪ Soil sterilisation trials	*14*	*126*
▪ Vine growers	*96*	*500*
Plants	70	238
Irrigation water	166	785
Total	**737**	**3,895**

NATIONAL SOIL UNIT

Soil survey

A soil sampling programme was carried out in an olive grove at Ta` Plankas in Xewkija Gozo. A total of 15 were collected and lead content was determined. A report was compiled and submitted to Malta Standards Authority (MSA), which included the results of the survey together with information on soil resources in the area.

Soil information

During 2005 the NSU received several requests for soil data from public entities, private companies and individuals. The following is a summary of reports prepared using the knowledge base of NSU officers and information extracted from the Malta Soil Information System (MALSIS):

Title of document	***Client***	***Type of data requested***
Designation of Less Favoured Areas in the Maltese Islands – Justification of the designation procedure	Rural Development Dept	Soil limitations and justification report for designation of LFA
Soil Questionnaire for Soil Thematic Strategy	Dutch Presidency	Impact assessment of EU Soil Thematic Strategy
Soil Monitoring Questionnaire for EU Soil Thematic Strategy	EU DG Environment	Soil Monitoring in Malta
State of the Environment Report – Soil Chapter	MEPA	Soil Resources of Malta, quality, indicators and threats
European Environment Agency (EEA) State of the Environment Report Soil Chapter	MEPA	State of Maltese soils with regards to soil contamination and sealing
Agricultural Soil Quality for Land Use and Planning	MEPA	Soil baseline data and maps for Structure Plan Review
Soil of Wied Garnaw	Wied Garnaw Action Group	Report and maps on the soil types and soil management units in Wied Garnaw area
Soil Survey of Ghadira Nature Reserve	Birdlife Malta	Report of soil survey as a basis for environmental management

General Soil Information	Philipps-University of Marburg Germany	Information on the MALSIS project and soil information on a particular site in Mellieha.
Information on Leptosols in Malta	University of Malta, Biology Department	Chemical and physical characteristics of Maltese Leptosols
Carbonates and pH in Maltese soils	Plant Health, MRAE	Soil data to use for the establishment of pathogens

Other matters

The NSU has on various occasions drawn the attention of higher authorities to the fact that a competent authority needs to be designated in terms of the upcoming Soil Framework Directive which is part of the EU Thematic Strategy for Soil Protection. At the moment officers from MEPA are participating in the working groups to develop the strategy. For this reason the NSU is not in a position to prepare itself for the obligations of the proposed Soil Framework Directive.

As a member of the European Soil Bureau Network (ESBN), the NSU contributed to the European Soil Atlas that was launched in November 2005. The launch was held in London in November 2005, and coincided with the ESBN plenary meeting. Due to other commitments, the NSU was unable to participate in this event. The NSU also contributed information to be included in the website portal of the JRC, which provide users with access towards national soil datasets and associated resources along the INSPIRE principles.

NUTRIENT MANAGEMENT UNIT

Research and data collection

The soil correlation and calibration pilot study which was started in 2004 was terminated at the beginning of this year. Soil test analysis was carried out; however, the final report was not finalised as plant analysis could not be performed due to lack of appropriate laboratory equipment.

During the year NMU officials collected a number of different organic crops from the Government Farm to carry out plant analysis, with the aim of generating data on the nutrient content in each of the selected organic crop. Nonetheless, plant analysis was also not performed on these samples. These samples were stored for when the plant analysis laboratory will be functioning. In this regards, the NMU has also set a Nutrient Content database for when the plant laboratory will be functioning the ranges of plant nutrient uptake will be stored to issue correct fertiliser plans, since the data which was used to issue these plans is all based on foreign research.

Data collection on the importation of fertilisers was initiated at the end of this year. Such data will enable the official of the NMU to have a better idea of the fertilisers which are available on the local market and by which fertilisation plans could be based on.

After the participation of the NMU official in a meeting with the CH & FT section officials, discussions were made on the report named the *Production and culture of tomato for processing in Malta* presented by Profs Bianco, Dr Cantore and Dr Vanadia. This report was later translated to English by the same official. After this report was issued, the CH & FT section assisted the NAR & DC to carry out a basic tomatoes plant analysis, which included the dry matter content and the BRIX level of tomatoes. The NMU official issued a detailed fertiliser plans and monitoring programme for this trial.

Direct Adviser Services and Monitoring Programme

As part of the advisory services which the ASL offers, the NMU established the Soil Nutrient Management Database. In this database, records on plant and manure nutrient content are kept from which fertiliser plans are based. During the year 105 fertiliser plans were issued covering a total area of 15 hectares. Due

to lack of soil laboratory equipment, these fertiliser plans were not complete since only tests on soil potassium levels were made. Soil testing was not performed on the phosphorus and nitrogen.

The same unit offered the service of crop nutrient management and monitoring to a number of farmers. These farmers were guided on quantities of fertiliser which need to be supplied for a specific type of crop. They were also guided on how to fill the fertiliser purchasing and application record sheets.

SEEDS AND OTHER PROPAGATION MATERIAL UNIT

EU-related affairs

During 2005, the SPMU attended various meetings held by the EU Commission/Council and the Community Plant Variety Office (CPVO). Instruction notes and reports were prepared for such meetings and as well as for a number of meetings for which no Maltese representative was present. All the documents were thoroughly reviewed and comments were sent to the EU Commission and the United Kingdom Presidency when needed. Also, proxy arrangements with the UK were made for voting on behalf of Malta during meetings of the Standing Committees not attended. Various issues related to the propagation material sector and to plant variety rights have been discussed. The following is a resume of the issues discussed of utmost importance:

- the amendment of the Annexes of Council Directive 68/193/EEC on the marketing of material for the vegetative propagation of vines within the European Community;
- accession of the European Community to the International Union for the Protection of New Varieties of Plants;
- authorisation to Greece and Poland to prohibit the use of the genetically modified varieties of maize listed in the Common Catalogue of varieties of agricultural plant species in their territory;
- the placing on the marketing of seed belonging to varieties for which an application for entry in the National Catalogues has been submitted;
- the release of genetically modified Bt 10 maize by Syngenta instead of Bt 11 and the importance of notification by EU member states to the European Commission if the presence of Bt 10 is detected in their territory;
- authorisation to member states for the temporary marketing of seed not satisfying the requirements in respect of minimum germination;
- the specific conditions under which seeds and propagating material of agricultural and vegetable plants may be marketed in relation to conservation *in situ* and the sustainable use of plant genetic resources through growing and marketing; and
- the Community comparative trials and tests carried out in 2004 and 2005 on species of agricultural plants and vegetables and in particular the alleged finding of the potato brown rot bacterium (plant quarantine organism) in the seed potatoes of Denmark.

Malta, together with Cyprus, has been granted authorisation from the EU Commission to be exempted from implementing the beet seed marketing directive (Council Directive 2002/54/EC). This plant species is not economically important for Malta and is not reproduced in its territory.

The SPMU prepared a number of memoranda and instruction notes upon request by the EU Affairs Directorate (MRAE) and the EU Secretariat of the Auberge de Castille for COREPER, AGRIFISH and Inter-Ministerial committee meetings regarding the following issues:

- the accession of the European Community to the International Union for the Protection of New Varieties of Plants;
- equivalence of checks on practices for the maintenance of varieties carried out in third countries;
- provisional prohibition in Greece of the marketing of seeds of maize hybrids with the genetic modification MON 810 inscribed in the Common Catalogue of varieties of agricultural plant species.

The SPMU proof-read the Maltese versions of draft EU legislation and other documents prepared by the CPVO before being published in the Official Journal of the EU and the website of the CPVO.

National legislation

The SPMU drafted the legal notice Plant Quarantine (National Certification Scheme) Regulations, 2005 covering propagation material of vegetables (excluding seeds), forest trees, fruit trees, vines and ornamental plants. This document was published in the Government Gazette on 17 May as LN 138 of 2005.

Trials and tests

The SPMU in collaboration with the Crop Husbandry/Fruit Trees Section have taken the initiative to cultivate at the NARDC in Għammieri onion (2004-2006) and garlic bulbs (2005-2006) originating from seeds collected from various sources which are assumed to belong to local varieties of such plant species. During the vegetative cycle of the resulting crops, morphological characterisation of the crops and the determination of dry matter of the bulbs taken randomly from the plots were carried using the plant descriptors established by the Community Plant Variety Office and the International Plant Genetic Resources Institute. These tests shall be carried out in the following year. All the data collected to date will be used for the formulation of a preliminary description of such varieties.

Plantlets of geranium species were sent to Naktuinbouw in the Netherlands where a comparative trial and tests were carried out on the initiative of the EU Commission in order to check the level of harmonisation of the EU legislation on the marketing of propagation material of ornamental plants in the EU member states.

Species and varieties of propagation material and its marketing

The SPMU gave advice to other national and foreign public and private entities on the following issues:

- the requirements for the importation and registration of species and varieties of seeds of agricultural plants, vegetables and ornamental plants;
- the propagation and cultivation of indigenous varieties of peach and olive trees;
- the commencement of the production of propagation material of *Citrus* species in Malta.

More activities related to the conservation of plant genetic resources and access and benefit sharing have been carried out.

Also, the SPMU has sent information to the EU Commission and the European Seed Certification Agency upon request regarding seed harvest in 2004, net farm-gate selling prices received by growers and certification of certified seeds of agricultural plants and vegetables produced in 2004.

The draft technical protocols for the conduct of distinctness, uniformity and stability testing of potato and sheep fescue/red fescue was reviewed. These have been formulated by the CPVO and the International Union for the Protection of Plant Varieties (UPOV) respectively. Comments were sent to the CPVO and UPOV as requested.

FORAGE QUALITY UNIT

The Forage Quality Unit was not in operation in 2005 since the post of scientific officer in animal nutrition was vacated the previous year and no new personnel were recruited.