

**PLANT PROTECTION PRODUCTS
USAGE ON CROPS IN MALTA
2007**

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SUMMARY

The second sample survey on the use of plant protection products on commercially grown crops in Malta and Gozo took place in the summer months of 2007 and covered the agricultural year from September 2006 to August 2007. Plant protection product treatments to permanent crops, mainly vineyards and peaches, were assessed over the same time period. Information on plant protection products usage was collected from a stratified sample of farmers and growers across Malta and Gozo with holdings larger than 0.2 ha of utilised agricultural area. The data was raised to give estimates on the total land coverage of Malta and Gozo, with the exception of the very small holdings, whose combined area is less than 5 per cent of the total utilised agricultural area in Malta and Gozo.

Twenty-one crops were included in the survey: set-aside areas, fodder crops, potatoes, broad beans, onions, carrots, tomatoes, vegetable marrows, sugar melons, water melons, other vegetables, vines, citrus, peaches, other stone fruit, other permanent crops, plants and flowers, greenhouse tomatoes, greenhouse vegetable marrows, greenhouse sugar melons, greenhouse water melons, other greenhouse vegetables.

Due to the limited areas under the use of biological methods and also due to the restricted sample size, no specific questions were implemented within the questionnaire on the use of biological methods.

In order to reduce the response burden on the farmers, areas with significant crops were surveyed. The other crops were grouped in the 'others' sections and these areas were only surveyed to cover the total land area as the impact of pesticides on these areas was insignificant.

Large areas of some crops, especially areas used for forage crops remained untreated with any plant protection products. On the other hand, crops such as potatoes and vines were extensively treated.

Control of disease was the most frequent reason for plant protection products use, with fungicides dominating usage by both weight of plant protection products applied and area treated. On average, potatoes, fresh vegetables in the open, fresh vegetables under glass, vines and citrus fruit received over 4 fungicide treatments. The most popular products being used were sulphur or mancozeb. These two active substances amounted to 96.4% of all active substances applied by weight.

Herbicides were infrequently used in crop production. Its main usage was on forage crops 45.6% of the crop cultivated received at least one treatment. In fact, an average of 1 herbicide treatment was applied on forage crops.

The use of insecticides was an important aspect in citrus and stone fruit cultivation. In fact, 98.7% and 90.5% of the areas treated with citrus and stone fruit were sprayed with some form of insecticide. On average crops received 3.3 insecticide treatments with citrus and stone fruit receiving on average 5.0 and 4.4 treatments respectively.

The Maltese agricultural scenario is dominated by land fragmentation, and as a result, plant protection products were largely applied by knapsack, with 76.5% of all applications being sprayed in this manner, while 14.4% of all applications were applied by tractor mounted spraying.

Pesticide usage in Malta follows a typical pattern under a Mediterranean climate. Herbicide applications are mainly used in the beginning of the rainy season, which starts in September, when the weed seeds begin to sprout. Areas treated with herbicides reached its peak in January whereas dry conditions in the April/September season retard weed growth. Fungicide use occurred throughout the whole season, with the main period of application occurring April to July, reaching a peak in June. Insecticide use was also used throughout the whole of the agricultural year, although its usage reached a maximum in the June/July period.

1. INTRODUCTION

1.1 HISTORY AND SCOPE

Plant protection products have been used in the agricultural sector for a number of years. As a consequence of their usage, environmental pressures are on the increase for a reduction in the use of plant protection products. These past years a growing awareness among the general public to monitor their usage has been evident.

Pressures on demand for greater agricultural production have, perhaps, brought about greater use of plant protection products. This exercise is intended to quantify usage in Maltese agricultural practices. There are no licensed companies registered as manufacturers of plant protection products in Malta.

1.2 BACKGROUND

Lack of accurate data concerning plant protection products use is generally recognised as the most important obstacle to measuring the risks linked to plant protection products. This applies particularly to the risks for the environment. Measurements of risks related to the use of plant protection products need appropriate indicators and therefore, Member States, the Commission and the OECD, conducted preliminary studies for their establishment. In this context, experts have expressed their concerns about the accessibility, the transparency, the adequacy and the reliability of data on plant protection products use.

In Decision 1600/2002/EC adopting the 6th Environment Action Programme (6EAP), the European Parliament (EP) and the Council recognised that the impact of plant protection products on human health and the environment and in particular by those used in agriculture, must be reduced further. They underlined the need to achieve a more sustainable use of plant protection products and called for a significant overall reduction in the use of plant protection products and the associated risks, consistent with that necessary for crop protection. In its Communication to the Council, the EP and the Economic and Social Committee (EESC) entitled 'Towards a Thematic Strategy on the Sustainable Use of Pesticides' (COM (2002)349 final), the Commission clearly recognised the need for detailed, harmonized and up-to-date statistics on sales and use of plant protection products at EU level and proposed to establish relevant mandatory requirements within two years of the adoption of the Thematic Strategy for the reinforcement of ongoing work on the collection of data concerning plant protection products use.

Until now, statistics on plant protection products brought into the country, whether from other EU states or 3rd countries are collected by the International Trade Section within the National Statistics Office. No specific surveys conducted by the NSO or the Ministry of Rural Affairs and the Environment on sales data have ever been conducted. As Malta has no indigenous production of plant protection products, this should give reasonable figures on the amounts likely to be used. However, the statistics are rendered less accurate because they comprise a mixture of net and gross weights of imports, sometimes including packaging. Furthermore, even if accurate figures could be compiled on the actual amounts of plant protection products entering Malta, this would give no indication of whether or not they were actually used in the year brought, where they were used, on what crop or at what dose or frequency of application.

1.3 LEGAL FRAMEWORK

In Malta the legal basis for the collection of agricultural statistical data is the Malta Statistics Authority Act No XXIV, enacted in the year 2000. This places full responsibility on the National Statistics Office to carry out any statistical survey and to produce official statistics. Extracts from the Act, of the main functions of the office are:

Section 10

(2a) "to provide on an impartial basis, quantitative and representative information about the economic, demographic, gender issues, social and environmental situation in Malta, to all users including the Parliament, the Government, institutions, ... ; where possible such data should be provided on a regional basis".

(2b) "produce the data, and shall be subject to the principles of reliability, objectivity, relevance, statistical confidentiality, transparency, specificity and proportionality".

(2c) "Supply the information necessary to evaluate the quality of official statistics and make accessible to the public the methods used for their production."

Section 35

"The Director General may prepare forms, questionnaires and other records for the collection of information under this Act and the instructions necessary for their proper completion, and shall specify the date or period within which these completed forms, questionnaires and other records or the required information shall be returned to the Authority."

All individual data collected during the survey is confidential. No data, which might single out individual information, may be published. Data collected through the survey is intended for statistical purposes only and may only be used for statistical publications, tables and analysis.

All persons engaged in the data collection, handling and processing of data are obliged to keep the confidentiality. The filling in of statistical questionnaires is compulsory, under the Statistics Act.

2 CONTENT

2.1 PURPOSE OF THE SURVEY

The survey was conducted to establish information on the amounts of plant protection products used during the production of Malta's most important crops. Such information is vital if potential risks to consumers, workers and the environment are to be monitored with the aim of reducing them, as outlined in the aforementioned Thematic Strategy.

The survey aimed to establish the extent of plant protection products use on particular crops through a fully stratified sample of farmers. The data collected in the survey included:

1. the proportion of the crop receiving plant protection product treatments,
2. the number of times crops were treated with each plant protection product,
3. the seasonality of plant protection products use,
4. methods of application,
5. the range and types of plant protection products applied.

Through this survey the NSO will be able to monitor what changes have taken place and whether improvements in plant protection products practice, and subsequent reductions in risks, are occurring over time.

2.2 LAUNCHING OF THE PROJECT

The first contact on the subject was made during April 2006 where Mr. Pierre Nadin, from Eurostat, had asked the NSO if it wanted to make a follow up on the survey that was undertaken in 2005. At the time, the NSO gladly accepted. The Agriculture and Fisheries Unit undertook a set of meetings with the Plant protection products Control Section within the Ministry of Rural Affairs and the Environment in order to explore and integrate the available data. A questionnaire to cover EU requisites was designed.

Personnel, from the Ministry of Agriculture and Rural Affairs, with a sound background in this field, were selected to act as enumerators and briefed extensively to carry out the survey on the selected farmers. A detailed briefing at the NSO premises was held in order to explain the questionnaire and the importance of the project.

Farmers were informed by mail and were eventually interviewed individually by the enumerators. Enumeration started in the second week of July 2007 and was concluded by the end of September 2007.

2.3 TRAINING OF INTERVIEWERS

A total of ten (10) interviewers were engaged for the collection of pesticide information from the farmers. The survey period covered the crop year from September 2006 to August 2007. Enumerators were provided with a list of all registered plant protection products that were imported into Malta. This list served as a guideline to facilitate the data collection. Any unregistered pesticides used by the farmer were to be reported to the NSO so that an investigation on the percentage and name of active substance used could be carried out. Where the NSO could not trace the product, the farmer was asked to provide information on the retailer of the product so that the retailer could provide the necessary information.

2.4 SCOPE OF SURVEY

The urgent need for complete, reliable and comparable statistics on plant protection products use at EU level will help the Commission to implement and prepare EU policy on the use of pesticides.

Records on the importation of pesticides are kept by the 'International Trade Section' within the NSO but are only kept at CN Code level and by Chemical Group. The net weight by CN Code is also available. However, this does not reflect the usage on particular crops, hence, the necessity to carry out a statistical survey is essential. There are only a handful of importers who are involved in plant protection products trade.

3 SURVEY METHODOLOGY

3.1 PREPARING THE SURVEY OPERATIONS

3.1.1 Population and frame

The NSO decided to carry out a full-scale sample survey on the most popular crops which are grown on the Maltese Islands. These crops covered 80 per cent of the total crop area covered by the report. Areas of minor importance were neglected for the survey as it would be too complicated to obtain precise information on these areas. Secondly, the restricted sample size due to budgetary constraints acted as a barrier to survey certain crops.

In 2001, the Agriculture and Fisheries Unit conducted an agricultural census with no thresholds. This enabled the sector to have a complete overview of the agricultural sector in Malta and Gozo. As the agricultural register is maintained and updated regularly with other surveys and administrative sources, the agricultural register at the time of selection had a total of 11,039 agricultural holdings with a total of 9,412 ha of utilised agricultural area.

In order to eliminate certain agricultural holdings from the survey, agricultural holdings with a utilised agricultural area of less than 0.2 ha were excluded from the target population. These areas are mainly used for self-production and are not considered commercial. Pesticides on these areas are considered negligible and it is also very difficult to obtain certain data on areas producing crops for self-consumption. With this in mind, a total of 2,422 holdings were excluded from the sample and these holdings had a combined area of 244.1 ha or an average 0.1 ha per holding. These holdings account for approximately 2.5 per cent of the total UAA in Malta and Gozo.

The initial sample contained 6 strata as can be seen in table 1.

Table 1. Initial distribution of strata by size class of UAA (ha) and typology

Typology	Size class of UAA (ha)		
	$\geq 0.2 - < 1$	$\geq 1 - < 5$	≥ 5
1,4,5,7,8	Stratum 1	Stratum 2	Stratum 3
2,3,6	Stratum 4	Stratum 5	Stratum 6

It was decided to open up strata 2 and 5 into 4 strata, namely 21 and 22 and 51 and 52. The reason behind this decision was the fact that variability of the holdings chosen would be too large and that the results of the survey could be misleading. The decision to split both strata into 4 separate strata would eventually reduce the variability within the strata and thus increase the precision estimates. The sample design in table 1 was replaced with that in table 2. Due to the restricted sample size and also due to the variation in sizes of UAA no regional sampling was undertaken and all holdings included in the survey were extracted at NUTS 1 level. In order to increase precision estimates, stratification was undertaken at the principal level of typology and size classes of the utilised agricultural area.

The holdings in the sample were distributed according to the table below.

Table 2. Final distribution of strata by size class of UAA (ha) and typology

Typology	Size class of UAA (ha)			
	$\geq 0.2 - < 1$	$\geq 1 - < 3$	$\geq 3 - < 5$	≥ 5
1,4,5,7,8	Stratum 1	Stratum 21	Stratum 22	Stratum 3
2,3,6	Stratum 4	Stratum 51	Stratum 52	Stratum 6

The distribution of the target population of agricultural holdings that were covered by the survey is given in Table 3 below. A striking feature about Maltese agriculture is that the majority of agricultural holdings above the threshold are still relatively small, as illustrated in Table 3 and Chart 1. In fact, 67.3 per cent of the target population have a holding size of between 0.2 ha and 1 ha of UAA. 1.6 per cent of the target population can be considered as large holdings, having 5 ha or more of UAA per holding. On the other hand, 2,685 holdings have a UAA between 1 and 5 ha.

The distribution of the UAA in Malta is somewhat different and this can be seen in Table 4 and Chart 2. 31.2 per cent of the UAA above the threshold is accounted for by 5,798 holdings having between 0.2 and 1 ha, with an average holding size of 0.5 ha. Agricultural holdings with an agricultural area of 5 hectares and above make up 13.3 per cent of the total agricultural area. The average holding size of these holdings is 9.1 hectares.

In order to reduce the variability of the largest holdings, all holdings in Stratum 3 and Stratum 6 were to be exhaustively surveyed as these holdings were considered large.

Table 3. Distribution of agricultural holdings by size class of UAA (ha) and typology

Typology	Size class of UAA (ha)				TOTAL
	≥ 0.2 - < 1	≥ 1 - < 3	≥ 3 - < 5	≥ 5	
1,4,5,7,8	2107	771	115	39	3032
2,3,6	3691	1531	268	95	5585
TOTAL	5798	2302	383	134	8617
% of Total	67.3%	26.7%	4.4%	1.6%	100.0%

Chart 1. Percentage distribution of agricultural holdings by size class of UAA (ha)

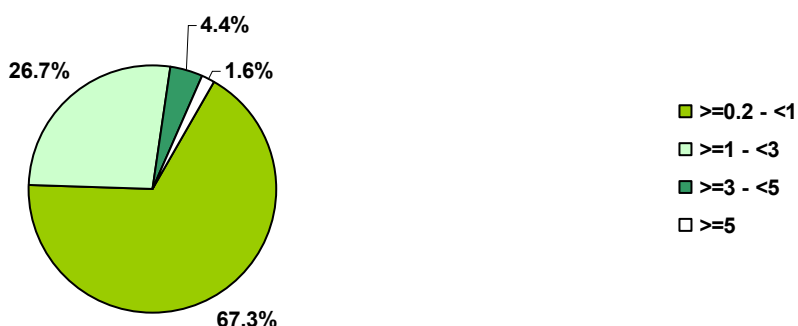


Chart 2. Average holding size (ha) by size class of UAA (ha)

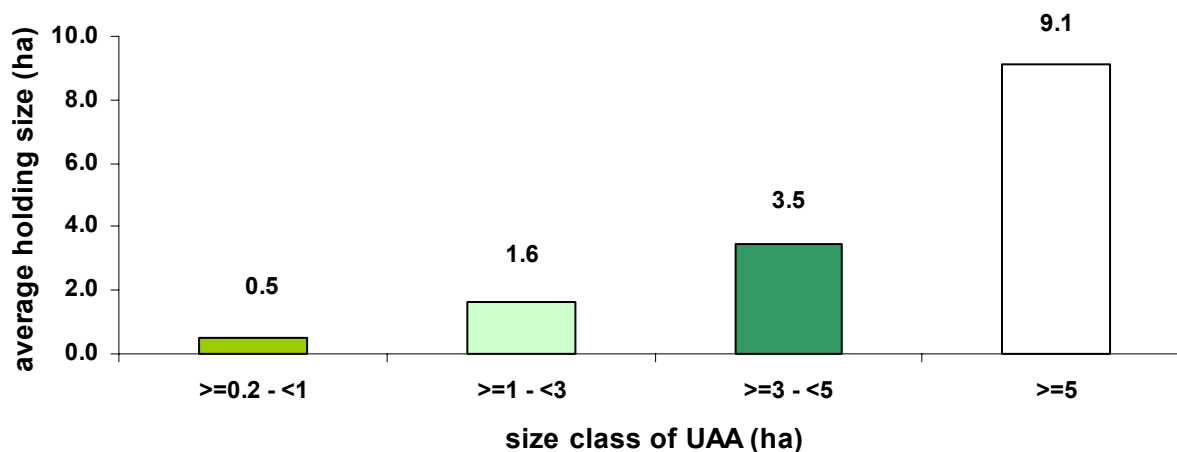
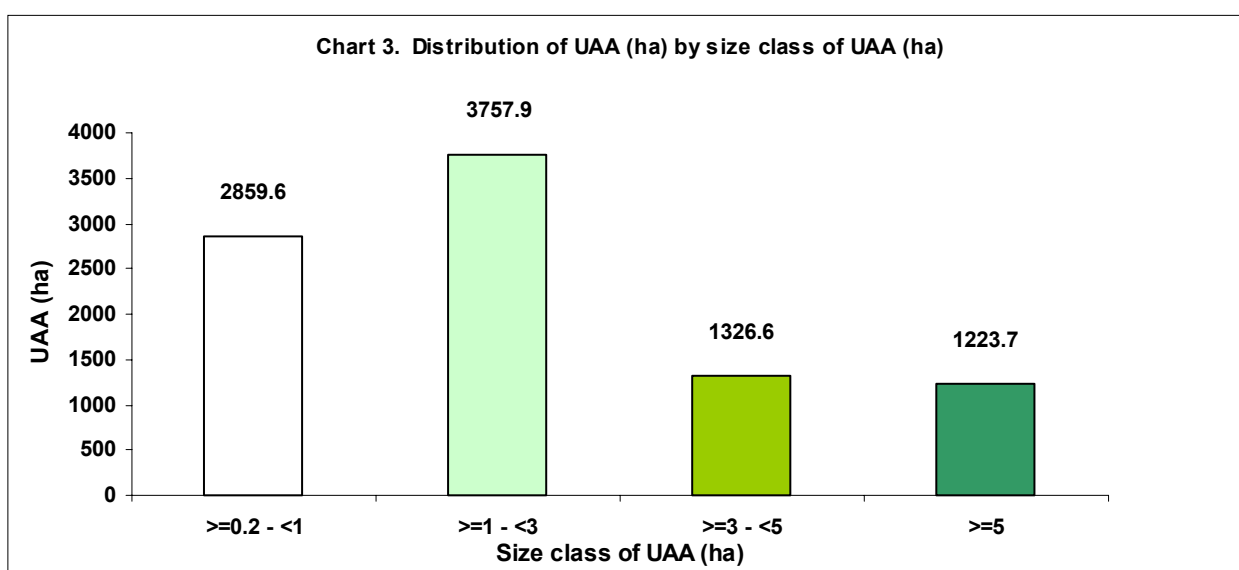


Table 4. Distribution of UAA (ha) by size class of UAA (ha) and typology

Typology	Size class of UAA (ha)				TOTAL
	≥ 0.2 - < 1	≥ 1 - < 3	≥ 3 - < 5	≥ 5	
1,4,5,7,8	1021.4	1230.9	401.2	402.2	3055.8
2,3,6	1838.2	2527.0	925.4	821.5	6112.1
TOTAL	2859.6	3757.9	1326.6	1223.7	9167.9
% of Total	31.2%	41.0%	14.5%	13.3%	100.0%



3.1.2 Survey design

The initial sample design can be seen from the table below. The agriculture and fisheries unit opted for the Optimum allocation method in order to obtain the best sample. Using the optimum allocation method the Agriculture and Fisheries Unit tried to increase the sample sizes in those strata that had a greater degree of variability within the stratum. Thus, a direct relationship may be seen with the sample size and the degree of variability.

From table 5, 22.1 per cent of all holdings were to be surveyed from stratum 51 as this stratum contained holdings with the greatest degree of variability. On the other hand, only 6.0 per cent of the holdings surveyed were to be chosen from stratum 1 as this stratum had the least degree of variability. Due to the sizes of the holdings in strata 3 and 6, these holdings were to be exhaustively surveyed.

Table 5. Initial sample distribution of holdings by size class of UAA (ha) and typology

Typology	Size class of UAA (ha)				TOTAL
	≥ 0.2 - < 1	≥ 1 - < 3	≥ 3 - < 5	≥ 5	
1,4,5,7,8	24	51	10	39	124
2,3,6	48	88	44	95	275
Total	83	139	54	157	399

Table 6. Initial sample distribution of holdings by size class of UAA (ha) and typology

Typology	Size class of UAA (ha)				TOTAL
	≥ 0.2 - < 1	≥ 1 - < 3	≥ 3 - < 5	≥ 5	
1,4,5,7,8	6.0%	12.8%	2.5%	9.8%	31.1%
2,3,6	12.0%	22.1%	11.0%	23.8%	68.9%
Total	18.0%	34.9%	13.5%	33.6%	100.0%

Table 7. Final sample distribution of holdings by size class of UAA (ha) and typology

Typology	Size class of UAA (ha)				TOTAL
	≥ 0.2 - < 1	≥ 1 - < 3	≥ 3 - < 5	≥ 5	
1,4,5,7,8	24	50	10	35	119
2,3,6	47	86	44	85	262
TOTAL	71	136	54	120	381

Table 8. Weighting structure of holdings by size class of UAA (ha) and typology

Typology	Size class of UAA (ha)				TOTAL
	≥ 0.2 - < 1	≥ 1 - < 5	≥ 3 - < 5	≥ 5	
1,4,5,7,8	87.792	15.420	11.500	1.114	25.479
2,3,6	78.532	17.802	6.091	1.118	21.317
TOTAL	81.662	16.926	7.093	1.116	22.617

The initial sample size amounted to 399 agricultural holdings. In order to maintain the target sample of 399, if an enumerator was not able to trace a specific farmer, that farmer was replaced with another farmer within the same stratum so long as this person had his land registered with the IACS department. Due to the complexity of the survey, only holdings with IACS site plans were interviewed. In cases where the holdings could not be replaced and no IACS site plans were available the interviewer had to interview the farmer. For this survey, the unit observation was the parcel while the unit of enumeration was the holding. All the parcels of the holding were to be analysed.

Where a holding could not longer be replaced within a stratum, the weights were adjusted with the formula below.

$$W_{adj/h} = W_h \times \left(\frac{n_h}{n_h - r_h} \right)$$

where:

$W_{adj/h}$ is the adjusted weight of stratum h

W_h is the initial sample weight of stratum h

n_h is the number of holdings in the sampled stratum h

r_h is the number of non-response holdings within stratum h

Overall, a total of 381 agricultural holdings were surveyed, representing a response rate of 95.5 per cent.

The sampling plan did not take into consideration holdings using biological methods. In order to obtain a representative analysis of biological methods, a census of these holdings would have to be undertaken. Given the financial and human resource constraints in implementing the survey on Pesticide use it was not possible to include in the sample all the holdings that are using biological methods even though the number of holdings using these methods is negligible in comparison to the number of holdings not using these methods.

With the aid of site plans, the farmer trace down the use of plant protection products for each crop within each parcel, thus reducing the workload of the enumerator and also reduce to burden on the farmer himself.

3.1.3 Selection of crops

From the survey undertaken in 2005, the most important crops sprayed with pesticides were identified. The selection of crops was based on three criteria – the intensity of pesticide usage, the area coverage of the selected crop and the number of holdings with that particular crop. All crops chosen were deemed to be statistically representative at least at national level. In some cases, although the intensity of pesticide usage was high, such as strawberries, these were excluded from the sample for two main reasons. The first reason being that although intensive usage was placed on strawberries, the land coverage with strawberries is less than 0.5 per cent and so pesticide usage can be considered as negligible overall. The second reason deals with sampling. In order to obtain a representative sample of PPP usage on strawberries, all holdings with strawberries would have to be undertaken. This would in turn, increase the sample size of the survey.

Agricultural crops with a low intensity of usage such as fodder and potatoes were surveyed, as these are the most commonly grown. Crops with a low intensity usage, a low coverage area or a few agricultural holdings, such as plums, were excluded as the overall impact of PPP use would be negligible. Certain types of crops were grouped in order to obtain the coverage of the UAA of the holding although PPP usage was not asked for. A case in point is where, for example, a farmer simultaneously cultivated green beans and peas. These were grouped together under a code for other vegetables.

Table 9. Expected intensity of plant protection products use by crop

Crop	Crop code	Surveyed for PPP treatment
Set-aside	11	No
Forage	12	Yes
Potatoes	13	Yes
Onions	14	Yes
Carrots	15	Yes
Tomatoes	16	Yes
Vegetable marrows	17	Yes
Sugar melons	18	Yes
Watermelons	19	Yes
Other vegetables	20	No
Grapes	21	Yes
Citrus fruit	22	Yes
Peaches	23	Yes
Other stone fruit	24	No
Other permanent crops	25	No
Plants and Flowers	26	No
Tomatoes greenhouse	27	Yes
Greenhouse vegetable marrows	28	Yes
Greenhouse sugar melons	29	Yes
Greenhouse watermelons	30	Yes
Greenhouse other vegetables	31	No

3.2 DATA COLLECTION

The collection of data was done in two stages. The first stage of data collection was where the interviewer had a *summary* questionnaire to fill in. This questionnaire gave an insight on the use of agricultural area at parcel level, the area of a crop sown, the number of times this area was utilised during the season, if it was irrigated, if it was treated and the sowing and harvest dates. The questionnaire also included data on any pre-planting treatments to the parcel.

Each site plan has a unique number and the enumerator was instructed to list all the details of all the crops grown within that particular parcel of land. This was known as the primary stage and it was this data to be filled in the *summary* questionnaire. Parcels on holdings with no IACS maps were classified as 999999.

The second part of data collection referred to treated areas. The *treated areas* questionnaire was filled in depending on what was filled in the *summary* questionnaire. If, in the *summary* questionnaire a crop was identified as being treated, then this would have to be filled in the *treated areas* questionnaire. The treated areas questionnaire incorporated specific questions on the application date, the product, the method of application and the number of treatments. A software program, built by the IT section within the NSO, incorporated conversions of each product used to convert all pesticides at product level to active substance level.

It was decided not to apply any calibration methods, as land areas from the Census of Agriculture are 8 years old and any changes of crop areas would not be reflected.

3.3 CONTROL OF THE DATA

Data were immediately vetted after the interviewing stage. Emphasis was placed on the interviewers to report back to the NSO after the first two completed questionnaires in order to monitor the data collected by the interviewer. Any errors made by the interviewer were corrected at once with the interviewer so that successive errors would not be repeated. In certain cases, where NSO vetters could not correct the data, the questionnaire was sent back to the interviewer, who had to contact the farmer for verification of the data or correction of the data. During the interviewing stage, a software application was built by the IT unit within the NSO. When the last questionnaire was received, all the data was then inputted.

Due to the shortage of staff trained on the use of PPP's within the NSO, staff specialized in PPP's from the Ministry of Rural Affairs and the Environment were engaged for data collection. Although the majority of those engaged worked as inspectors for the ministry these people were the only ones suitable for data collection. It was stressed that they would be working for the NSO under oath in this project and that all data collected from the holdings could not be used otherwise. On suspicion that interviewers were using the data elsewhere, would lead to an immediate termination of the interviewer with the NSO. This point was stressed in order to safeguard the interests of the farmers and the data collected from them.

The second stage of analysis took place after data inputting where any errors through data inputting were checked and any outliers of the data were identified.

Once the second stage of data validation and analysis took place, all relevant tables were compiled.

A copy of the questionnaire is attached in the Annexes.

3.4 DIFFICULTIES ENCOUNTERED

Any survey undertaken does not come without its difficulties in data collection. One of the main problems that the majority of interviewers found was that the farmer does not keep records and thus it is quite complicated to obtain accurate information.

Another problem engaged was that not all farmers are in the IACS list. In strata where all holdings are exhaustively surveyed the estimation on PPP use can be quite difficult.

Ideally, the data collected through this survey should be undertaken through a panel survey. This would increase the accuracy but will also increase the cost of the survey. The survey was undertaken after the reference year elapsed and thus makes it even more difficult to obtain accurate data on a specific parcel of land on a certain crop after so many months have elapsed.

As the survey is rather complex and time consuming, the average time spent at a farmer is long and thus the farmer is constantly frustrated. This eventually leads to a decrease in the overall reliability of the data.

The same interviewers undertaking the surveys are also inspectors for the Ministry and thus there could be conflicting results. The problem is that these are the only people trained to do such specific surveys.

Being a small country, there are certain farmers who are contacted several times a year to provide information on agriculture, business, other items outside statistics. With surveys like PPP use, which are quite complicated, this can result in farmers refusing to take part in other surveys. A major problem is faced when a large farmer does not want to take part in the interview. Fortunately, only a handful of farmers refused to co-operate and very few were from the large strata. This could lead to an overall distortion in the results. Refusal of large farms can result in an overall distortion of the final results.

Apart from cost constraints, many institutions are also facing human resource problems. Such surveys required skilled human resources, which in many cases, national statistical institutions do not have.

The agricultural register is an important issue if you want to have reliable results from your survey. If the agricultural register is not maintained and updated frequently your final grossed up results may not be as reliable as they should be. Malta's next agricultural census will be held in 2010.

3.5 THE COST OF THE SURVEY

Table 10. Expenses incurred in survey implementation

	Budgeted expenditure	Actual expenditure
	€	€
Total	19,909.91	14,602.58
Staff Costs	11,201.39	12,068.16
<i>Permanent Staff</i>	<i>4,201.39</i>	<i>6,299.47</i>
<i>Temporary Staff</i>	<i>7,000.00</i>	<i>5,768.69</i>
Travel/Subsistence Costs	7,266.00	1,579.11
Other Direct Costs	140.00	-
Eligible Indirect Costs (7%)	1,302.52	955.31

4 PUBLICATION AND DISSEMINATION

A news release disseminating the final results of the Plant Protection Products usage on crops in Malta will be published in the second quarter of 2008. These results, broken down in detail by subject matter will also be available on the National Statistics Office website in PDF-format.

Tables include information on the structure area surveyed, basic area treated, formulation area treated, and application rates by formulation.

5. EVALUATION OF RESULTS

5.1 GENERAL OVERVIEW

5.1.1 Area of crops treated

Table 12 corresponds to the basic area treated of each crop on holdings above the 0.2 ha threshold. This table includes the estimated area of the total crop grown. The basic treated area is independent of the number of times a crop may have been treated and is best described as the area grown excluding the area receiving no plant protection products treatment, or, for each plant protection products group (fungicide, herbicide, insecticide etc.), the area grown excluding the area not treated with that particular plant protection products group.

The total area of crop grown of the major crops surveyed amounted to 8100.5 ha (Table 11), with 62.7 per cent or 5,077.6 ha receiving a particular treatment.

As in previous surveys in agricultural statistics, forage areas are the largest areas cultivated, with 5,004 ha. These areas also account for the largest area treated with 44.9 per cent of all treated areas coming from forage cultivation. On the other hand, forage areas are the least extensively treated crops, with only 45.6 per cent of all forage areas receiving at least one treatment.

The most extensively treated crops were crops cultivated under glass, where all the area surveyed was treated. Other crops where the majority of the crop was treated were vegetables cultivated in the open (86.6%), Potatoes (96.4%), Vines (91.6%), and Stone fruit (87.1%). Citrus fruit areas received the least amount of treatments with only 45.5 per cent of the area under citrus fruit receiving at least one treatment.

5.1.2 Intensity of treatment

The intensity of treatment refers to the number of times a crop was treated. This is identified in table 14. The intensity of treatment depends widely on the crop and the pesticide used. In the case of forage crops, although 45.6% of the area was treated, these areas all received herbicide treatment, and on average, this area was treated only once with herbicide. On the other hand, vegetables grown under glass received an average of 11.1 treatments where fungicides were applied. Vines, on average received 8.3 treatments of fungicide applications and 2.9 treatments of insecticide sprays.

5.1.3 Methods of application

Many parcels of land are very small, and as a consequence, plant protection products in most of the cases cannot be applied via tractor driven machinery. As a result, the knapsack was the most common form of applying plant protection products in Malta. During the agricultural year 2006/07, applications via knapsack amounted to 76.5% of the formulation area (Table 15). On the other hand, the area sprayed by tractor mounted applications accounted for 14.4% of all applications, whereas 9.1% of all applications were done by methods that were infrequently encountered.

The method of application of plant protection products differs by pesticide and also by crop. Tractor mounted spraying was mainly used for forage crops and vines, where areas under these types of crops tend to be larger than areas with vegetables. In fact the share of tractor mounted spraying for forage and vines amounted to 28.7% and 29.2% of the formulation area sprayed with tractor mounting.

Knapsack spraying was found to be used on potatoes (88.0%), vegetables in the open (78.6%), vegetables under glass (97.1%), and vines (75.1%). The percentage share of knapsack use falls with stone fruit (62.7%) and reaches its lowest with use on forage (51.8%) and citrus areas (47.5%).

Table 16 shows that the majority of the area is treated with fungicides. Whereas 79.8% of all fungicides area applied by knapsack, herbicide treatment via knapsack declines to 56.3%, due to the fact that herbicides are mainly used on forage crops where areas tend to get larger. Insecticide treatment via knapsack amounted to 76.8% as compared to the 13.0% used via ground spray.

5.1.4 Seasonality of plant protection products use

Pesticide usage in Malta follows a typical pattern under a Mediterranean climate. Herbicide applications are mainly used in the beginning of the rainy season, which starts in September, when the weed seeds begin to sprout. The area treated with herbicides reaches its peak in January whereas dry conditions in the April/September season retard weed

growth. Fungicide use occurred throughout the whole season, with the main period of application occurring from April to July. Insecticide use reaches a maximum during the June/July period.

5.1.5 Application rates

The application rate can be defined as the total quantity of active substances by chemical group or category divided by the area treated. The application rates differ both by crop and also by formulation. The application rate of acaricides on average is less than 0.04 kg per hectare, ranging from 0.003 kg per hectare (abamectin) on citrus to a maximum of 0.3 kg per hectare on vines.

Fungicide application rates are the highest with an average of 7.5kg sprayed per hectare. Sulphur dominates this section with an average of 53.4kg per hectare, ranging from 0.9kg per hectare on citrus to 113.3kg per hectare on vegetables grown in the open.

Herbicide application rates centre round MCPA. As this active substance is the dominant herbicide used, the average application rate of 1.2kg per hectare is similar to the application rate of MCPA on forage.

Application rates per hectare for insecticides are negligible, with an average of 0.3kg per hectare, ranging from 0.2kg per hectare on forage crops to 0.4 kg per hectare on vines and citrus fruit.

5.1.6 Usage of individual active substances

Plant protection products may be formulated from a single active substance, as is often the case with insecticides (for example lufenuron), or from two or more active substances, as is frequently found in fungicides (for example mancozeb/cymoxanil). Thus, active substances that occur in a number of different product formulations, for example mancozeb, may be much more commonly used when considered as individual active substances, than may be obvious from a consideration of such product formulations as presented in Tables 22 and 23.

Table 22 lists the total area treated by individual active substances for all the active substances encountered by area treated, together with a cumulative percentage of the active substance area treated. Table 23 similarly lists the most used active substances, ranked by weight applied.

In total, 87 different active substances were encountered, but in most cases they were used very infrequently and on limited areas. For example, sixteen active substances (18.4% of the total active substance list) accounted for 80.0% of the entire active substance treated area. On the other hand, 37 active substances were applied to less than 1% of the total active substance treated area. Furthermore, it was estimated that 28 active substances were applied to areas where the area under the active substance is less than 10 ha.

Nine out of ten of the most important active substances were fungicides, illustrating the importance of disease control over pest or weed control. Because of its frequency of occurrence in many different formulations, the fungicide mancozeb was the most commonly used active substance by area treated, comprising 25.6% of all pesticide treatments. Its use was encountered on all surveyed crops except forage, being particularly important on potatoes, grapes and vegetables grown in the open.

Five other active substances were applied to over 1,000 ha of crop: the fungicides metalaxyl-M, only available in formulation with mancozeb. These active substances are particularly used on potatoes, grapes and vegetables grown in the open. The fifth active substance applied over 1,000 ha of crop is the herbicide MCPA, used mainly on wheat grown for fodder.

The most important insecticides were dimethoate, used predominantly on stone fruit, malathion, used mainly on potatoes, vegetables in the open and stone fruit, and chlorpyrifos, used mainly on vegetables grown in the open, vines and stone fruit. These three active substances were ranked 16th, 18th, and 19th in most used active substances by area treated and combined, accounted for only 4.6% of the total active substance area treated.

By weight applied, plant protection products use in Malta and Gozo was dominated by sulphur, which accounted for 89.5% of all plant protection products use by weight (Table 23), primarily because of the very large rates of application used (Table 19). Approximately 108 tonnes of sulphur was applied to crops, predominantly on vegetables grown in the open and vines. Of the top 10 most important active substances by weight applied, 7 active substances are fungicides, with mancozeb the most important after sulphur because of the large area treated, and accounting for 4.6% of the total weight applied by active substance. In total, 3 active substances accounted for 96.4% of the weight applied by active substance. In addition to sulphur and mancozeb, MCPA, which is mainly used on fodder crops accounted for a further 2.3% of the total weight applied.

The majority of plant protection products were only used in small amounts. In fact, 47 active substances had an estimated use of less than 10 kilograms for each active substance. The ten most important active substances by

weight applied included two insecticides: malathion and carbaryl, together accounting for only 0.4% of the total weight of plant protection products applied with an estimated combined total of 440 kilograms.

5.2 USAGE ON INDIVIDUAL CROPS

5.2.1 Potatoes

During the agricultural year 2006/07, 96.4% of all areas under potato cultivation were treated with a particular pesticide. Fungicide treatment was the most popular treatment with an average of 5.7 treatments. The most popular formulations (Table 17) were mancozeb/metalaxyl-M (35.0%), mancozeb (11.9%), and mancozeb/zoxamide (11.8%).

By weight, 3.2% of all formulations were sprayed on potatoes. In fact, 3.1% of all fungicides were applied to potatoes with the formulation mancozeb/metalaxyl-M (35.9% of all fungicide formulations by weight applied on potatoes) being the most popular.

Herbicide treatment accounted for 13.3% of all potato cultivation. Linuron was the principal formulation used, accounting for 61.2% of all formulation areas with herbicides on potatoes. 7.0% of all herbicide treatment by formulation area was sprayed on potatoes, with Linuron accounting for 86.9% of all active substances applied by weight of herbicides.

Only 6.1% of the cultivated area was treated with insecticides, indicating that pests did not pose a serious threat to potato cultivation. Malathion (53.7% of all formulation area) and Cypermethrin (19.6%) were the dominant products used.

Of all potato areas cultivated, only 3.6% were not treated in the 2006/07 agricultural year.

5.2.2 Fresh vegetables grown in the open

Acaricide use in Maltese agriculture was mainly used in the cultivation of fresh vegetables in the open. In fact 83.3% of the basic area treated with acaricides was sprayed on vegetables grown in the open. Acaricide use only amounted to 11.5% of all vegetables grown. Acaricide use was limited to an average of 2 treatments, mainly tebufenpirad (53.2% of the formulation area of acaricides).

Fungicides were widely used, with 80.3% of the cultivated area treated with some form of fungicides, with an average of 4.5 sprays. By formulation area, fungicides containing sulphur (25.0%), penconazole (15.4%), mancozeb/metalaxyl-M (13.3%) and mancozeb (12.1%) were the dominant formulations.

84.1% of all fungicides by weight were sprayed on fresh vegetables in the open. Sulphur, being the most dominant active substance by weight, accounted for 98.7% of all fungicide formulations sprayed on open field vegetables.

Herbicides were used infrequently with 96.4% of the area cultivated with fruit and vegetables in the open not treated with any herbicides. An average of 1.1 applications were sprayed, the most common being trifluralin amounting to 33.3% of the formulation area under herbicides.

34.1% of the area grown was treated with an insecticide, with an average of 2.6 sprays. By formulation area, the dominant insecticides were deltamethrin (20.4%) and Malathion (19.2%).

13.4% of the entire crop grown under fresh vegetables in the open was not treated. On the other hand, 81.5% of all formulations by weight were sprayed on vegetables in the open.

5.2.3 Fresh vegetables under glass

On all the areas surveyed, fresh vegetables under glass were the only crop to receive treatments on all areas. In fact, 98.7% of all areas surveyed received at least one fungicide treatment, while 57.0 per cent also received at least one insecticide treatment.

On average 11.1 fungicide treatments were sprayed in greenhouses with the formulations mancozeb/metalaxyl-M (23.9%), mancozeb (21.9%), and cyprodinil/fludioxonyl (14.7%) being the most frequent. Fungicide formulations by weight sprayed under glass account for only 1.2% of all fungicide formulations as a consequence of the limited area under glass. By weight, sulphur and mancozeb formulations account for 77.6% and 8.3% of all fungicide formulations sprayed under glass.

Insecticides were the second most important pesticide used with 57.0 per cent of the area receiving at least one treatment. Insecticide treatments on average amounted to 3.1 treatments. Usage was dominated by imidacloprid (38.4%) and acetamiprid (21.8%).

Overall, 1.2% of all plant protection products by formulation weight were applied to crops cultivated under glass.

5.2.4 Forage

Fungicide and Insecticide treatments for the cultivation of fodder crops in Malta is negligible with less than 1% of the entire area grown under fodder crops treated with these types of pesticides.

The only plant protection products of any importance used on wheat were herbicides, with 45.6% of the area grown receiving treatment, comprising mainly of a single application of MCPA (99.0% of all formulations) for broad-leaved weed control. Use of other herbicides were encountered but were considered negligible. In fact, 89.8% of all herbicide applications by weight were sprayed on forage crops, with MCPA being the dominant herbicide sprayed, accounting for 99.7% of all herbicides sprayed on forage crops.

Due to the low prices fetched in the market for fodder crops, 54.4% of the entire crop cultivated did not receive any plant protection products.

5.2.5 Grapes

The dominant pesticides used on grape production were fungicides and insecticides, with fungicide treatment being very important, accounting for 90.8% of the total crop area treated with fungicides. 34 formulations out of a total of 46 formulations were used in fungicide treatment on grapes, the most noticeable being sulphur with 18.2% of all formulations. Other important formulations used on grapes were mancozeb (6.5%), mancozeb/metalaxyl-M (11.4%), mancozeb/metalaxyl (7.4%), Penconazole (7.4%), Zineb (5.4%), mancozeb/cymoxanil (8.3%), and copper oxychloride/copper sulphate (6.0%). These formulations together accounted for 52.4% of all the formulation area sprayed on grapes.

Fungicide formulations by weight account for 11.4% of all fungicide applications. Over 75% of all fungicide formulations sprayed by weight were sulphur.

Insecticide treatment amounted to 31% of all areas under vines. On average 2.9 sprays of insecticides were applied. The most commonly used formulations were carbaryl (40.7%), chlorpyrifos (21.4%) and lufenuron (17.9%). Together, these formulations amounted to 80% of the formulation area used with insecticides.

Herbicide treatment was infrequently used, with only 4.5% of the total area grown receiving some form of herbicide treatment. Only two types of formulation were used, the most dominant being MCPA (89.0%). On average, 1 spray was given with herbicides.

By area of formulation, areas under vines amounted to 7,118.3 ha or 33.2% of the total formulation area. This is mainly due to the intensity of treatment applied to vines.

In general, 91.6% of all the areas cultivated with vines were treated with some form of pesticide.

5.2.6 Citrus fruit

Fungicide use was not as important on citrus crops as with other crops grown in Malta. Only 45.5% of the area grown received some form of treatment.

The majority of pesticides used were insecticides. On average 5 applications were sprayed. The most important formulations sprayed were chlorpyrifos (26.6%), deltamethrin (23.6%), dimethoate (25.6%), and imidacloprid (14.7%). These four formulations accounted for 90.6% of the formulation area under citrus.

Fungicide treatment accounted for only 2.5% of the crop cultivated. On average, 8.8 sprays were encountered with 96.3% of the formulation area being sprayed with thiophanate-methyl.

No herbicide use was encountered around surveyed citrus trees.

Overall, more than half of the areas under citrus (54.5%) were grown without the use of any plant protection products.

Citrus fruit formulations sprayed by weight resulted in only 0.5% of the total formulations sprayed. 93.8% of all formulations sprayed by weight on citrus resulted from insecticide use. The most dominant being insecticide being chlorpyrifos (64.7% of all insecticide formulations sprayed).

5.2.7 Stone fruit

Insecticide use is the dominant pesticide that is used on stone fruit in Malta. 87.1% of the area grown under stone fruit is treated with any particular plant protection product. Insecticide use dominates with 78.8% of the area grown treated with insecticides.

Stone fruit, on average, were sprayed 4.4 times with insecticides, with the most important formulation being dimethoate (41.4%). Other major applications include malathion (15.0%), deltamethrin (12.3%), and cypermethrin (12.2%).

Herbicide treatment on stone fruit is minimal with less than 1% of the area cultivated with stone fruit treated for weeds.

Fungicide treatment accounts for 33.4% of the area cultivated. On average, fungicides were applied 2.6 times with ziram being the most important formulation (49.4% of all formulations). Copper, being the second most important formulation amounted to 14.1% of all fungicide formulations.

As was the case of citrus fruit, only 0.5% of all formulations by weight were sprayed on stone fruit. 50.9% of all formulations sprayed on stone fruit were insecticide formulations, with 50.1% of all insecticides being dimethoate. On the other hand, 43.6% of all formulations sprayed on stone fruit were fungicide formulations with ziram accounting for 82.6% of all fungicide formulations by weight.

Table 11. Areas (ha) surveyed for plant protection products (PPP's)

	Total area surveyed (ha)	Total cultivated area¹	Areas not analysed for PPP's (ha)	% areas analysed
Total	10,343.7	8,100.5	1,917.6	78.3%
Potatoes	926.1	926.1	-	100.0%
Fresh vegetables in the open	1,938.2	954.5	983.8	49.2%
Plants and flowers grown in the open	77.4	-	77.4	0.0%
Fresh vegetables under glass	61.7	49.6	12.1	80.4%
Set-aside areas	844.3	-	844.3	0.0%
Forage	5,004.2	5,004.2	-	100.0%
Vines	829.0	829.0	-	100.0%
Citrus fruit	62.9	62.9	-	100.0%
Stone fruit	599.8	274.2	-	45.7%

¹Total cultivated area refer to those areas laid out in the questionnaire as being relevant for PPP usage in Malta. Negligible areas were not taken into consideration and are included under areas not analysed.

Table 12. Basic area (ha)¹ treated by chemical family by crop

	Total	Potatoes	Fresh vegetables in the open	Fresh vegetables under glass	Forage	Vines	Citrus fruit	Stone fruit
Acaricides	131.6	-	109.6	8.6	-	10.8	0.3	2.3
Additives	18.3	-	-	-	-	13.6	-	4.7
Fungicides	2,547.2	885.6	766.2	49.0	0.7	752.6	1.6	91.6
Herbicides	2,470.7	123.1	29.5	-	2,281.0	36.9	-	0.2
Insecticides	911.5	56.4	325.6	28.3	0.1	256.7	28.3	216.1
Soil sterilants	13.6	-	-	-	-	13.6	-	-
Any PPP's	5,077.6	893.1	826.4	49.6	2,281.7	759.4	28.6	238.7
Total cultivated area	8,100.5	926.1	954.5	49.6	5,004.2	829.0	62.9	274.2

¹Basic area = the field area of crop receiving treatment, irrespective of the number of times it may have been treated

Table 13. Basic area (ha) treated by chemical family as a percentage of the total cultivated area (ha)

	Total	Potatoes	Fresh vegetables in the Open	Fresh vegetables under Glass	Forage	Vines	Citrus fruit	Stone fruit
Acaricides	1.6%	-	11.5%	17.3%	-	1.3%	0.5%	0.8%
Additives	0.2%	-	-	-	-	1.6%	-	1.7%
Fungicides	31.4%	95.6%	80.3%	98.7%	0.0%	90.8%	2.5%	33.4%
Herbicides	30.5%	13.3%	3.1%	-	45.6%	4.5%	-	0.1%
Insecticides	11.3%	6.1%	34.1%	57.0%	0.0%	31.0%	44.9%	78.8%
Soil sterilants	0.2%	-	-	-	-	1.6%	-	-
Any PPP's	62.7%	96.4%	86.6%	100.0%	45.6%	91.6%	45.5%	87.1%

Table 14. Average number of applications by chemical family

	Total	Potatoes	Fresh vegetables in the Open	Fresh vegetables under Glass	Forage	Vines	Citrus fruit	Stone fruit
Acaricides	2.1	-	2.0	4.8	-	1.0	1.0	1.4
Additives	1.4	-	-	-	-	1.0	-	2.5
Fungicides	6.1	5.7	4.5	11.1	1.0	8.3	8.8	2.6
Herbicides	1.0	1.5	1.1	-	1.0	1.0	-	1.0
Insecticides	3.3	4.1	2.6	3.1	1.0	2.9	5.0	4.4
Soil sterilants	5.0	-	-	-	-	5.0	-	-

Table 15. Formulation area (ha) treated by crop and application method

	Total	Granular broadcast	Granular incorporated	Ground spray	Knap sack	Other
All crops	21,434.0	173.0	49.7	3,087.7	16,390.3	1,733.3
Potatoes	5,482.6	4.5	-	615.4	4,829.8	32.9
Fresh vegetables in the open	4,506.9	153.7	49.7	317.1	3,543.5	442.8
Fresh vegetables under glass	673.7	0.1	-	15.6	654.3	3.7
Forage	2,292.5	-	-	887.2	1,186.5	218.7
Vines	7,118.3	14.7	-	902.0	5,347.1	854.6
Citrus fruit	154.6	-	-	46.0	73.4	35.2
Stone fruit	1,205.4	-	-	304.3	755.8	145.3

Table 16. Formulation area (ha) treated by chemical family and application method

	Total	Granular broadcast	Granular incorporated	Ground spray	Knap sack	Other
All PPP's	21,434.0	173.0	49.7	3,087.7	16,390.3	1,733.3
Acaricides	271.5	-	-	5.3	266.2	-
Additives	25.5	-	-	10.2	1.7	13.6
Fungicides	15,523.9	173.0	49.7	1,787.9	12,386.7	1,126.6
Herbicides	2,539.6	-	-	892.3	1,428.6	218.7
Insecticides	3,005.4	-	-	392.0	2,307.2	306.3
Soil sterilants	68.0	-	-	-	-	68.0

Chart 4. Formulation area (ha) by month of application

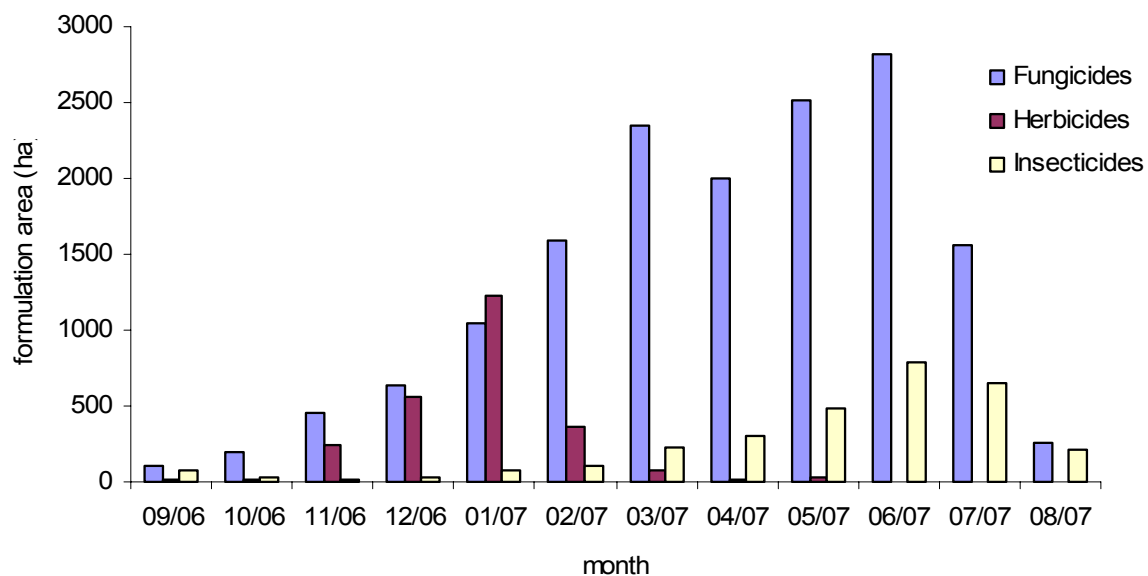


Chart 5. Weight of substances by chemical family (kg) by month of application

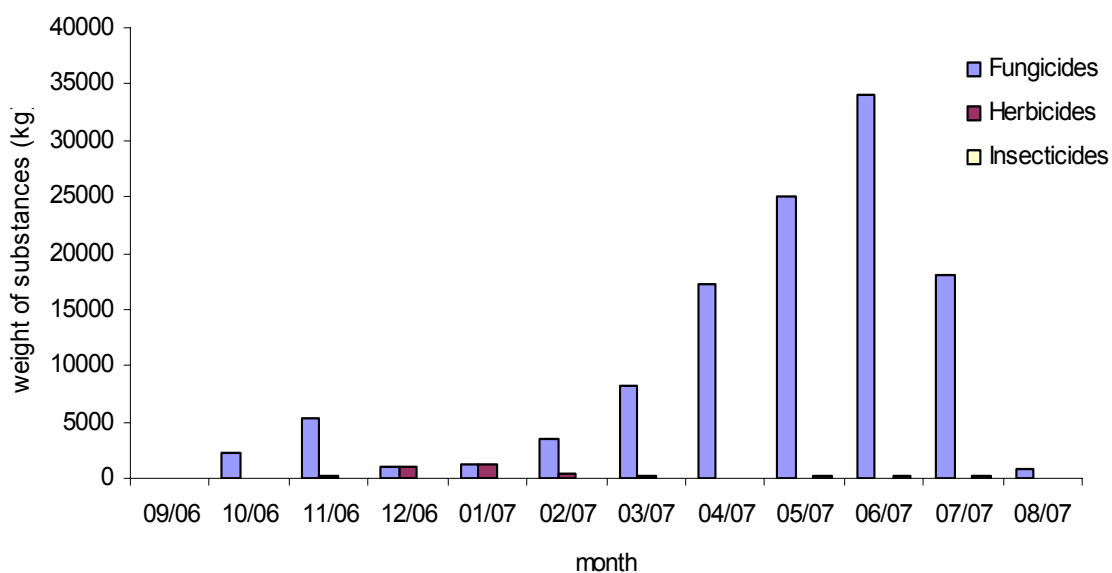


Table 17. Formulation area (ha) treated by crop

	Total	Potatoes	Fresh vegetables in the open	Fresh vegetables under glass	Forage	Vines	Citrus fruit	Stone fruit
Acaricides	271.5	-	216.3	41.0	-	10.8	0.3	3.1
Abamectin	68.6	-	27.0	39.8	-	-	0.3	1.5
Acrinathrin	0.5	-	0.1	0.4	-	-	-	-
Dicofol	17.0	-	6.2	-	-	10.8	-	-
Fenazaquin	2.7	-	2.7	-	-	-	-	-
Hexythiazox	36.7	-	35.8	0.9	-	-	-	-
Propargite	30.9	-	29.3	-	-	-	-	1.6
Tebufenpyrad	115.1	-	115.1	-	-	-	-	-
Additives	25.5	-	-	-	-	13.6	-	11.9
Mineral Oil	25.5	-	-	-	-	13.6	-	11.9
Fungicides	15,523.9	5,072.3	3,413.2	545.0	0.7	6,244.6	13.9	234.3
Azoxystrobin	28.4	6.0	10.3	2.2	-	9.9	-	-
Bromuconazole	7.1	-	7.1	-	-	-	-	-
Bupirimate	9.0	-	6.8	2.2	-	-	-	-
Captan	0.2	-	-	0.2	-	-	-	-
Carbendazim	187.5	-	10.7	7.9	-	150.6	-	18.3
Chlorothalonil	183.9	104.0	72.4	6.7	-	0.8	-	-
Chlorothalonil / Propamocarb	436.9	282.4	108.3	43.8	-	2.4	-	-
Copper	56.5	23.5	-	-	-	-	-	33.0
Copper / Cymoxanil	10.3	-	10.3	-	-	-	-	-
Copper Hydroxide	5.5	-	-	-	-	5.5	-	-
Copper Oxychloride	159.2	64.5	72.2	-	-	11.0	-	11.4
Copper Oxychloride / Copper Sulfate	457.9	67.8	16.2	-	-	372.1	-	1.7
Copper Sulfate	113.7	6.9	19.1	-	-	87.7	-	-
Cymoxanil	495.7	477.1	2.9	6.5	-	9.1	-	-
Cymoxanil / Famoxadone	123.7	24.9	8.5	15.0	-	75.3	-	-
Cyprodinil / Fludioxonil	140.7	-	14.8	80.0	-	45.9	-	-
Diclofluanid	114.5	6.0	10.1	0.2	-	98.2	-	-
Difenoconazole	48.2	-	47.4	0.8	-	-	-	-
Dithianon	3.2	3.1	0.1	-	-	-	-	-
Dodine	1.0	1.0	-	-	-	-	-	-

Table 17. Formulation area (ha) treated by crop

	Total	Potatoes	Fresh vegetables in the open	Fresh vegetables under glass	Forage	Vines	Citrus fruit	Stone fruit
Fungicides cont....								
Folpet	0.3	-	-	0.3	-	-	-	-
Fosetyl-Aluminium / Folpet	532.2	315.5	33.5	2.9	-	178.8	-	1.5
Iprodione	5.7	-	-	2.1	-	3.6	-	-
Mancozeb	1,538.9	603.8	411.5	119.5	-	404.1	-	-
Mancozeb / Benalaxyl	739.5	346.5	133.0	18.5	-	236.5	0.1	4.8
Mancozeb / Cymoxanil	768.5	155.1	83.4	2.4	-	519.1	-	8.4
Mancozeb / Metalaxyl	474.0	-	9.9	-	-	464.1	-	-
Mancozeb / Metalaxyl-M	3,076.4	1,775.9	455.0	130.5	-	711.4	-	3.7
Mancozeb / Sulphur	128.8	-	5.2	-	-	123.6	-	-
Mancozeb / Zoxamide	715.5	600.8	20.5	5.9	-	88.2	-	-
Myclobutanil	344.4	-	64.0	0.1	-	280.3	-	-
Micronized Sulfur	70.3	-	-	-	-	70.3	-	-
Oxadixyl	6.3	-	0.2	0.8	-	5.3	-	-
Penconazole	1,041.1	3.8	527.0	45.6	-	461.4	-	3.3
Procymidone	247.3	-	-	18.7	-	228.6	-	-
Propamocarb	27.9	19.9	6.2	1.0	-	0.8	-	-
Propineb	84.2	0.6	83.6	-	-	-	-	-
Sulphur	2,020.6	0.4	854.4	30.8	0.7	1,133.8	0.5	-
Thiophanate-methyl	296.2	44.6	214.1	-	-	2.1	13.4	22.0
Thiram	4.4	1.0	-	-	-	3.5	-	-
Triadimenol	134.4	-	18.9	0.2	-	115.4	-	-
Trifloxystrobin	5.6	-	-	-	-	5.6	-	-
Triforine	3.3	-	3.3	-	-	-	-	-
Zineb	552.9	137.2	65.8	-	-	339.3	-	10.6
Zineb / Sulphur	1.5	-	1.5	-	-	-	-	-
Ziram	120.7	-	4.7	-	-	0.3	-	115.7

Table 17. Formulation area (ha) treated by crop

	Total	Potatoes	Fresh vegetables in the open	Fresh vegetables under glass	Forage	Vines	Citrus fruit	Stone fruit
Herbicides	2,539.6	179.0	31.8	-	2,291.6	36.9	-	0.2
Bentazon	11.5	-	-	-	11.5	-	-	-
Diquat	33.0	33.0	-	-	-	-	-	-
Glufosinate ammonium	4.4	4.4	-	-	-	-	-	-
Glyphosate	43.2	26.0	0.7	-	12.1	4.1	-	0.2
Linuron	117.3	109.5	7.8	-	-	-	-	-
MCPA	2,306.1	5.3	-	-	2,268.0	32.8	-	-
Metribuzin	4.5	0.7	3.8	-	-	-	-	-
Oxyfluorfen	4.3	-	4.3	-	-	-	-	-
Pendimethalin	1.5	0.1	1.5	-	-	-	-	-
Propachlor	3.2	-	3.2	-	-	-	-	-
Trifluralin	10.6	-	10.6	-	-	-	-	-
Insecticides	3,005.4	231.3	845.6	87.7	0.1	744.5	140.4	955.9
Acetamiprid	74.3	-	50.3	19.1	0.1	-	-	4.7
Bacillus Thuringiensis	1.7	-	-	1.7	-	-	-	-
Bifenthrin	31.2	16.8	12.6	-	-	-	-	1.7
Buprofezin	0.9	-	0.7	0.2	-	-	-	-
Carbaryl	360.9	10.3	46.9	-	-	303.0	0.2	0.5
Chlorpyrifos	401.5	25.4	81.0	1.7	-	159.1	37.4	96.9
Chlorpyrifos-methyl	43.7	-	31.0	3.1	-	9.5	-	0.1
Chlorpyrifos-Methyl / Cypermethrin	1.8	-	0.5	-	-	-	-	1.3
Cypermethrin	250.8	45.4	5.0	-	-	84.2	-	116.2
Cyromazine	3.9	-	3.3	0.7	-	-	-	-
Deltamethrin	347.8	-	172.6	1.9	-	22.6	33.2	117.5
Diafenthiuron	0.2	-	-	0.2	-	-	-	-
Dimethoate	473.7	4.0	36.2	-	-	2.2	36.0	395.4
Etofenprox	19.1	-	0.5	-	-	8.3	-	10.3
Imidacloprid	115.7	-	56.4	33.7	-	4.9	20.6	-
Lufenuron	252.2	2.6	92.3	12.0	-	133.3	-	12.0
Malathion	448.4	124.1	162.5	-	-	12.8	5.4	143.7
Permethrin	29.4	2.6	12.7	0.2	-	-	-	13.9
Phenthoate	56.5	-	6.5	-	-	3.8	7.6	38.6
Piperonyl Butoxide / Pyrethrins	3.2	-	-	-	-	-	-	3.2

Table 17. Formulation area (ha) treated by crop

	Total	Potatoes	Fresh vegetables in the open	Fresh vegetables under glass	Forage	Vines	Citrus fruit	Stone fruit
Insecticides cont								
Profenofos	3.9	-	3.9	-	-	-	-	-
Pymetrozine	17.8	-	11.8	6.0	-	-	-	-
Spinosad	4.5	-	0.7	3.8	-	-	-	-
Thiacloprid	20.9	-	19.6	1.3	-	-	-	-
Thiamethoxam	4.5	-	2.3	2.2	-	-	-	-
Trichlorfon	37.0	-	36.1	-	-	0.8	-	-
Soil sterilants	68.0	-	-	-	-	68.0	-	-
Metam-Sodium	68.0	-	-	-	-	68.0	-	-

Table 18. Weight (kg) of active substance by formulation by crop

	Total	Potatoes	Fresh vegetables in the open	Fresh vegetables under glass	Forage	Vines	Citrus fruit	Stone fruit
Acaricides	12.0	-	8.6	0.4	-	2.8	0.0	0.3
Abamectin	0.5	-	0.2	0.3	-	-	0.0	0.1
Acrinathrin	0.0	-	0.0	0.0	-	-	-	-
Dicofol	2.9	-	0.1	-	-	2.8	-	-
Fenazaquin	0.3	-	0.3	-	-	-	-	-
Hexythiazox	1.4	-	1.3	0.1	-	-	-	-
Propargite	5.0	-	4.7	-	-	-	-	0.3
Tebufenpyrad	1.9	-	1.9	-	-	-	-	-
Additives	49.4	-	-	-	-	17.1	-	32.3
Mineral Oil	49.4	-	-	-	-	17.1	-	32.3
Fungicides	116,721.1	3,639.7	98,123.5	1,380.4	1.7	13,312.1	3.4	260.3
Azoxystrobin	6.2	1.3	2.5	0.6	-	1.8	-	-
Bromuconazole	0.0	-	0.0	-	-	-	-	-
Bupirimate	2.3	-	2.0	0.2	-	-	-	-
Captan	0.1	-	-	0.1	-	-	-	-
Carbendazim	49.2	-	2.2	1.2	-	43.1	-	2.7
Chlorothalonil	121.6	72.7	41.7	7.2	-	0.1	-	-
Chlorothalonil / Propamocarb	332.5	247.8	46.9	36.4	-	1.5	-	-
Copper	16.7	5.7	-	-	-	-	-	11.0
Copper / Cymoxanil	1.9	-	1.9	-	-	-	-	-
Copper Hydroxide	2.6	-	-	-	-	2.6	-	-
Copper Oxychloride	83.0	6.7	59.8	-	-	8.8	-	7.6
Copper Oxychloride / Copper Sulfate	241.1	44.2	5.3	-	-	191.3	-	0.3
Copper Sulfate	39.3	3.3	14.1	-	-	21.9	-	-
Cymoxanil	117.8	113.3	0.9	1.6	-	2.0	-	-
Cymoxanil / Famoxadone	15.8	1.9	0.7	1.9	-	11.3	-	-
Cyprodinil / Fludioxonil	38.3	-	1.4	25.7	-	11.2	-	-
Diclofluanid	126.1	4.0	6.0	0.1	-	116.0	-	-
Difenoconazole	4.6	-	4.3	0.3	-	-	-	-
Dithianon	2.7	2.7	0.0	-	-	-	-	-
Dodine	0.3	0.3	-	-	-	-	-	-

Table 18. Weight (kg) of active substance by formulation by crop

	Total	Potatoes	Fresh vegetables in the open	Fresh vegetables under glass	Forage	Vines	Citrus fruit	Stone fruit
Fungicides cont								
Folpet	0.1	-	-	0.1	-	-	-	-
Fosetyl-Aluminium / Folpet	486.4	287.2	35.6	5.0	-	156.4	-	2.1
Iprodione	2.9	-	-	1.4	-	1.5	-	-
Mancozeb	1,882.9	748.7	347.9	115.1	-	671.3	-	-
Mancozeb / Benalaxyl	852.2	382.7	95.0	16.1	-	354.5	0.1	3.9
Mancozeb / Cymoxanil	389.7	81.6	48.6	0.8	-	255.9	-	2.8
Mancozeb / Metalaxyl	260.3	-	4.2	-	-	256.1	-	-
Mancozeb / Metalaxyl-M	2,291.3	1,306.5	368.6	74.1	-	540.0	-	2.2
Mancozeb / Sulphur	63.4	-	1.0	-	-	62.4	-	-
Mancozeb / Zoxamide	249.8	182.6	6.2	9.8	-	51.4	-	-
Myclobutanil	34.9	-	5.3	0.0	-	29.5	-	-
Micronized Sulfur	75.8	-	-	-	-	75.8	-	-
Oxadixyl	26.7	-	0.0	0.2	-	26.4	-	-
Penconazole	33.8	0.1	17.1	1.7	-	14.8	-	0.1
Procymidone	140.3	-	-	8.3	-	132.0	-	-
Propamocarb	10.7	3.0	7.0	0.7	-	0.1	-	-
Propineb	57.7	1.0	56.7	-	-	-	-	-
Sulphur	107,943.8	0.4	96,805.9	1,071.8	1.7	10,063.5	0.4	-
Thiophanate-methyl	72.3	11.8	54.6	-	-	0.5	2.9	2.5
Thiram	3.2	1.1	-	-	-	2.1	-	-
Triadimenol	12.4	-	0.5	0.0	-	11.9	-	-
Trifloxystrobin	0.1	-	-	-	-	0.1	-	-
Triforine	0.4	-	0.4	-	-	-	-	-
Zineb	397.4	129.2	63.8	-	-	194.4	-	10.1
Zineb / Sulphur	0.2	-	0.2	-	-	-	-	-
Ziram	230.3	-	15.0	-	-	0.1	-	215.1

Table 18. Weight (kg) of active substance by formulation by crop

	Total	Potatoes	Fresh vegetables in the open	Fresh vegetables under glass	Forage	Vines	Citrus fruit	Stone fruit
Herbicides	2,957.6	191.1	29.1	-	2,657.1	80.1	-	0.2
Bentazon	4.8	-	-	-	4.8	-	-	-
Diquat	9.4	9.4	-	-	-	-	-	-
Glufosinate ammonium	0.7	0.7	-	-	-	-	-	-
Glyphosate	22.6	11.9	0.4	-	4.3	5.9	-	0.2
Linuron	174.1	166.0	8.1	-	-	-	-	-
MCPA	2,724.5	2.2	-	-	2,648.0	74.2	-	-
Metribuzin	1.1	0.8	0.3	-	-	-	-	-
Oxyfluorfen	2.4	-	2.4	-	-	-	-	-
Pendimethalin	8.3	0.0	8.2	-	-	-	-	-
Propachlor	1.3	-	1.3	-	-	-	-	-
Trifluralin	8.4	-	8.4	-	-	-	-	-
Insecticides	918.3	73.1	174.2	18.2	0.0	297.4	51.5	303.9
Acetamiprid	2.0	-	1.4	0.5	0.0	-	-	0.1
Bacillus Thuringiensis	0.3	-	-	0.3	-	-	-	-
Bifenthrin	0.7	0.1	0.0	-	-	-	-	0.6
Buprofezin	0.1	-	0.1	0.0	-	-	-	-
Carbaryl	228.6	10.2	9.0	-	-	209.1	0.1	0.2
Chlorpyrifos	185.8	6.1	33.6	0.6	-	46.4	33.3	65.8
Chlorpyrifos-methyl	6.3	-	2.3	0.3	-	3.6	-	0.0
Chlorpyrifos-Methyl / Cypermethrin	0.1	-	0.0	-	-	-	-	0.1
Cypermethrin	25.7	2.0	0.3	-	-	10.4	-	13.0
Cyromazine	0.6	-	0.4	0.3	-	-	-	-
Deltamethrin	3.1	-	1.5	0.0	-	0.5	0.1	1.0
Diafenthiuron	0.0	-	-	0.0	-	-	-	-
Dimethoate	176.4	0.3	9.6	-	-	0.0	14.3	152.1
Etofenprox	2.6	-	0.1	-	-	0.6	-	1.9
Imidacloprid	7.1	-	5.0	1.9	-	0.1	0.2	-
Lufenuron	6.3	0.1	2.7	0.3	-	3.0	-	0.2
Malathion	211.6	54.0	76.7	-	-	13.3	3.0	64.7
Permethrin	1.2	0.3	0.4	0.2	-	-	-	0.3
Phenthoate	5.0	-	0.3	-	-	0.4	0.5	3.8
Piperonyl Butoxide / Pyrethrins	0.2	-	-	-	-	-	-	0.2

Table 18. Weight (kg) of active substance by formulation by crop

	Total	Potatoes	Fresh vegetables in the open	Fresh vegetables under glass	Forage	Vines	Citrus fruit	Stone fruit
Insecticides cont								
Profenofos	0.7	-	0.7	-	-	-	-	-
Pymetrozine	3.7	-	2.3	1.3	-	-	-	-
Spinosad	0.9	-	0.1	0.8	-	-	-	-
Thiacloprid	1.0	-	0.8	0.2	-	-	-	-
Thiamethoxam	11.6	-	0.1	11.5	-	-	-	-
Trichlorfon	36.6	-	26.7	-	-	9.9	-	-
Soil sterilants	71.2	-	-	-	-	71.2	-	-
Metam-Sodium	71.2	-	-	-	-	71.2	-	-

Table 19. Average quantity applied per basic area treated (kg/ha) by formulation by crop

	Total	Potatoes	Fresh vegetables in the open	Fresh vegetables under glass	Forage	Vines	Citrus fruit	Stone fruit
Acaricides	0.1	-	0.1	0.0	-	0.3	0.0	0.1
Abamectin	0.0	-	0.0	0.0	-	-	0.0	0.0
Acrinathrin	0.0	-	0.0	0.0	-	-	-	-
Dicofol	0.2	-	0.0	-	-	0.3	-	-
Fenazaquin	0.2	-	0.2	-	-	-	-	-
Hexythiazox	0.0	-	0.0	0.1	-	-	-	-
Propargite	0.2	-	0.2	-	-	-	-	0.3
Tebufenpyrad	0.0	-	0.0	-	-	-	-	-
Additives	2.7	-	-	-	-	1.3	-	6.9
Mineral Oil	2.7	-	-	-	-	1.3	-	6.9
Fungicides	24.9	2.6	83.2	11.6	2.4	7.1	2.2	2.3
Azoxystrobin	0.5	0.9	0.9	0.5	-	0.3	-	-
Bromuconazole	0.0	-	0.0	-	-	-	-	-
Bupirimate	0.6	-	0.6	0.4	-	-	-	-
Captan	0.4	-	-	0.4	-	-	-	-
Carbendazim	1.1	-	0.4	1.4	-	1.2	-	0.7
Chlorothalonil	1.8	1.8	1.6	3.9	-	0.1	-	-
Chlorothalonil / Propamocarb	2.1	2.1	1.4	4.1	-	0.6	-	-
Copper	0.7	0.9	-	-	-	-	-	0.7
Copper / Cymoxanil	0.9	-	0.9	-	-	-	-	-
Copper Hydroxide	0.5	-	-	-	-	0.5	-	-
Copper Oxychloride	1.7	0.7	2.9	-	-	1.3	-	0.7
Copper Oxychloride / Copper Sulfate	2.2	1.8	1.2	-	-	2.4	-	0.2
Copper Sulfate	1.0	0.8	2.2	-	-	0.7	-	-
Cymoxanil	0.9	1.0	0.6	0.4	-	0.3	-	-
Cymoxanil / Famoxadone	0.6	0.4	0.2	0.6	-	0.8	-	-
Cyprodinil / Fludioxonil	1.0	-	0.3	1.8	-	0.6	-	-
Diclofluanid	4.7	2.0	1.8	0.8	-	5.5	-	-
Difenoconazole	0.3	-	0.3	0.5	-	-	-	-
Dithianon	1.6	1.7	0.3	-	-	-	-	-
Dodine	0.3	0.3	-	-	-	-	-	-

Table 19. Average quantity applied per basic area treated (kg/ha) by formulation by crop

	Total	Potatoes	Fresh vegetables in the open	Fresh vegetables under glass	Forage	Vines	Citrus fruit	Stone fruit
Fungicides cont								
Folpet	0.6	-	-	0.6	-	-	-	-
Fosetyl-Aluminium / Folpet	2.8	2.7	2.6	4.8	-	3.0	-	1.4
Iprodione	0.7	-	-	1.9	-	0.4	-	-
Mancozeb	4.5	4.5	2.8	7.5	-	6.0	-	-
Mancozeb / Benalaxyl	2.6	2.7	1.4	2.2	-	3.6	5.7	1.2
Mancozeb / Cymoxanil	1.7	2.0	1.7	1.1	-	1.7	-	0.7
Mancozeb / Metalaxyl	2.8	-	0.8	-	-	3.0	-	-
Mancozeb / Metalaxyl-M	2.5	2.7	2.2	2.3	-	2.3	-	1.2
Mancozeb / Sulphur	0.9	-	0.3	-	-	0.9	-	-
Mancozeb / Zoxamide	2.0	2.2	1.4	3.0	-	1.5	-	-
Myclobutanil	0.3	-	0.2	0.2	-	0.4	-	-
Micronized Sulfur	2.4	-	-	-	-	2.4	-	-
Oxadixyl	4.6	-	0.2	0.9	-	5.0	-	-
Penconazole	0.1	0.1	0.1	0.2	-	0.1	-	0.0
Procymidone	2.2	-	-	1.5	-	2.2	-	-
Propamocarb	1.4	0.7	2.5	2.0	-	0.3	-	-
Propineb	2.8	4.7	2.8	-	-	-	-	-
Sulphur	140.1	1.0	238.0	196.7	2.4	28.2	1.8	-
Thiophanate-methyl	2.8	3.7	3.5	-	-	0.2	2.2	0.7
Thiram	0.7	1.1	-	-	-	0.6	-	-
Triadimenol	0.4	-	0.1	0.0	-	0.4	-	-
Trifloxystrobin	0.0	-	-	-	-	0.0	-	-
Triforine	0.5	-	0.5	-	-	-	-	-
Zineb	2.2	2.9	2.6	-	-	1.9	-	2.7
Zineb / Sulphur	0.3	-	0.3	-	-	-	-	-
Ziram	3.8	-	9.6	-	-	1.0	-	3.7

Table 19. Average quantity applied per basic area treated (kg/ha) by formulation by crop

	Total	Potatoes	Fresh vegetables in the open	Fresh vegetables under glass	Forage	Vines	Citrus fruit	Stone fruit
Herbicides	1.2	1.1	1.0	-	1.2	2.2	-	0.9
Bentazon	0.4	-	-	-	0.4	-	-	-
Diquat	0.3	0.3	-	-	-	-	-	-
Glufosinate ammonium	0.2	0.2	-	-	-	-	-	-
Glyphosate	0.5	0.5	1.6	-	0.4	1.4	-	0.9
Linuron	1.5	1.5	1.1	-	-	-	-	-
MCPA	1.2	0.4	-	-	1.2	2.3	-	-
Metribuzin	0.2	1.1	0.1	-	-	-	-	-
Oxyfluorfen	0.7	-	0.7	-	-	-	-	-
Pendimethalin	5.4	0.5	5.6	-	-	-	-	-
Propachlor	0.4	-	0.4	-	-	-	-	-
Trifluralin	0.8	-	0.8	-	-	-	-	-
Insecticides	0.8	1.3	0.5	0.4	0.0	1.0	1.1	0.9
Acetamiprid	0.0	-	0.0	0.0	0.0	-	-	0.0
Bacillus Thuringiensis	0.5	-	-	0.5	-	-	-	-
Bifenthrin	0.1	0.0	0.0	-	-	-	-	0.4
Buprofezin	0.1	-	0.1	0.1	-	-	-	-
Carbaryl	1.2	2.1	0.2	-	-	1.4	0.4	0.5
Chlorpyrifos	1.6	1.0	1.3	1.2	-	0.7	11.1	3.7
Chlorpyrifos-methyl	0.4	-	0.2	0.3	-	1.1	-	0.2
Chlorpyrifos-Methyl / Cypermethrin	0.1	-	0.1	-	-	-	-	0.1
Cypermethrin	0.4	0.2	0.1	-	-	0.6	-	0.4
Cyromazine	0.2	-	0.1	0.7	-	-	-	-
Deltamethrin	0.0	-	0.0	0.0	-	0.1	0.0	0.0
Diafenthion	0.1	-	-	0.1	-	-	-	-
Dimethoate	1.1	0.3	0.7	-	-	0.0	1.1	1.1
Etofenprox	0.1	-	0.2	-	-	0.1	-	0.2
Imidacloprid	0.2	-	0.4	0.1	-	0.0	0.0	-
Lufenuron	0.1	0.1	0.1	0.1	-	0.1	-	0.1
Malathion	1.1	1.8	1.0	-	-	2.3	1.7	0.8
Permethrin	0.2	0.5	0.1	2.2	-	-	-	0.1
Phenthoate	0.2	-	0.1	-	-	0.1	0.1	0.2
Piperonyl Butoxide / Pyrethrins	0.1	-	-	-	-	-	-	0.1

Table 19. Average quantity applied per basic area treated (kg/ha) by formulation by crop

	Total	Potatoes	Fresh vegetables in the open	Fresh vegetables under glass	Forage	Vines	Citrus fruit	Stone fruit
Insecticides cont								
Profenofos	0.4	-	0.4	-	-	-	-	-
Pymetrozine	0.5	-	0.4	1.2	-	-	-	-
Spinosad	0.4	-	0.2	0.4	-	-	-	-
Thiacloprid	0.1	-	0.1	0.3	-	-	-	-
Thiamethoxam	3.0	-	0.1	5.3	-	-	-	-
Trichlorfon	4.5	-	3.7	-	-	11.7	-	-
Soil sterilants	5.2	-	-	-	-	5.2	-	-
Metam-Sodium	5.2	-	-	-	-	5.2	-	-

Table 20. Average quantity applied per formulation area treated (kg/ha) by formulation by crop

	Total	Potatoes	Fresh vegetables in the open	Fresh vegetables under glass	Forage	Vines	Citrus fruit	Stone fruit
Acaricides	0.0	-	0.0	0.0	-	0.3	0.0	0.1
Abamectin	0.0	-	0.0	0.0	-	-	0.0	0.0
Acrinathrin	0.0	-	0.0	0.0	-	-	-	-
Dicofol	0.2	-	0.0	-	-	0.3	-	-
Fenazaquin	0.1	-	0.1	-	-	-	-	-
Hexythiazox	0.0	-	0.0	0.1	-	-	-	-
Propargite	0.2	-	0.2	-	-	-	-	0.2
Tebufenpyrad	0.0	-	0.0	-	-	-	-	-
Additives	1.9	-	-	-	-	1.3	-	2.7
Mineral Oil	1.9	-	-	-	-	1.3	-	2.7
Fungicides	7.5	0.7	28.7	2.5	2.4	2.1	0.2	1.1
Azoxystrobin	0.2	0.2	0.2	0.3	-	0.2	-	-
Bromuconazole	0.0	-	0.0	-	-	-	-	-
Bupirimate	0.3	-	0.3	0.1	-	-	-	-
Captan	0.4	-	-	0.4	-	-	-	-
Carbendazim	0.3	-	0.2	0.2	-	0.3	-	0.1
Chlorothalonil	0.7	0.7	0.6	1.1	-	0.1	-	-
Chlorothalonil / Propamocarb	0.8	0.9	0.4	0.8	-	0.6	-	-
Copper	0.3	0.2	-	-	-	-	-	0.3
Copper / Cymoxanil	0.2	-	0.2	-	-	-	-	-
Copper Hydroxide	0.5	-	-	-	-	0.5	-	-
Copper Oxychloride	0.5	0.1	0.8	-	-	0.8	-	0.7
Copper Oxychloride / Copper Sulfate	0.5	0.7	0.3	-	-	0.5	-	0.2
Copper Sulfate	0.3	0.5	0.7	-	-	0.2	-	-
Cymoxanil	0.2	0.2	0.3	0.2	-	0.2	-	-
Cymoxanil / Famoxadone	0.1	0.1	0.1	0.1	-	0.1	-	-
Cyprodinil / Fludioxonil	0.3	-	0.1	0.3	-	0.2	-	-
Diclofluanid	1.1	0.7	0.6	0.8	-	1.2	-	-
Difenoconazole	0.1	-	0.1	0.4	-	-	-	-
Dithianon	0.8	0.9	0.3	-	-	-	-	-
Dodine	0.3	0.3	-	-	-	-	-	-

Table 20. Average quantity applied per formulation area treated (kg/ha) by formulation by crop

	Total	Potatoes	Fresh vegetables in the open	Fresh vegetables under glass	Forage	Vines	Citrus fruit	Stone fruit
Fungicides cont								
Folpet	0.6	-	-	0.6	-	-	-	-
Fosetyl-Aluminium / Folpet	0.9	0.9	1.1	1.7	-	0.9	-	1.4
Iprodione	0.5	-	-	0.7	-	0.4	-	-
Mancozeb	1.2	1.2	0.8	1.0	-	1.7	-	-
Mancozeb / Benalaxyl	1.2	1.1	0.7	0.9	-	1.5	1.9	0.8
Mancozeb / Cymoxanil	0.5	0.5	0.6	0.3	-	0.5	-	0.3
Mancozeb / Metalaxyl	0.5	-	0.4	-	-	0.6	-	-
Mancozeb / Metalaxyl-M	0.7	0.7	0.8	0.6	-	0.8	-	0.6
Mancozeb / Sulphur	0.5	-	0.2	-	-	0.5	-	-
Mancozeb / Zoxamide	0.3	0.3	0.3	1.6	-	0.6	-	-
Myclobutanil	0.1	-	0.1	0.2	-	0.1	-	-
Micronized Sulfur	1.1	-	-	-	-	1.1	-	-
Oxadixyl	4.2	-	0.2	0.3	-	5.0	-	-
Penconazole	0.0	0.0	0.0	0.0	-	0.0	-	0.0
Procymidone	0.6	-	-	0.4	-	0.6	-	-
Propamocarb	0.4	0.1	1.1	0.7	-	0.1	-	-
Propineb	0.7	1.6	0.7	-	-	-	-	-
Sulphur	53.4	1.0	113.3	34.8	2.4	8.9	0.9	-
Thiophanate-methyl	0.2	0.3	0.3	-	-	0.2	0.2	0.1
Thiram	0.7	1.1	-	-	-	0.6	-	-
Triadimenol	0.1	-	0.0	0.0	-	0.1	-	-
Trifloxystrobin	0.0	-	-	-	-	0.0	-	-
Triforine	0.1	-	0.1	-	-	-	-	-
Zineb	0.7	0.9	1.0	-	-	0.6	-	1.0
Zineb / Sulphur	0.1	-	0.1	-	-	-	-	-
Ziram	1.9	-	3.2	-	-	0.5	-	1.9

Table 20. Average quantity applied per formulation area treated (kg/ha) by formulation by crop

	Total	Potatoes	Fresh vegetables in the open	Fresh vegetables under glass	Forage	Vines	Citrus fruit	Stone fruit
Herbicides	1.2	1.1	0.9	-	1.2	2.2	-	0.9
Bentazon	0.4	-	-	-	0.4	-	-	-
Diquat	0.3	0.3	-	-	-	-	-	-
Glufosinate ammonium	0.2	0.2	-	-	-	-	-	-
Glyphosate	0.5	0.5	0.5	-	0.4	1.4	-	0.9
Linuron	1.5	1.5	1.0	-	-	-	-	-
MCPA	1.2	0.4	-	-	1.2	2.3	-	-
Metribuzin	0.2	1.1	0.1	-	-	-	-	-
Oxyfluorfen	0.6	-	0.6	-	-	-	-	-
Pendimethalin	5.4	0.5	5.6	-	-	-	-	-
Propachlor	0.4	-	0.4	-	-	-	-	-
Trifluralin	0.8	-	0.8	-	-	-	-	-
Insecticides	0.3	0.3	0.2	0.2	0.0	0.4	0.4	0.3
Acetamiprid	0.0	-	0.0	0.0	0.0	-	-	0.0
Bacillus Thuringiensis	0.2	-	-	0.2	-	-	-	-
Bifenthrin	0.0	0.0	0.0	-	-	-	-	0.4
Buprofezin	0.1	-	0.1	0.1	-	-	-	-
Carbaryl	0.6	1.0	0.2	-	-	0.7	0.4	0.5
Chlorpyrifos	0.5	0.2	0.4	0.3	-	0.3	0.9	0.7
Chlorpyrifos-methyl	0.1	-	0.1	0.1	-	0.4	-	0.2
Chlorpyrifos-Methyl / Cypermethrin	0.1	-	0.1	-	-	-	-	0.1
Cypermethrin	0.1	0.0	0.1	-	-	0.1	-	0.1
Cyromazine	0.2	-	0.1	0.4	-	-	-	-
Deltamethrin	0.0	-	0.0	0.0	-	0.0	0.0	0.0
Diafenthiuron	0.1	-	-	0.1	-	-	-	-
Dimethoate	0.4	0.1	0.3	-	-	0.0	0.4	0.4
Etofenprox	0.1	-	0.2	-	-	0.1	-	0.2
Imidacloprid	0.1	-	0.1	0.1	-	0.0	0.0	-
Lufenuron	0.0	0.0	0.0	0.0	-	0.0	-	0.0
Malathion	0.5	0.4	0.5	-	-	1.0	0.6	0.5
Permethrin	0.0	0.1	0.0	1.1	-	-	-	0.0
Phenthoate	0.1	-	0.0	-	-	0.1	0.1	0.1
Piperonyl Butoxide / Pyrethrins	0.1	-	-	-	-	-	-	0.1

Table 20. Average quantity applied per formulation area treated (kg/ha) by formulation by crop

	Total	Potatoes	Fresh vegetables in the open	Fresh vegetables under glass	Forage	Vines	Citrus fruit	Stone fruit
Insecticides cont								
Profenofos	0.2	-	0.2	-	-	-	-	-
Pymetrozine	0.2	-	0.2	0.2	-	-	-	-
Spinosad	0.2	-	0.1	0.2	-	-	-	-
Thiacloprid	0.0	-	0.0	0.1	-	-	-	-
Thiamethoxam	2.6	-	0.1	5.3	-	-	-	-
Trichlorfon	1.0	-	0.7	-	-	11.7	-	-
Soil sterilants	1.0	-	-	-	-	1.0	-	-
Metam-Sodium	1.0	-	-	-	-	1.0	-	-

Table 21. Average quantity applied per total cultivated area (kg/ha) by formulation by crop

	Total	Potatoes	Fresh vegetables in the open	Fresh vegetables under glass	Forage	Vines	Citrus fruit	Stone fruit
Acaricides	0.0	-	0.0	0.0	-	0.0	0.0	0.0
Abamectin	0.0	-	0.0	0.0	-	-	0.0	0.0
Acrinathrin	0.0	-	0.0	0.0	-	-	-	-
Dicofol	0.0	-	0.0	-	-	0.0	-	-
Fenazaquin	0.0	-	0.0	-	-	-	-	-
Hexythiazox	0.0	-	0.0	0.0	-	-	-	-
Propargite	0.0	-	0.0	-	-	-	-	0.0
Tebufenpyrad	0.0	-	0.0	-	-	-	-	-
Additives	0.0	-	-	-	-	0.0	-	0.1
Mineral Oil	0.0	-	-	-	-	0.0	-	0.1
Fungicides	14.4	3.9	102.8	27.8	0.0	16.1	0.1	0.9
Azoxystrobin	0.0	0.0	0.0	0.0	-	0.0	-	-
Bromuconazole	0.0	-	0.0	-	-	-	-	-
Bupirimate	0.0	-	0.0	0.0	-	-	-	-
Captan	0.0	-	-	0.0	-	-	-	-
Carbendazim	0.0	-	0.0	0.0	-	0.1	-	0.0
Chlorothalonil	0.0	0.1	0.0	0.1	-	0.0	-	-
Chlorothalonil / Propamocarb	0.0	0.3	0.0	0.7	-	0.0	-	-
Copper	0.0	0.0	-	-	-	-	-	0.0
Copper / Cymoxanil	0.0	-	0.0	-	-	-	-	-
Copper Hydroxide	0.0	-	-	-	-	0.0	-	-
Copper Oxychloride	0.0	0.0	0.1	-	-	0.0	-	0.0
Copper Oxychloride / Copper Sulfate	0.0	0.0	0.0	-	-	0.2	-	0.0
Copper Sulfate	0.0	0.0	0.0	-	-	0.0	-	-
Cymoxanil	0.0	0.1	0.0	0.0	-	0.0	-	-
Cymoxanil / Famoxadone	0.0	0.0	0.0	0.0	-	0.0	-	-
Cyprodinil / Fludioxonil	0.0	-	0.0	0.5	-	0.0	-	-
Diclofluanid	0.0	0.0	0.0	0.0	-	0.1	-	-
Difenoconazole	0.0	-	0.0	0.0	-	-	-	-
Dithianon	0.0	0.0	0.0	-	-	-	-	-
Dodine	0.0	0.0	-	-	-	-	-	-

Table 21. Average quantity applied per total cultivated area (kg/ha) by formulation by crop

	Total	Potatoes	Fresh vegetables in the open	Fresh vegetables under glass	Forage	Vines	Citrus fruit	Stone fruit
Fungicides cont								
Folpet	0.0	-	-	0.0	-	-	-	-
Fosetyl-Aluminium / Folpet	0.1	0.3	0.0	0.1	-	0.2	-	0.0
Iprodione	0.0	-	-	0.0	-	0.0	-	-
Mancozeb	0.2	0.8	0.4	2.3	-	0.8	-	-
Mancozeb / Benalaxyl	0.1	0.4	0.1	0.3	-	0.4	0.0	0.0
Mancozeb / Cymoxanil	0.0	0.1	0.1	0.0	-	0.3	-	0.0
Mancozeb / Metalaxyl	0.0	-	0.0	-	-	0.3	-	-
Mancozeb / Metalaxyl-M	0.3	1.4	0.4	1.5	-	0.7	-	0.0
Mancozeb / Sulphur	0.0	-	0.0	-	-	0.1	-	-
Mancozeb / Zoxamide	0.0	0.2	0.0	0.2	-	0.1	-	-
Myclobutanil	0.0	-	0.0	0.0	-	0.0	-	-
Micronized Sulfur	0.0	-	-	-	-	0.1	-	-
Oxadixyl	0.0	-	0.0	0.0	-	0.0	-	-
Penconazole	0.0	0.0	0.0	0.0	-	0.0	-	0.0
Procymidone	0.0	-	-	0.2	-	0.2	-	-
Propamocarb	0.0	0.0	0.0	0.0	-	0.0	-	-
Propineb	0.0	0.0	0.1	-	-	-	-	-
Sulphur	13.3	0.0	101.4	21.6	0.0	12.1	0.0	-
Thiophanate-methyl	0.0	0.0	0.1	-	-	0.0	0.0	0.0
Thiram	0.0	0.0	-	-	-	0.0	-	-
Triadimenol	0.0	-	0.0	0.0	-	0.0	-	-
Trifloxystrobin	0.0	-	-	-	-	0.0	-	-
Triforine	0.0	-	0.0	-	-	-	-	-
Zineb	0.0	0.1	0.1	-	-	0.2	-	0.0
Zineb / Sulphur	0.0	-	0.0	-	-	-	-	-
Ziram	0.0	-	0.0	-	-	0.0	-	0.8

Table 21. Average quantity applied per total cultivated area (kg/ha) by formulation by crop

	Total	Potatoes	Fresh vegetables in the open	Fresh vegetables under glass	Forage	Vines	Citrus fruit	Stone fruit
Herbicides	0.4	0.2	0.0	-	0.5	0.1	-	0.0
Bentazon	0.0	-	-	-	0.0	-	-	-
Diquat	0.0	0.0	-	-	-	-	-	-
Glufosinate ammonium	0.0	0.0	-	-	-	-	-	-
Glyphosate	0.0	0.0	0.0	-	0.0	0.0	-	0.0
Linuron	0.0	0.2	0.0	-	-	-	-	-
MCPA	0.3	0.0	-	-	0.5	0.1	-	-
Metribuzin	0.0	0.0	0.0	-	-	-	-	-
Oxyfluorfen	0.0	-	0.0	-	-	-	-	-
Pendimethalin	0.0	0.0	0.0	-	-	-	-	-
Propachlor	0.0	-	0.0	-	-	-	-	-
Trifluralin	0.0	-	0.0	-	-	-	-	-
Insecticides	0.1	0.1	0.2	0.4	0.0	0.4	0.8	1.1
Acetamiprid	0.0	-	0.0	0.0	0.0	-	-	0.0
Bacillus Thuringiensis	0.0	-	-	0.0	-	-	-	-
Bifenthrin	0.0	0.0	0.0	-	-	-	-	0.0
Buprofezin	0.0	-	0.0	0.0	-	-	-	-
Carbaryl	0.0	0.0	0.0	-	-	0.3	0.0	0.0
Chlorpyrifos	0.0	0.0	0.0	0.0	-	0.1	0.5	0.2
Chlorpyrifos-methyl	0.0	-	0.0	0.0	-	0.0	-	0.0
Chlorpyrifos-Methyl / Cypermethrin	0.0	-	0.0	-	-	-	-	0.0
Cypermethrin	0.0	0.0	0.0	-	-	0.0	-	0.0
Cyromazine	0.0	-	0.0	0.0	-	-	-	-
Deltamethrin	0.0	-	0.0	0.0	-	0.0	0.0	0.0
Diafenthiuron	0.0	-	-	0.0	-	-	-	-
Dimethoate	0.0	0.0	0.0	-	-	0.0	0.2	0.6
Etofenprox	0.0	-	0.0	-	-	0.0	-	0.0
Imidacloprid	0.0	-	0.0	0.0	-	0.0	0.0	-
Lufenuron	0.0	0.0	0.0	0.0	-	0.0	-	0.0
Malathion	0.0	0.1	0.1	-	-	0.0	0.0	0.2
Permethrin	0.0	0.0	0.0	0.0	-	-	-	0.0
Phenthoate	0.0	-	0.0	-	-	0.0	0.0	0.0
Piperonyl Butoxide / Pyrethrins	0.0	-	-	-	-	-	-	0.0

Table 21. Average quantity applied per total cultivated area (kg/ha) by formulation by crop

	Total	Potatoes	Fresh vegetables in the open	Fresh vegetables under glass	Forage	Vines	Citrus fruit	Stone fruit
Insecticides cont								
Profenofos	0.0	-	0.0	-	-	-	-	-
Pymetrozine	0.0	-	0.0	0.0	-	-	-	-
Spinosad	0.0	-	0.0	0.0	-	-	-	-
Thiacloprid	0.0	-	0.0	0.0	-	-	-	-
Thiamethoxam	0.0	-	0.0	0.2	-	-	-	-
Trichlorfon	0.0	-	0.0	-	-	0.0	-	-
Soil sterilants	0.0	-	-	-	-	0.1	-	-
Metam-Sodium	0.0	-	-	-	-	0.1	-	-

Table 22. Active substance area (ha) treated by active substance....

Rank	Active substance	Chemical family	Area of active substance applied (ha)	%	Cumulative %
1	Mancozeb	Fungicide	7,441.5	25.6%	25.6%
2	Metalaxyl-M	Fungicide	3,076.4	10.6%	36.2%
3	MCPA	Herbicide	2,306.1	7.9%	44.2%
4	Sulphur	Fungicide	2,151.0	7.4%	51.6%
5	Cymoxanil	Fungicide	1,398.2	4.8%	56.4%
6	Penconazole	Fungicide	1,041.1	3.6%	60.0%
7	Benalaxyl	Fungicide	739.5	2.5%	62.5%
8	Zoxamide	Fungicide	715.5	2.5%	65.0%
9	Chlorothalonil	Fungicide	620.8	2.1%	67.1%
10	Copper Oxychloride	Fungicide	617.1	2.1%	69.2%
11	Copper Sulfate	Fungicide	571.6	2.0%	71.2%
12	Zineb	Fungicide	554.4	1.9%	73.1%
13	Folpet	Fungicide	532.5	1.8%	74.9%
14	Fosetyl-Aluminium	Fungicide	532.2	1.8%	76.8%
15	Metalaxyl	Fungicide	474.0	1.6%	78.4%
16	Dimethoate	Insecticide	473.7	1.6%	80.0%
17	Propamocarb	Fungicide	464.8	1.6%	81.6%
18	Malathion	Insecticide	448.4	1.5%	83.2%
19	Chlorpyrifos	Insecticide	401.5	1.4%	84.6%
20	Carbaryl	Insecticide	360.9	1.2%	85.8%
21	Deltamethrin	Insecticide	347.8	1.2%	87.0%
22	Myclobutanil	Fungicide	344.4	1.2%	88.2%
23	Thiophanate-methyl	Fungicide	296.2	1.0%	89.2%
24	Cypermethrin	Insecticide	252.6	0.9%	90.1%
25	Lufenuron	Insecticide	252.2	0.9%	90.9%
26	Procymidone	Fungicide	247.3	0.9%	91.8%
27	Carbendazim	Fungicide	187.5	0.6%	92.4%
28	Cyprodinil	Fungicide	140.7	0.5%	92.9%
29	Fludioxonil	Fungicide	140.7	0.5%	93.4%
30	Triadimenol	Fungicide	134.4	0.5%	93.9%
31	Famoxadone	Fungicide	123.7	0.4%	94.3%
32	Ziram	Fungicide	120.7	0.4%	94.7%
33	Linuron	Herbicide	117.3	0.4%	95.1%
34	Imidacloprid	Insecticide	115.7	0.4%	95.5%
35	Tebuufenpyrad	Acaricide	115.1	0.4%	95.9%
36	Diclofluanid	Fungicide	114.5	0.4%	96.3%
37	Propineb	Fungicide	84.2	0.3%	96.6%
38	Acetamiprid	Insecticide	74.3	0.3%	96.9%
39	Micronized Sulfur	Fungicide	70.3	0.2%	97.1%
40	Abamectin	Acaricide	68.6	0.2%	97.3%
41	Metam-Sodium	Soil sterilant	68.0	0.2%	97.6%
42	Copper	Fungicide	66.7	0.2%	97.8%
43	Phenthoate	Insecticide	56.5	0.2%	98.0%
44	Difenoconazole	Fungicide	48.2	0.2%	98.2%
45	Chlorpyrifos-methyl	Insecticide	45.5	0.2%	98.3%
46	Glyphosate	Herbicide	43.2	0.1%	98.5%
47	Trichlorfon	Insecticide	37.0	0.1%	98.6%
48	Hexythiazox	Acaricide	36.7	0.1%	98.7%
49	Diquat	Herbicide	33.0	0.1%	98.8%
50	Bifenthrin	Insecticide	31.2	0.1%	98.9%
51	Propargite	Acaricide	30.9	0.1%	99.0%

Table 22. Active substance area (ha) treated by active substance

Rank	Active substance	Chemical family	Area of active substance applied (ha)	%	Cumulative %
52	Permethrin	Insecticide	29.4	0.1%	99.1%
53	Azoxystrobin	Fungicide	28.4	0.1%	99.2%
54	Mineral Oil	Additive	25.5	0.1%	99.3%
55	Thiacloprid	Insecticide	20.9	0.1%	99.4%
56	Etofenprox	Insecticide	19.1	0.1%	99.5%
57	Pymetrozine	Insecticide	17.8	0.1%	99.5%
58	Dicofol	Acaricide	17.0	0.1%	99.6%
59	Bentazon	Herbicide	11.5	0.0%	99.6%
60	Trifluralin	Herbicide	10.6	0.0%	99.7%
61	Bupirimate	Fungicide	9.0	0.0%	99.7%
62	Bromuconazole	Fungicide	7.1	0.0%	99.7%
63	Oxadixyl	Fungicide	6.3	0.0%	99.7%
64	Iprodione	Fungicide	5.7	0.0%	99.8%
65	Trifloxystrobin	Fungicide	5.6	0.0%	99.8%
66	Copper Hydroxide	Fungicide	5.5	0.0%	99.8%
67	Metribuzin	Herbicide	4.5	0.0%	99.8%
68	Thiamethoxam	Insecticide	4.5	0.0%	99.8%
69	Spinosad	Insecticide	4.5	0.0%	99.8%
70	Thiram	Fungicide	4.4	0.0%	99.9%
71	Glufosinate ammonium	Herbicide	4.4	0.0%	99.9%
72	Oxyfluorfen	Herbicide	4.3	0.0%	99.9%
73	Cyromazine	Insecticide	3.9	0.0%	99.9%
74	Profenofos	Insecticide	3.9	0.0%	99.9%
75	Triforine	Fungicide	3.3	0.0%	99.9%
76	Dithianon	Fungicide	3.2	0.0%	99.9%
77	Propachlor	Herbicide	3.2	0.0%	99.9%
78	Piperonyl Butoxide	Insecticide	3.2	0.0%	100.0%
79	Pyrethrins	Insecticide	3.2	0.0%	100.0%
80	Fenazaquin	Acaricide	2.7	0.0%	100.0%
81	Bacillus Thuringiensis	Insecticide	1.7	0.0%	100.0%
82	Pendimethalin	Herbicide	1.5	0.0%	100.0%
83	Dodine	Fungicide	1.0	0.0%	100.0%
84	Buprofezin	Insecticide	0.9	0.0%	100.0%
85	Acrinathrin	Acaricide	0.5	0.0%	100.0%
86	Diafenthiuron	Insecticide	0.2	0.0%	100.0%
87	Captan	Fungicide	0.2	0.0%	100.0%

Table 23. Weight (kg) of active substance applied on all crops

Rank	Active substance	Chemical family	Weight of active substance applied (kg)	%	Cumulative %
1	Sulphur	Fungicide	108,006.3	89.5%	89.5%
2	Mancozeb	Fungicide	5,602.1	4.6%	94.1%
3	MCPA	Herbicide	2,724.5	2.3%	96.4%
4	Zineb	Fungicide	397.5	0.3%	96.7%
5	Fosetyl-Aluminium	Fungicide	324.2	0.3%	97.0%
6	Chlorothalonil	Fungicide	287.8	0.2%	97.2%
7	Copper Oxychloride	Fungicide	283.9	0.2%	97.4%
8	Ziram	Fungicide	230.3	0.2%	97.6%
9	Carbaryl	Insecticide	228.6	0.2%	97.8%
10	Malathion	Insecticide	211.6	0.2%	98.0%
11	Chlorpyrifos	Insecticide	185.8	0.2%	98.1%
12	Propamocarb	Fungicide	177.0	0.1%	98.3%
13	Dimethoate	Insecticide	176.4	0.1%	98.4%
14	Linuron	Herbicide	174.1	0.1%	98.6%
15	Cymoxanil	Fungicide	167.6	0.1%	98.7%
16	Folpet	Fungicide	162.3	0.1%	98.8%
17	Procymidone	Fungicide	140.3	0.1%	99.0%
18	Metalaxyl-M	Fungicide	134.8	0.1%	99.1%
19	Diclofluanide	Fungicide	126.1	0.1%	99.2%
20	Benalaxyl	Fungicide	93.4	0.1%	99.3%
21	Copper Sulfate	Fungicide	79.4	0.1%	99.3%
22	Micronized Sulfur	Fungicide	75.8	0.1%	99.4%
23	Thiophanate-methyl	Fungicide	72.3	0.1%	99.4%
24	Metam-Sodium	Soil Sterilant	71.2	0.1%	99.5%
25	Propineb	Fungicide	57.7	0.0%	99.6%
26	Mineral Oil	Mineral Oil	49.4	0.0%	99.6%
27	Carbendazim	Fungicide	49.2	0.0%	99.6%
28	Trichlorfon	Insecticide	36.6	0.0%	99.7%
29	Myclobutanil	Fungicide	34.9	0.0%	99.7%
30	Penconazole	Fungicide	33.8	0.0%	99.7%
31	Metalaxyl	Fungicide	28.9	0.0%	99.7%
32	Zoxamide	Fungicide	27.6	0.0%	99.8%
33	Oxadixyl	Fungicide	26.7	0.0%	99.8%
34	Cypermethrin	Insecticide	25.7	0.0%	99.8%
35	Cyprodinil	Fungicide	23.0	0.0%	99.8%
36	Glyphosate	Herbicide	22.6	0.0%	99.9%
37	Copper	Fungicide	18.3	0.0%	99.9%
38	Fludioxonil	Fungicide	15.3	0.0%	99.9%
39	Triadimenol	Fungicide	12.4	0.0%	99.9%
40	Thiamethoxam	Insecticide	11.6	0.0%	99.9%
41	Diquat	Herbicide	9.4	0.0%	99.9%
42	Trifluralin	Herbicide	8.4	0.0%	99.9%
43	Pendimethalin	Herbicide	8.3	0.0%	99.9%
44	Imidacloprid	Insecticide	7.1	0.0%	99.9%
45	Famoxadone	Fungicide	6.8	0.0%	99.9%
46	Chlorpyrifos-methyl	Insecticide	6.4	0.0%	99.9%
47	Lufenuron	Insecticide	6.3	0.0%	99.9%
48	Azoxystrobin	Fungicide	6.2	0.0%	99.9%
49	Propargite	Acaracide	5.0	0.0%	100.0%
50	Phenthoate	Insecticide	5.0	0.0%	100.0%
51	Bentazon	Herbicide	4.8	0.0%	100.0%

Table 23. Weight (kg) of active substance applied on all crops

Rank	Active substance	Chemical family	Weight of active substance applied (kg)	%	Cumulative %
52	Difenoconazole	Fungicide	4.6	0.0%	100.0%
53	Pymetrozine	Insecticide	3.7	0.0%	100.0%
54	Thiram	Fungicide	3.2	0.0%	100.0%
55	Deltamethrin	Insecticide	3.1	0.0%	100.0%
56	Dicofol	Acaracide	2.9	0.0%	100.0%
57	Iprodione	Fungicide	2.9	0.0%	100.0%
58	Dithianon	Fungicide	2.7	0.0%	100.0%
59	Etofenprox	Insecticide	2.6	0.0%	100.0%
60	Copper Hydroxide	Fungicide	2.6	0.0%	100.0%
61	Oxyfluorfen	Herbicide	2.4	0.0%	100.0%
62	Bupirimate	Fungicide	2.3	0.0%	100.0%
63	Acetamiprid	Insecticide	2.0	0.0%	100.0%
64	Tebuconazole	Acaracide	1.9	0.0%	100.0%
65	Hexythiazox	Acaracide	1.4	0.0%	100.0%
66	Propachlor	Herbicide	1.3	0.0%	100.0%
67	Permethrin	Insecticide	1.2	0.0%	100.0%
68	Metribuzin	Herbicide	1.1	0.0%	100.0%
69	Thiacloprid	Insecticide	1.0	0.0%	100.0%
70	Spinosad	Insecticide	0.9	0.0%	100.0%
71	Profenofos	Insecticide	0.7	0.0%	100.0%
72	Bifenthrin	Insecticide	0.7	0.0%	100.0%
73	Glufosinate ammonium	Herbicide	0.7	0.0%	100.0%
74	Cyromazine	Insecticide	0.6	0.0%	100.0%
75	Abamectin	Acaracide	0.5	0.0%	100.0%
76	Triforine	Fungicide	0.4	0.0%	100.0%
77	Fenazaquin	Acaracide	0.3	0.0%	100.0%
78	Dodine	Fungicide	0.3	0.0%	100.0%
79	Bacillus Thuringiensis	Insecticide	0.3	0.0%	100.0%
80	Piperonyl Butoxide	Insecticide	0.2	0.0%	100.0%
81	Trifloxystrobin	Fungicide	0.1	0.0%	100.0%
82	Buprofezin	Insecticide	0.1	0.0%	100.0%
83	Captan	Fungicide	0.1	0.0%	100.0%
84	Pyrethrins	Insecticide	0.1	0.0%	100.0%
85	Bromuconazole	Fungicide	0.0	0.0%	100.0%
86	Acrinathrin	Acaracide	0.0	0.0%	100.0%
87	Diafenthiuron	Insecticide	0.0	0.0%	100.0%

Glossary of terms

Acaricide

A specific type of insecticide specifically designed to control mite pests on crops

Active substance

Any substance or micro-organism, including a virus, having general or specific action against harmful organisms or on plants, parts of plants or plant products

Active substance area treated

The area of crop treated with individual active substances within formulations (products). Thus, one hectare of crop treated with four products (consecutively or tank-mixed together), each of which comprised 2 active substances, would give 8 active substance treated hectares. (see: also basic area treated and formulation area treated)

Basic area treated

The physical area receiving a particular pesticide, independent of the number of applications.

Biological product

A micro-organism, including parasites or diseases that are used to control pests weeds and diseases. Any micro-organism, including viruses, must be approved before it can be used as a plant protection product. Larger organisms, such as insect predators or nematodes do not have to be approved as plant protection products. However, non-native species may be subject to other legislation.

Cultivated area

The whole "observed" (surveyed area), whether treated or not

Disease

A condition causing damage to a plant, in this report referring to that caused as a result of a fungal attack

Dry powder

A formulation of plant protection product where the product is applied to the crop as a dust or powder

Formulation

The combination of active substances used in a specific plant protection product. The formulation may comprise a single active substance or be mixtures of two or more active substances

Formulation area treated

The area of crop treated with individual formulations of plant protection products (products). Thus, one hectare of crop treated with four products (consecutively or tank-mixed together) would give 4 formulation treated hectares. (see also basic area treated area and active substance area treated)

Fungicide

A plant protection product used to control unwanted fungal diseases in plants.

Granule

A formulation of a plant protection product where the product is applied directly to the soil (commonly) or crop (rarely) in the form of small granules either **broadcast** (over the soil or crop) or **incorporated** into the soil by mechanical means after spreading

Ground sprayer

Any tractor-mounted hydraulic spraying equipment used for applying plant protection products to crops

Herbicide

A plant protection product used to control unwanted vegetation (weed killer) often specifically designed to selectively kill weeds in amongst crop plants, whilst leaving the crop unaffected

Insecticide

A plant protection product used to control unwanted insects

Intensity of treatment

An indication of the number of times a crop has been treated with plant protection products

Irrigated land (Raba' saqwi)

The land which has a continuous supply of water all the year round, whether it has a natural spring, served by second class water, or supplied by other sources

Knapsack

Hydraulic plant protection product application machinery carried on the back and used to apply plant protection product sprays through a hand-held lance

Molluscicide

A plant protection product used to control unwanted slugs and snails

Nematicide

A plant protection product applied directly to the soil specifically to control plant-infecting nematodes

Pest

Any organism harmful to plants or to wood or other plant products, any undesired plant and any harmful creature

Plant protection product

An active substance or a preparation containing one or more active substances, put up in the form in which it is supplied to the user, intended to;

- protect plants or plant products against all harmful organisms or prevent the action of such organisms;
 - influence the life processes of plants, other than as a nutrient (for example, as a growth regulator);
 - preserve plant products, in so far as such substances or products are not subject to Community law on preservatives;
 - destroy undesired plants; or
 - destroy parts of plants or check or prevent the undesired growth of plants.
- Formulated plant protection products exist in many forms, such as solid granules, powders or liquids.

Repellent

A plant protection product used to protect plants by deterring pests (often birds) through its unpleasant smell or taste

Soil fumigation

A method of sterilising soil by injecting a plant protection product, usually a soil sterilant, directly into the ground

Soil sterilant

A broad-spectrum plant protection product applied directly to the soil to kill weeds and weed seeds, pests and diseases in the soil prior to planting, usually, high value crops such as strawberries

Utilised agricultural area (UAA)

Utilised agricultural area (UAA) is the summation of all arable land, which can normally be used under a system of crop rotation, and permanent crops.

Weed

Any plant growing in a location where it is not wanted.

ANNEXE

KUNFIDENZJALI WARA LI JIMTELA CONFIDENTIAL AFTER FILLED IN

Ibdeġ fejn japplika Change where applicable	NSO Reference		
	Isem u Kunjom Name & Surname		
	Dar Nru / Isem House No / Name		
	Triq Street		
	Lokalita Locality		

Interviewer ID	
Date	
Signature	

**Stharriġ dwar l-użu tal-Bexx
1 ta' Settembru 2006 – 31 ta' Awissu 2007**

Kwestjonarju - Użu tar-raba'

***Survey on the use of Plant Protection Products
1st September 2006 – 31st August 2007***

Questionnaire – Land use

It-tagħrif qiegħed jintalab bis-setgħa ta' l-Att XXIV ta' l-2000 li waqqaf l-Awtorita ta' l-Istatistika ta' Malta.
Din l-informazzjoni tintuża biss għal skop ta' ġbir ta' statistika u analiżi.
Hemm kontemplati penaltajiet amministrattivi f'każ ta' nuqqas ta' koperazzjoni u dikjarazzjonijiet foloz

Supply of data is compulsory under the Malta Statistics Authority Act XXIV 2000.
Data will be used for statistical purposes only.
Refusal or false declarations may incur penalties.

**Persuna ta' Riferenza
Reference Person**

Firma
Signature

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Nru Karta ta' l-Identità
Id Card No

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Nru Tel
Tel No.

--	--	--	--	--	--	--	--

Nru Mobile
Mobile No.

**Agriculture and Fisheries Unit
Lascaris, Valletta CMR 02, Malta
Tel: +356 25 997 529 Fax: +356 25 997 522
agric.nso@gov.mt, <http://www.nso.gov.mt>**

Row Number	Parcel Number	Area under parcel (ha)	Pre-planting treatment	Cycle Number	Crop Code	Area under crop (ha)	Irrigated	Treated	Sown Date mm/yy	Harvest Date mm/yy
			Yes=1 No=2				Yes=1 No=2	Yes=1 No=2		

1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										

Crop Code

- 99 Pre-Planting treatment

11 Set-aside

12 Forage

13 Potatoes

14 Onions

15 Carrots

16 Tomatoes

17 Vegetable Marrows
- 18 Sugar Melons

19 Water Melons

20 Other Vegetables

21 Vines

22 Citrus Fruit

23 Peaches

24 Other Stone Fruit

25 Other permanent crops
- 26 Plants & Flowers

27 Tomatoes - GH

28 Vegetable Marrows - GH

29 Sugar Melons - GH

30 Water Melons - GH

31 Other vegetables - GH

KUNFIDENZJALI WARA LI JIMTELA CONFIDENTIAL AFTER FILLED IN

Ibdel fejn japplika Change where applicable	NSO Reference		
	Isem u Kunjom Name & Surname		
	Dar Nru / Isem House No / Name		
	Triq Street		
	Lokalita Locality		

Interviewer ID	
Date	
Signature	

**Stharriġ dwar l-użu tal-Bexx
1 ta' Settembru 2006 – 31 ta' Awissu 2007**

Kwestjonarju – Raba' Mbexxa

***Survey on the use of Plant Protection Products
1st September 2006 – 31st August 2007***

Questionnaire – Treated Areas

It-tagħrif qiegħed jintalab bis-setgħa ta' l-Att XXIV ta' l-2000 li waqqaf l-Awtorita ta' l-Istatistika ta' Malta.
Din l-informazzjoni tintuża biss għal skop ta' ġbir ta' statistika u analiżi.
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**Persuna ta' Riferenza
Reference Person**

Firma
Signature

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Nru Karta ta' l-Identità
Id Card No

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Nru Tel
Tel No.

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Nru Mobile
Mobile No.

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