



EUROPEAN COMMISSION
HEALTH & CONSUMER PROTECTION DIRECTORATE-GENERAL
Directorate F - Food and Veterinary Office

DG(SANCO)/8002/2006 – MR Final

FINAL REPORT OF A MISSION
CARRIED OUT IN THAILAND
FROM 18 TO 27 JANUARY 2006

IN ORDER TO EVALUATE CONTROL SYSTEMS FOR PESTICIDE RESIDUES IN
FOODSTUFFS OF PLANT ORIGIN INTENDED FOR EXPORT TO THE
EUROPEAN UNION

*Please note that factual errors in the draft report have been corrected in the text.
Clarifications provided by the Thai Authorities are given as footnotes
in bold, italic type, to the relevant part of the report.*



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ABBREVIATIONS & SPECIAL TERMS USED IN THE REPORT

APSRDO	Agricultural Production Sciences Research & Development Office
CIPAC	Collaborative International Pesticides Analytical Council
CODEX	Codex Alimentarius Commission of the Food and Agriculture Organization of the United Nations and World Health Organization
DAD	Diode Array Detector
DOA	Department of Agriculture
ECD	Electron Capture Detector
EUROSTAT	Directorate-General for European Statistics of the European Commission
FAO	Food and Agriculture Organization of the United Nations
FAPAS	Food Analysis Performance Assessment Scheme
FID	Flame Ionisation Detector
GAP	Good Agricultural Practice
GC	Gas Chromatograph
GC-MS	Gas Chromatograph-Mass Spectrometer
GMP	Good Manufacturing Practice
HPLC	High Performance Liquid Chromatography
MOAC	Ministry of Agriculture and Cooperatives
MOPH	Ministry of Public Health
MRL	Maximum Residue Level
NPD	Nitrogen Phosphorous Detector
OAR	Office of Agricultural Regulation
OARD	Office of Agricultural Research & Development
TOSS	Technical One Stop Service
UV	Ultra Violet

EXECUTIVE SUMMARY

Exceedances of the Maximum Residue Levels (MRLs) for pesticide residues in foodstuffs of plant origin from Thailand have been reported by EU Member States to the European Commission. Also, 25 notifications of unacceptable levels of pesticide residues, within the EU Rapid Alert System for Food and Feed, have been noted. Therefore, a mission to evaluate the control system for pesticide residues in foodstuffs of plant origin intended for export to the European Union was proposed. The control system for marketing and use of plant protection products was also evaluated.

Control of Marketing and Use of Plant Protection Products

Legislation for the control of the marketing and use of plant protection products is in place. All plant protection products must be registered prior to marketing. Many generic products are registered. Controls on marketing take place during import or manufacture of plant protection products through licensing and sampling for analysis for content and identity of active substance. Herbicides constitute almost 70% of pesticide imports. Sales outlets must also be licensed and inspected. Efficient or effective follow-up on the previous inspections was lacking due to the absence of a written report on deficiencies or non-compliances found. Inspections of users of plant protection products are not routinely conducted and spraying frequency is very high.

The laboratory for formulation analysis is very well equipped and staffed and analyses a very large number of samples for content and identity of active substance. Many products on the domestic market were non-compliant for content of active substance.

Control system for pesticide residues in foodstuffs of plant origin

The basic legislation for control of pesticide residues is in place but MRLs have been established for less than 5% of the substances on the market in Thailand. The mandatory control of foodstuffs of plant origin intended for export is limited to only 12 commodities and to only 30 active substances, despite the fact that 53 substances are listed in the legal provisions. The sampling procedure was broadly in accordance with the CODEX sampling guidelines for residue sampling. The level of non-compliances with EU MRLs for pesticide residues is high, taking into account the small number of analytes being sought during analysis. Official follow-up of infringements notified through the EU Rapid Alert System for Food and Feed relating to pesticide residues did not take place.

Only some laboratories are accredited to ISO 17025 and a low number of analytes are routinely sought. Nevertheless, the laboratory network is very well equipped and staffed and has the potential to substantially increase the number of active substances and the number of commodities being controlled.

Additional voluntary control systems

As part of a Food Safety strategy, a voluntary system of quality control, through certification of plots and pack-houses which comply with set principles, is officially checked. However, it is limited in the numbers of commodities and pesticide substances being controlled. To date, just over 4% of crop farmers have certified plots. Some exporters have registered with International quality systems to provide additional assurance to their EU customers.

Overall, an official pesticide residue control system, for foodstuffs of plant origin intended for export, is in place. The system, as implemented, is limited to 12 economically important commodities and to monitoring of only a small number of pesticides. However, the limitations of the official control system provide little assurance that foodstuffs of plant origin being exported to the EU will comply with EU legislation. This raises concerns about compliance with Article 11 of Regulation (EC) No. 178/2002.

The report contains recommendations to the competent authority of Thailand to address identified shortcomings.

1. INTRODUCTION

The mission took place in Thailand from 18 to 27 January 2006. The mission team comprised of two inspectors from the Food and Veterinary Office (FVO) and one Member State expert.

The mission was undertaken as part of the FVO's planned mission programme and was the first mission to Thailand dealing with pesticide residues in produce of plant origin.

The inspection team was accompanied during the whole mission by a representative from the central competent authority, the Ministry of Agriculture and Cooperatives (MOAC).

An opening meeting was held on 18 January 2006 with the central competent authority, MOAC. At this meeting, the objectives of, and itinerary for, the mission were confirmed by the inspection team, and additional information required for the satisfactory completion of the mission was requested. The mission programme was finalised and the possibility for some flexibility in the programme was requested by the mission team and granted by the competent authority.

2. OBJECTIVES OF THE MISSION

The objective of the mission was to evaluate the control systems for pesticide residues in foodstuffs of plant origin intended for export into the European Union. The implementation and the effectiveness of any existing pesticide residue monitoring plan was evaluated.

The facilities and measures in place for the determination of such residues in foodstuffs of plant origin were also assessed to ensure that the produce is within specified limits set down in European Union legislation. As residue controls are related to the placing on the market and use of plant protection products, the control system for the latter functions was also evaluated. The mission formed part of a wider series of missions to Third Countries evaluating control systems and operational standards in this sector.

The mission was carried out in the framework of:

- Regulation (EC) No 178/2002¹;
- Regulation (EC) No. 882/2004;
- Regulation (EC) No. 852/2004;
- Council Directive 76/895/EEC;
- Council Directive 90/642/EEC;

¹ Legal Acts quoted in this report refer, where applicable, to the last amended version.

- Council Directive 86/362/EEC;
- Regulation (EC) No 396/2005.

In pursuit of these objectives, the following sites were visited:

COMPETENT AUTHORITIES VISITED	Comments
Department of Agriculture (DOA) of the Ministry of Agriculture and Cooperatives (MOAC).	Central competent authority for the control of marketing and use of plant protection products and for control of pesticide residues in foodstuffs of plant origin intended for export.
Agricultural Production Sciences Research & Development Office (APSRDO) of DOA.	Competent authority for coordination of control of pesticide residues in foodstuffs of plant origin and for control of marketing of plant protection products.
Technical One Stop Service Centre of DOA.	Management of records of controls conducted.
Office of Agricultural Regulation (OAR).	Competent authority for registration of plant protection products.
Regional and Provincial Offices of Agricultural Research & Development (OARD) No. 5, of the DOA in Chainat, Kanchanaburi and Nakorn Pathom Provinces.	Competent authority responsible for control of marketing and use of plant protection products and control of pesticide residues in foodstuffs of plant origin intended for export at regional and provincial levels.
Phytosanitary Office at point of export in Bangkok Airport.	Competent authority for Plant Health controls and control of exports of specific foodstuffs of plant origin to the EU and elsewhere.
Customs & Excise Office at point of export in Bangkok Airport.	Competent authority for control of exports.
LABORATORY VISITED	Comments
APSRDO Laboratory.	Conducts analyses for formulation and pesticide residue controls.
Private Laboratory for Pesticide Residues analysis.	Conducts analysis for pesticide residues in foodstuffs of plant origin intended for export.
OARD 5 Laboratory.	Conducts analysis for pesticide residues in foodstuffs of plant origin.
INSPECTION VISITS	Comments
Inspection visits to 3 growers and 2 pack-houses of foodstuffs of plant origin.	Producers and packers of foodstuffs of plant origin intended for export or for domestic market.
Inspection visit to retailer of plant protection products.	Retailer of large quantities of plant protection products, particularly herbicides, to growers.

3. LEGAL BASIS FOR THE MISSION

The mission was carried out under the general provisions of Community legislation, in particular, under Article 46 of Regulation No (EC) 882/2004, and in agreement with the Ministry of Agriculture and Cooperatives in Thailand.

4. BACKGROUND

4.1. Background to present mission

Exceedances of the Maximum Residue Levels for pesticides in foodstuffs of plant origin from Thailand have been reported by EU Member States to the European Commission. However, some of the exceedances reported are of a technical nature resulting from the EU MRL being established at the Limit of Detection, because the use is not authorised in the EU or because no data to support an MRL was provided.

In addition, produce of plant origin from Thailand has been notified, since 2001, on 25 occasions (20 fruit and vegetables, 5 herbs and spices) for commodities such as yard-long beans, Chinese broccoli, sweet and chilli peppers, basil, parsley and peas through the EU Rapid Alert System for Food and Feed (RASFF) for the presence of unacceptable levels of pesticide residues. Nine of these alerts occurred in 2005.

4.2. Production and trade information

According to EUROSTAT, 14,888 tonnes of fruit and 359,369 tonnes of vegetables from Thailand were imported into the EU in 2005. In 2004, 1,075 tonnes of beans and 361 tonnes of peppers were imported and are the crops most frequently exceeding EU MRLs and for which most notifications were issued within the EU Rapid Alert System for Food and Feed. Vegetables are mainly grown in the central part of the country. The mission team was informed by DOA that the total cultivation area in Thailand is around 10,221,350 ha and the number of agricultural holdings involved in growing crops is 3,280,370.

According to the data provided by the DOA, there were 53,050 tonnes of pesticide active substances imported in 2004, of which 35,615 tonnes (70%) were herbicides, 8,372 tonnes (15%) were insecticides and 6,429 tonnes (10%) were fungicides. The data also show that over 50% of imported pesticides originate from China. A total of 3,941 tonnes of active substance was exported, resulting in an estimated use of 49,109 tonnes. The data indicate a significant increase in imports of pesticide active substances when compared with the 1996 import figure of 25,542 tonnes.

5. MAIN FINDINGS

5.1. Control system for the placing on the market and use of plant protection products

5.1.1. Legislation

Legislation for registration and control of the marketing of pesticides, including plant protection products, and control of their use by 'pest control companies' and aerial sprayers has been introduced through the Hazardous Substances Act (1992). Other uses of pesticides are controlled through the registration process.

Notifications (legal instruments) for implementation of controls, including the requirement for licensing of persons involved in marketing of plant protection products, are in place.

5.1.2. Competent authority

The competent authority for registration of plant protection products is the DOA of the MOAC.

The competence for planning and implementing controls in the marketing and use of plant protection products is with the OAR of the DOA at central level and with the OARDs, 1-8 of the DOA at each of the 8 regions.

5.1.3. Authorisation of plant protection products

Plant protection products must be registered for placing on the market in Thailand. Data requirements for registration of a substance for the first time in Thailand from every manufacturer are broadly based on the FAO Guidelines for Registration and Control of Pesticides, 1985. The registration procedure requires information necessary for hazard classification associated with the active substance but does not include detailed assessments of the risks to human health, animals or to the environment. Once a substance or plant protection product has been registered, submission for analysis of a sample of technical material or of formulated product is sufficient to support registration of generic products. Since 1977, a total of 96 substances, previously on the market, have been banned on the basis of toxicity or where other unacceptable properties or unacceptable uses have been noted. Maximum Residue Levels are not established during the registration procedure but submission of residue data and pre harvest interval (PHI) is required. The registration certificate, specifying the registered uses of the product, is issued by the Director-General of the DOA, following agreement by a Sub-committee for Pesticide Registration, comprising of representatives from DOA (16 persons), Department of Livestock (1), Department of Fisheries (1) and the Universities (1).

Over 16,900 plant protection products, containing approximately 400 active substances, are registered for marketing and use. It was noted that more than 850 products containing the substance, methamidophos, were registered at the time of the banning of the substance in 2003.

5.1.4. Control activities regarding the placing on the market and the use of plant protection products

5.1.4.1. Planning, priorities and scope

There are no written plans at central or regional level for control of marketing and use². However, a manual for inspectors of plant protection products is available and

² *In their response to the draft report, the competent authority of Thailand noted that “Control plan for marketing of plant protection products, at the central and regional level, is functioning in accordance with Hazardous Substance Act B.E. 2535, Ministerial Regulation B.E. 2537, and the Department of Agriculture’s Procedure for License Approval in Other Provinces Except Bangkok B.E. 2539.*

Routine inspection of retail shops is part of the control plan taking place at least once a year at the time of license renewal as stated in section 27 of the Hazardous Substance Act B.E. 2535 “The application for renewal of a permit (license) and the renewal thereof shall be in accordance with the criteria and procedures provided for in the ministerial regulations”. Article 3 (2), Ministerial

controls of marketing are taking place because a license must be obtained by importers, exporters, producers and storage facilities of active substances or formulated plant protection products of specified hazard. Licenses are issued by the OAR and are based on inspection of the premises. Sampling of the active substance or of the plant protection products normally takes place during the inspections. There are 75 formulators of plant protection products in Thailand and samples are taken at these premises 3 times per year. Licenses, granted by the OAR for Bangkok, the OARD 1-8 or the Provincial Agricultural Offices, are also required for 'having in possession' for sale, for transport or for provision of pest control and aerial spraying services.

5.1.4.2. Performance of inspections

The mission team observed an inspection of a retailer of plant protection products. It was stated by the competent authority that, as a general rule, retailers of plant protection products are inspected once or twice each year by the OARD. Licenses granted to retailers are valid for one year and it was stated by the owner of the retail outlet that the license may be renewed on application and a new certificate was issued without inspection. Pesticide retailers must have supervisors, trained by the OAR, who may give advice to growers. In the retail shop visited, the supervisor relied on brochures from the chemical companies as a basis for advice given.

During the inspection, 2 inspectors worked as a team and checked that the license certificates are valid, no banned plant protection products are present and that the stocked plant protection products are registered. Compliance with the conditions contained in the license, for example, a limitation on the stock of plant protection products to a maximum of 1 tonne and limiting the shelf space to a maximum of 10 m², was not validated by the inspectors and no action was taken where substantially more stocks of plant protection products (more than 45 tonnes) were present with a resulting exceedance of the maximum permitted shelf space.

The inspectors had a list of registered plant protection products but the list had not been updated since 2004. The list included data on the plant protection product such as commercial name, identity of active substance, content of active substance, manufacturer, distributor, registration number and date of revoking registration. During the observed inspection, it was noted by the mission team that the inspectors could not verify that the plant protection products were packaged and labelled in accordance with the registration granted and had no information concerning the pesticides registered within the past 12 months. It was further noted by the mission team that, since 1998, between 2,500 and 4,850 products have been registered each year. A report form, which contained a number of 'tick' boxes relating to licenses, environmental safety, personal protective equipment, waste disposal equipment, storage and display, packaging and labelling of products and to standards and quality of the products was completed and signed by the inspectors and the owner.

Sampling of active substances and plant protection products to ensure quality is conducted at import, formulator or distributor level and was not observed during the

Regulation B.E. 2537, states, "Upon receiving application, authorized officer shall inspect the establishment and document, and then shall submit inspection report within 10 days. License shall be granted only when inspection report is presented. Application can be submitted and/or granted by mail."

mission. Samples taken as a market control are tested for content and identity of active substance only. APSRDO reported that over 5,500 samples were collected by APSRDO, OARD and TOSS staff for analysis in 2004. Up to November 2005, almost 4,000 samples had been taken. Between 75% and 80% of the samples were taken at the point of import. It is noted that non-compliance with FAO specifications for content of active substance was detected in almost 10% of the 1,313 samples taken from the domestic market in 2004 and almost 15% of the 657 samples taken in 2005. Less than 1% of the samples taken at the point of import were non-compliant for content of active substance.

5.1.4.3. Controls on Use

Registrations for marketing plant protection products contain recommendations for the proper use of the product. However, possible use of the products on additional crops, not included on the label, is not controlled at farm level, except where an application for Good Agricultural Practice certification is submitted under the Food Safety strategy (See Chapter 5.3). Otherwise no controls are planned or conducted on users of plant protection products.

5.1.4.4. Follow-up of infringements

Any deficiencies or non-compliances seen during an inspection were stated by the inspector to be reported verbally to the person in charge of the premises. The report form for the inspection did not provide for recording of any non-compliances seen during the inspection or for corrective action to be taken. Samples taken at point of import and found to be non-compliant for content of active substance resulted in the license to import being refused.

Since inspection of users are not being routinely conducted, no infringements are identified and no follow-up is possible.

5.1.5. *Formulation laboratory*

The formulation laboratory of the APSRDO, visited by the mission team, is the only laboratory engaged in quality control of plant protection product formulations. The laboratory has large facilities, a total staff of 12 persons, consisting of 5 scientists, 4 technicians and 3 assistants and provides regular training internally and externally. It is equipped with 5 GC with FID and ECD detectors, 2 GC-MS and 3 HPLC with UV and DAD detectors, UV spectrometers, 1 Atomic Absorption spectrometer, 1 Master-sizer and additional equipment for analysis of a range of physical/chemical properties.

The laboratory applies the CIPAC methods, where available and has already received its first inspection by the Thai accreditation body to achieve accreditation according to ISO 17025. The Department of Medical Sciences, through the Bureau of Laboratory Quality Standards is responsible for granting laboratory accreditation.

In addition to the samples analysed as part of market control, approximately 250 analyses per year are conducted for identity and content of active substance and for a range of physical/chemical tests as part of the registration process. This represents around 10% of the total number of annual registrations. Analyses for content and identity of impurities in the technical materials of the active substances are not routinely conducted.

5.2. Control system for pesticide residues in foodstuffs of plant origin

5.2.1. Legislation

The control of pesticide residues in products of plant origin for the domestic and export markets are based on Notifications (legal instruments), under the Food Act, 1979 and under the Export and Import of Goods Act, 1979, introduced by the Ministry of Public Health (MOPH) and Department of Foreign Trade of the Ministry of Commerce, respectively.

A Notification (No. 288 of 2005) by the MOPH introduced national MRLs for 11 substances registered for use on foodstuffs of plant origin and for 6 substances which are no longer registered. The national MRLs were set on the basis of field trials data generated by the MOAC (DOA). MRLs are not established for substances at the time of first registration. The Notification also states that CODEX MRLs, where relevant, may be adopted for other substances on the Thai market. In order to be legally enforceable in Thailand, MRLs must be published in the Government Gazette, but it is noted that CODEX MRLs have not been published in the Government Gazette and a consolidated list of MRLs is not readily available to stakeholders.

A Notification by the Department of Foreign Trade in 2003, implemented by the DOA, requires that all batches of 12 specific commodities, (longan, durian, lychee, mangosteen, sweet tamarind, mango, pummelo, asparagus, ginger, okra, baby corn and chilli, which are of economic importance to Thailand), must be tested for the presence of 53 pesticide analytes (including insecticides, fungicides and herbicides), and certified before being exported to specified markets, including the EU³.

5.2.2. Competent authorities

MOAC and the MOPH are the joint competent authorities for establishment of MRLs in foodstuffs of plant origin.

Control of residues of pesticides in foodstuffs of plant origin on the domestic market at retail level is the responsibility of MOPH. The MOPH has no function in the control of pesticide residues in foodstuffs of plant origin intended for export.

The DOA, through APSRDO and the OARDs 1-8 at regional level, is the competent authority for control of pesticide residues in 12 specific plant products intended for export to certain countries, including Member States of the EU.

³ *In their response to the draft report, the competent authority of Thailand noted that “ Under article 2.1 of the Announcement of the Department of Foreign Trade on Stipulation of Kinds or Classes of Vegetables and Fruits Requiring Exportation Certificate B.E. 2546 (2003), it is stated that “The following kinds of pesticide residues shall be under the criteria and procedures of the Department of Agriculture to be analyzed for issuance of a certificate under the conditions of appropriateness and necessity of each kind of vegetable and fruit consisting of 13 organochlorines, 15 organophosphates, 6 pyrethroids, 4 carbamates, 9 fungicides and 6 herbicides.””*

5.2.3. Control activities regarding pesticide residues

5.2.3.1. Planning, scope and results

While there is an overall Food Safety strategy, including for foodstuffs of plant origin intended for export, there is no detailed plan of activities regarding inspections or sampling at any level for the official control of pesticide residues covering all foodstuffs of plant origin intended for export.

The Notification of the Department of Foreign Trade is implemented by requiring the exporters of the 12 specific commodities to obtain a 'Certificate of Pesticide Residues' from the DOA. The Certificate lists 30 substances, all insecticides, sought during the analysis and not the 53 substances contained in the Notification⁴. The Certificate also contains an assessment of compliance with the standards established in the importing country for those substances and must be submitted together with an application for a Phytosanitary Certificate at the time of export. Consignments will not pass through Customs and Excise unless accompanied by the required certificates. There are no mandatory controls for other commodities of plant origin intended for export and there is no legal requirement for an analytical report from a laboratory at the point of export.

All exporters must be registered with the Ministry of Commerce for financial purposes and the MOAC is aware of 125 exporters of foodstuffs of plant origin to the EU. However, unless a Phytosanitary Certificate is required, the MOAC may not be aware of all companies engaged in the export of foodstuffs of plant origin.

5.2.3.2. Inspection and Sampling

Sampling for pesticide residue analysis takes place at export premises at the request of the exporter or at grower or pack-house level where an application for certification under the Food Safety strategy has been submitted.

The mission team observed a sampling procedure for basil and Morning Glory at a pack-house involved in exporting foodstuffs of plant origin to the EU and elsewhere. Sampling was requested by the exporter and the samples were taken by 2 officers from OARD 5. The samples were taken in the cold room where a large quantity of the produce was already packed for sale. The inspectors randomly selected about 20 packs of each commodity, from which a portion was taken and aggregated to provide samples of approximately 1 kg each. The samples were placed in plastic bags, labelled and sealed. The bags were then placed in a polystyrene box, sealed, labelled and given to the pack-house representative for transfer to the Technical One Stop Service (TOSS) of DOA. The TOSS collects a fee for the analysis, enters the details of the samples in a database and forwards the samples to the APSRDO laboratory for analysis. The laboratory sends the analytical results to the pack-house and to the TOSS.

⁴ *In their response to the draft report, the competent authority of Thailand noted that "As stated in the "Announcement of the Department of Foreign Trade on Stipulation of Kinds or Classes of Vegetables and Fruits Requiring Exportation Certificate B.E. 2546 (2003)", pesticide analysis of 12 specific commodities is carried out based on the information on permitted substances for certain pests including monitoring data the insecticide residues are often found. Certain kinds of pests are found in certain kinds of vegetables or fruits. Generally, not all pesticides listed in the announcement are used for the particular commodities."*

Guidance on sampling procedures, which is not binding, was issued in Chapter 3 of the Manual for Exporters of Fresh Fruit & Vegetables, developed under the Food Safety strategy, and is in line with CODEX procedures. It was noted that the officers did not have the appropriate guidance for sampling during the sampling, but were sufficiently knowledgeable to conduct the sampling without having to refer to the guidance.

Data presented to the mission team show that, in 2004, 23,541 samples of the 12 commodities of plant products were analysed for the presence of 30 substances, of which 8,968 samples related to produce intended for the EU. In 2005, the corresponding figures were 19,635 samples analysed, of which 8,297 related to products intended for the EU. Data supplied by the DOA shows that, in 2004, over 8% of samples and, in 2005, over 6% of samples, taken from foodstuffs of plant origin intended for export to the EU, were non-compliant with the EU MRLs established for 30 substances. Non-compliances were most frequently found in durian, lychee, longan, mango and chilli.

5.2.3.3. Follow up of infringements

Consignments of the 12 commodities, found on analysis to contain pesticide residues in excess of the permitted levels in the importing country, will not receive a Certificate of Pesticide Residues and consequently cannot be exported. No other evidence of follow-up was presented.

5.2.4. *Rapid Alert System*

A rapid alert system for Thailand is not operational but is planned.

Since 2001, 25 notifications, issued within the EU system, have involved pesticide residues in foodstuffs of plant origin from Thailand. No evidence of official follow-up to these alerts was provided. However, in the case of notifications issued in May and November 2005, the exporters concerned confirmed, during visits by the mission team, that information concerning pesticide residues was received from their EU customers (importers) but that no contact was initiated by the competent authority. However, the exporters had been contacted by the competent authority regarding notifications concerning microbiological contamination.

The plant commodity from Thailand most frequently notified for the presence of pesticide residues, yard-long beans, is not one of the 12 commodities specified for special controls.

5.2.5. *Laboratories for pesticide residue analysis*

5.2.5.1. Organisation

A laboratory network, comprising of 8 OARD laboratories, the APSRDO laboratory in Bangkok and 6 private laboratories was established by the MOAC across the country and has recently been equipped with a number of chromatographs. The network of 6 private laboratories, 3 of which are accredited to ISO 17025, was established by funding from the MOAC but now operates independently as a limited company. At present, analysis of foodstuffs of plant origin intended for export is conducted in all laboratories, but is mainly conducted in one private laboratory and APSRDO. It was stated by the competent authority that the private laboratories will, in future, be the only laboratories involved in the analysis of the 12

commodities of foodstuffs of plant origin intended for export, with the other laboratories concentrating on supporting the voluntary quality control system.

Three laboratories, analysing samples of foodstuffs of plant origin intended for export, were visited by the mission team. Each had good facilities, divided into specific areas assigned for each analytical step. Samples normally arrive at the laboratories within a short time-span, but it was observed that the samples were not always kept in cool conditions during transport. Identity of samples, particularly at sample reception, is not ensured because samples were not uniquely numbered during sampling and a copy of the sampling form was not attached to the sample.

The APSRDO laboratory had a common reception area where samples of plant protection products for formulation analysis and samples of foodstuffs of plant origin for residue analysis were received, manually registered in a logbook and a reference code allocated. Prevention of cross-contamination was not guaranteed despite the allocation of separate tables for the samples.

5.2.5.2. Resources and training

All of the laboratories visited were well staffed and equipped and regular internal and external technical and quality training programmes are conducted. Table 1 summarises the overall staffing levels and equipment in the laboratories involved in pesticide residue analysis of foodstuffs of plant origin, intended for export, or to support the voluntary quality control system described in Chapter 5.3 below.

Table 1: Staffing and equipment levels in laboratories involved in pesticide residue analysis.

	Private laboratory (visited)	Other private laboratories (5)	APSRDO	OARD laboratories (8 in total)							
Staff*	14	17	70	6	11	5	13	7	10	9	18
Equipment:											
GC	11 ^{***}	29 ^{***}	17	4	2	1	1	5	4	2	2
GC/MS**	6 ^{***}	15 ^{***}	5	1	1	-	-	1	1	1	1
HPLC	14 ^{***}	28 ^{***}	8	1	1	-	1	2	1	1	1
LC/MS**	6 ^{***}	18 ^{***}	-	-	-	-	-	-	-	-	-

* technical staff involved in pesticide residue analysis only

** MS or MS/MS

*** equipment not used exclusively for analyses for pesticides residues

5.2.5.3. Analytical spectrum and methods

All laboratories use the same multi-residue method (Steinwandter H. 1985 modified method). For the 12 specified commodities intended for export, 30 active substances (23 organo-phosphates, 6 pyrethroids and 1 organo-chlorine) are analysed using this method. However, some laboratories are already able to

routinely analyse up to 50 active substances through the inclusion of additional organo-chlorine and carbamate pesticides in the analytical method. Only insecticides are sought and there are no immediate plans to increase the number of analytes in the analytical screen.

The laboratories visited analyse a large number of samples with a time-lapse of less than 2 days between sampling and reporting of the analytical result. However, analyses are usually carried out for only 30 insecticides on 29 plant commodities of plant origin, (12 specified crops and 11 additional crops - rice, young coconut, longon, pineapple, rambutan, coffee, peanut, soybean, orange, sweet corn, banana), 5 grouped crops (*Cruciferae*, *Leguminosae* except peanut and soybean, *Solanaceae*, *Cucurbitaceae*, and herbs), and a group of 'other crops', included in the voluntary quality control system).

5.2.5.4. Quality assurance systems

Of the 3 laboratories visited by the mission team, only one is accredited to ISO 17025, while another laboratory has been audited for accreditation and the remaining laboratory is at an early stage of attaining accreditation.

The laboratories have taken part in a number of recent proficiency tests, such as tests organised by the Australian National Association of Testing Authorities and FAPAS. Reports from 2005 show generally good results for the analytes detected but not all, and in some cases very few, analytes were detected. Validation of the analytical method was not done in one of the laboratories visited.

5.3. Additional voluntary control systems

A Cabinet Resolution, dated 4 March 2003, established a Food Safety strategy, which has been implemented by the DOA since 2004. The strategy includes a voluntary national system which involves certification of farms for Good Agricultural Practice (GAP) and pack-houses for Good Manufacturing Practice (GMP) who engage in the production of 28 products of plant origin, including the 12 commodities mentioned above.

5.3.1. Good Agricultural Practice

The strategy for GAP specifies 8 principles, but it was noted that, at the farms visited, compliance with only some of the principles (Level 1), including checking of water source, growing area, use, storage and application of plant protection products and record keeping, is required⁵. No timelines for introduction of the checks for the remaining principles of pest-free status (Level 2), quality of produce, harvesting and post-harvest treatment (Level 3) was given. A series of Good Agricultural Practice guidelines have been published to assist growers, advisors and inspectors to observe and check the specified principles. It was further noted that

⁵ *In their response to the draft report, the competent authority of Thailand noted that "GAP principles are divided into 3 levels; chemicals residue safe, pest free, and quality attribute. Level 1 is basic principles applied to all GAP farms/ plots. Level 1 is set up due to safety concern regarding pesticide residues in produces."*

specific guidelines have not been produced for yard-long beans⁶ and that a comprehensive list of plant protection products registered for use on the specific crops is not included in any guidelines. However, a limited number of plant protection products are recommended in the guidelines. The strategy provides for free advice to growers and includes inspections of farms and, possibly, sampling of produce for analysis by staff from the OARD.

The mission team visited a number of farms during which it was noted that most vegetable crops receive an application of pesticides on a weekly basis. In the case of one GAP-certified grower visited, who had Level 1 certification only and whose produce was being exported to the EU, more than 40 applications of pesticides were made over the growing and harvesting period of 32 weeks⁷.

There are an estimated 5.8 million farms in Thailand, of which 3.3 million are producing crops. Up to mid-December 2005, applications for certification of over 416,000 plots, totalling almost 628,200 ha have been registered by almost 370,000 farmers. GAP Certificates have been issued for almost 177,000 plots (43% of applicants), representing 251,200 ha (34%) and 139,400 farmers. This means that more than 11% of farmers involved in crop production are registered for GAP and over 4% of crop farmers have certified plots. Successful applicants receive Certificates of GAP and are permitted to use a quality symbol, the 'Q-mark'. Certification is valid for 1 or 2 years depending on the crop.

5.3.2. *Good Manufacturing Practice*

A voluntary system of GMP has been introduced by the DOA for pack-houses, whereby a number of principles regarding the premises, equipment, process control, maintenance and sanitation, transportation and storage, personnel and record keeping⁸ are inspected. A GMP 'Inspection Manual for Packing Houses' is available. Pack-houses which meet the standards are certified and permitted to use the standardised Food Safety symbol, 'Q-mark'. GMP certified pack-houses are supplied by contracted growers or by GAP certified growers. Approximately 330 pack-houses have been certified for GMP and a further 110 are awaiting certification.

In addition, some exporters may register with International quality control systems, which include an element of traceability, so as to provide further assurance to their customers that the products supplied comply with the standards of the importing country.

⁶ *In their response to the draft report, the competent authority of Thailand noted that "There is a GAP guideline for beans not for yard long beans in particular. However, farms/plots producing yard long beans, basically, can follow this guideline with some adjustment."*

⁷ *In their response to the draft report, the competent authority of Thailand noted that "Generally, pesticides application is a preventative measure taking into account of the environmental conditions, the prevalence of pest and disease and the estimated economic threshold. Farmers are encouraged and obliged to apply pesticides according to the pre-harvest interval (PHI) instruction stated in the product label."*

⁸ *In their response to the draft report, the competent authority of Thailand noted that "The principle of traceability is, in fact, included under the principle of record keeping. The inspection performed at pack-houses includes product traceability by all evidences, mostly from the records."*

6. CONCLUSIONS

6.1. Control system for the placing on the market and use of plant protection products

- (1) Legislation for the control of the marketing and use of plant protection products is in place and the competent authorities for marketing and use are clearly defined.
- (2) All plant protection products being placed on the market require prior registration at central level. A simplified registration procedure is operated for generic plant protection products, resulting in many generic products being registered.
- (3) Marketing controls, particularly sampling, take place as a reaction to applications for license to import or manufacture plant protection products. Herbicides constitute almost 70% of pesticide imports. Samples are analysed for identity and content of active substance only.
- (4) Sales outlets for plant protection products require licenses and are frequently inspected but the scope of the inspections is limited. It was not possible to efficiently or effectively follow-up on the previous inspections due to the absence of a written report of deficiencies or non-compliances found.
- (5) Inspections of users of plant protection products are not planned or conducted unless an application for Good Agricultural Practice certification has been submitted by the user⁹.
- (6) The frequency of application of plant protection products is very high.
- (7) The laboratory for formulation analysis is very well equipped and staffed, is in the process of achieving accreditation and is analysing a very large number of samples for content and identity of active substance. Many products on the domestic market were non-compliant for content of active substance.

6.2. Control system for pesticide residues in foodstuffs of plant origin

- (8) The basic legislation for control of pesticide residues is in place but MRLs have been established for less than 5% of the substances on the market in Thailand.
- (9) The competent authorities for establishment of MRLs and for control of pesticide residues in foodstuffs of plant origin intended for export are clearly defined. However, MRLs are not established as part of the registration process for plant protection products.

⁹ *In their response to the draft report, the competent authority of Thailand noted that “Strengthening program and technical development regarding market control of pesticides and GAP document are planned.*

- (10) The mandatory control of foodstuffs of plant origin intended for export is not sufficient because it is limited to only 12 commodities and to only 30 active substances, despite the fact that 53 substances are listed in the legal provisions. None of the additional commodities intended for export are officially controlled.
- (11) The level of non-compliance with EU MRLs for pesticides is high, taking into account the small number of analytes being sought during analysis.
- (12) The sampling procedure was broadly in accordance with the CODEX guidelines for residue sampling. Sampling takes place only as a reaction to a request from the exporter.
- (13) Official follow-up of infringements notified through the EU Rapid Alert System for Food and Feed relating to pesticide residues did not take place.
- (14) The laboratories visited are very well equipped and staffed and operate in adequate facilities, but only some laboratories are accredited to ISO 17025 and a low number of analytes being routinely sought. Nevertheless, the laboratory network has the potential to substantially increase the number of active substances and the number of commodities to be controlled.

6.3. Additional voluntary control systems

- (15) As part of a Food Safety strategy, a voluntary system of quality control, through certification of plots and pack-houses which comply with set principles, is officially checked. However, it is limited in the numbers of commodities and pesticide substances being controlled. To date, just over 4% of crop farmers have certified plots.
- (16) Some exporters have registered with International quality systems to provide additional assurance to their EU customers.

6.4. Overall conclusion

An official pesticide residue control system, for foodstuffs of plant origin intended for export, is in place. The system, as implemented, is limited to 12 economically important commodities and to monitoring of only a small number of pesticides. Overall, the limitations of the official control system provide little assurance that foodstuffs of plant origin being exported to the EU will comply with EU legislation. This raises concerns about compliance with Article 11 of Regulation (EC) No. 178/2002.

7. CLOSING MEETING

A closing meeting was held on 27 January 2006 with the central competent authority, the Department of Agriculture (DOA). At this meeting, the main findings and conclusions of the mission were presented by the inspection team. Following some clarifications, the representatives of DOA accepted these findings and conclusions.

8. RECOMMENDATIONS TO THE COMPETENT AUTHORITIES OF THAILAND

In relation to pesticide residues in foodstuffs of plant origin intended for export to the European Union,

- (1) the competent authority should provide guarantees that official controls comply with, or are equivalent to, European Union standards, in order to ensure that Article 11 of Regulation (EC) No 178/2002 of the European Parliament and of the Council is fulfilled.
- (2) the competent authority should consider the accreditation to ISO 17025 of official control laboratories to ensure the equivalence with Article 18 of Regulation 2076/2005 and to ensure these laboratories provide reliable analytical results. Equivalence to Art 12 (2) of Regulation 882/2004 should be demonstrated by 1 January 2010.
- (3) the competent authority should consider following-up on the notifications, involving foodstuffs of plant origin from Thailand, issued within the European Union Rapid Alert System for Food and Feed.

An action plan in response to the recommendations should be forwarded to the Commission within 2 months of dispatch of the final report. This action plan should clearly set out the manner and deadline by which the competent authorities will address the recommendations.

9. ADDENDUM

In their response to the recommendations contained in the draft report, the Thai authorities stated,

- in relation to Recommendation 1, that “the Department of Agriculture (DOA) is in the process of reviewing the official control system of exported plant commodities as to expand more kinds of commodities based on information received from the mission, RASFF, and the monitoring data.”
- in relation to Recommendation 2, that they are “planning on capacity building of official laboratories involved in pesticide analysis for accreditation of ISO 17025 by the year 2010.”
- in relation to Recommendation 3, that the “DOA’s Focal point is appointed for management of RASFF information. Procedures are set to notify the concerned exporter, require for causes, corrective actions and improvement, and follow-up.”

ANNEX – EUROPEAN LEGISLATION

European Legislation	Official Journal	Title
Regulation (EC) No 178/2002	OJ L 31, 01/02/2002, p.0001 - 0024	Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety.
Regulation (EC) No 882/2004	OJ L 165, 30/04/2004. Corrected and re-published in OJ L 191, 28/05/2004 p. 0001 - 0052	Regulation (EC) No 882/2004 of the European Parliament and of the Council of 29 April 2004 on official controls performed to ensure the verification of compliance with feed and food law, animal health and animal welfare rules.
Regulation (EC) No 852/2004	OJ L 165, 30/04/2004. Corrected and re-published in OJ L 226, 25/06/2004 p. 0003 - 0022	Regulation (EC) No 882/2004 of the European Parliament and of the Council of 29 April 2004 on the hygiene of foodstuffs.
Directive 76/895/EEC	OJ L 340, 09/12/1976, p. 0026 - 0031	Council Directive 76/895/EEC of 23 November 1976 relating to the fixing of maximum levels for pesticide residues in and on fruit and vegetables.
Directive 90/642/EEC	OJ L 350, 14/12/1990, p. 0071 - 0079	Council Directive 90/642/EEC of 27 November 1990 on the fixing of maximum levels for pesticide residues in and on certain products of plant origin, including fruit and vegetables.
Directive 86/362/EEC	OJ L 221, 07/08/1986, p. 0037 - 0042	Council Directive 86/362/EEC of 24 July 1986 on the fixing of maximum levels for pesticide residues in and on cereals.
Regulation (EC) No 396/2005	OJ L 70, 16/03/2005. p. 0001 - 0016	Regulation (EC) No 396/2005 of the European Parliament and of the Council of 23 February 2005 maximum residue levels of pesticide in or on food and feed of plant and animal origin and amending Council Directive 91/414/EEC.
Regulation (EC) No 2076/2005	OJ L 338 22/12/2005. p. 0083 - 0088	Commission Regulation (EC) No 2076/2005 of 5 December 2005 laying down transitional arrangements for the implementation of Regulations (EC) No 853/2004, (EC) No 854/2004 and (EC) No 882/2004 of the European Parliament and of the Council and amending Regulations (EC) No 853/2004 and (EC) No 854/2004.