

Report of Pesticide Residue Monitoring Results of the Netherlands for 2007

**Concerning Directive 90/642/EEC, 86/362/EEC
and Recommendation 2007/225/EC**

Food and Consumer Product Safety Authority (VWA)

Project: NW07140:

October 2007

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SUMMARY

During 2007 about 4400 samples of fruits, vegetables, cereals and processed products of domestic and non-domestic origin were analysed in the national and co-ordinated monitoring program. With respect to fresh products, domestic produce made up 35,9 % of the samples, 29,5 % of the samples were from other EU countries and 31,5 % from non-EU countries. In general, products originating from other countries show higher percentages of MRL-violations than Dutch produce. For the fifth year EU products have shown a decrease in percentage non-compliances. In 2006 and 2007 imports from third countries too showed a decrease in MRL-violations. Probably this is related to the progressing harmonisation of MRL-legislation in the EU and increasing awareness of the trade sector.

Dutch products show residues above the reporting limit in about 45 % of the samples, whereas non-domestic products contain residues in 67 % (EU) and 60 % (non-EU) of the cases, respectively. EU-MRLs covered 66 % of the residues found.

1. INTRODUCTION

Pesticide residue control has been a task of the Dutch Food and Consumer Product Safety Authority (VWA) and its predecesing organisational structures for many years. Therefore, a suitable infrastructure is present for the EU-monitoring as required by directives 90/642/EEC (products of plant origin), 86/362/EEC (cereals) and Recommendation 2007/225/EU (the harmonised specific program 2006).

2. SAMPLING

The samples are taken without prior information about the presence of pesticides in the sample. Therefore, they represent the situation on the market for the product at that time. However, sampling is directed relatively more to products that need attention because of the violation rate in previous years. Therefore, high violation rates can indicate both an efficient sampling strategy and problems in the agricultural practice. As required by EU-directive 90/642/EU, a monitoring plan is made accordingly.

The monitoring program is primarily directed to major products in the consumption pattern, but some capacity is reserved to minor products. The main sampling points are the premises of the auction system for Dutch products, importers, warehouses and distribution centres of retail chains for both domestic and non-domestic products. At those inspection points, it is clear who is responsible for the product, so that appropriate legal action can be taken in case of non-compliance. In 2007 a number of samples was taken in retail shops as part of a pilot project to provide public information on samples, results and responsible companies.

The sampling procedure, i.e. the number of subsamples taken from a lot is regulated by the Dutch Food and Commodity Law. This regulation is the implementation of the EC-directive 2002/63/EU. Inspectors of the five regional inspectorates are taking samples.

3. ANALYSIS AND QUALITY ASSURANCE

One regional laboratory (Northwest, in Amsterdam) performs the analyses of the samples taken by all five regional inspectorates.

The general strategy is detecting as many pesticides as possible in one analysis by using Multi-Residue-Methods (MRMs). The Dutch method consists of an acetone extraction, followed by a partition step of the residues into dichloromethane/petroleum ether. The extracts are analysed by a chromatographic separation and selective detection of residues. The main detection methods are Gas Chromatography (GC) - Ion-Trap Mass Spectrometric Detection (GC-ITD) and Liquid Chromatography – tandem Mass Spectrometry (LC-MS/MS). Only for some analytes that are not detectable sensitively enough by ITD, additionally GC with Electron Capture Detection (ECD) is used.

For some pesticides not amenable to GC, Single Residue Methods based on LC-MS/MS detection are used. In the 2007 program this was the case for chlormequat, propamocarb and ethephon. Dithiocarbamates are analysed as CS₂ using GC-FPD and GC-ITD after decomposing with acidic tin-chloride solution and extraction into iso-octane.

Together the scope of the methods is about 400 analytes.

The validity of the analytical results is governed by a quality assurance system under ISO17025 accreditation. The multi-residue methods are within the scope of the accreditation of the laboratory. The centralised laboratory has implemented the EU Guideline on Quality Control Procedures SANCO 10232/2006. It takes part in FAPAS and EU proficiency tests. In order to check system performance and to avoid false negative results, representative pesticide standard mixtures containing 76 and 156 analytes for GC-ITD and LC-MS/MS respectively are run in each batch of samples at the lowest calibration level (LCL), which corresponds to the reporting limit. For these mixtures, 4-point calibration and recovery checks are performed.

The average inter-laboratory relative standard deviation (RSD_R) is estimated at 25 % based on EU-proficiency tests (see SANCO 10232/2006). The expanded measurement uncertainty applied to reported results is 50 %. In this report, all results above the MRL are considered to be violative. However, legal measures are taken after subtracting the measurement uncertainty from the analytical result.

The applied MRMs and SRMs are recorded and the results are stored. Because of the registration of MRMs and the known scope of the method, also the absence of a residue above the reporting limit can be established.

4. MONITORING RESULTS

During 2007 about 4400 samples, both domestic and non-domestic products, were analysed in the national and co-ordinated monitoring program.

With respect to fresh products, domestic produce made up 35,9 % of the samples, 29,5 % of the samples came from other EU countries and 31,5 % from non-EU countries. In general, products originating from other countries show higher percentages of MRL-violations than Dutch produce.

For the fifth year EU products have shown a decrease in percentage non-compliances. Probably progressing EU-harmonisation contributes to this effect. About 66% of the residue findings is governed by EU-MRLs (Table 1). In 2006 imports from third countries too, showed a decrease in MRL-violations. However, products from South-East Asia still often violate limits. In these cases frequently acute toxic organophosphorous pesticides are involved. It is remarkable that old organophosphates as EPN, monocrotophos and omethoate (without dimethoate) are still in use. Therefore, measures are taken to prevent imports at Schiphol airport.

Dutch products show residues above the reporting limit in about 45 % of the samples, whereas non-domestic products contain residues in 67 % (EU) and 60 % (non-EU) of the cases, respectively. For non-domestic products these figures are lower than those of 2006.

Table 2 gives the most frequently non-complying pesticide/crop combinations with the main countries of origin. Table 3 gives results on main products in the year 2007. A comparison is made with the results of previous years. For the main products in the national program, fewer violations were observed with most of the products, as in general compliance increased.

Some minor products, not planned within the national program show still a considerable violation rate.

Examples are tropical fruits, like mango's and passion fruit.

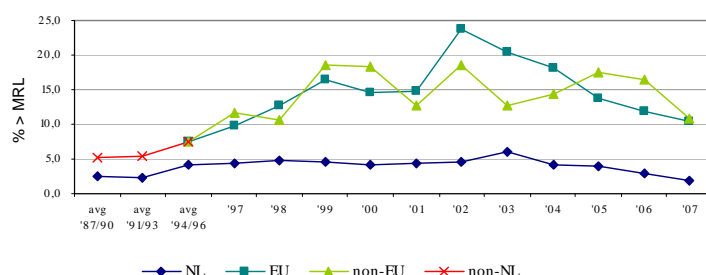


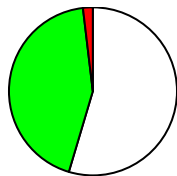
Figure 1. Percentage of MRL violations not including incidents

Table 1. Pesticide residues detected in the EU-coordinated and Dutch monitoring program, with or without an Acute Reference Dose. Table 1a by pesticide, table 1b by residue.

table 1a	number of pesticides (active substances)				
	total	with ARfD	no ARfD needed	ARfD unknown	with EU-MRL
EU-coordinated monitoring	70	48	21	1	56
Dutch national program	107	69	21	5	37
Total	177	117	42	6	93

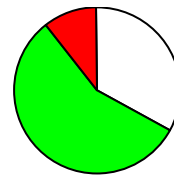
table 1b	number of residues of pesticides in samples				
	total	with ARfD	no ARfD needed	ARfD unknown	with EU-MRL
EU-coordinated monitoring	6487	4213	2272	2	4918
Dutch national program	1988	1323	744	24	656
Total	8475	5536	3016	26	5574

In about 4400 samples about 8500 residues of 177 different analytes were found. EU-MRLs covered 66 % of the residues found. The scope of the EU-coordinated program comprised 76 % of the residues found. For a majority of the results it has been established whether an Acute Reference Dose (ARfD) is necessary or not (table 1).. When food safety issues are involved in pesticide residues, it is mainly with respect to acute effects. Therefore, it is important to notice to what extent pesticides that give acute intake hazards are used. For product/pesticide combinations the Critical Crop/Pesticide Concentration (CCPC) has been evaluated. At this limit 100 % of the ARfD is reached based on a point-estimate and a product is considered to be unsafe and “injurious to health” in the meaning of the General Food Law (Regulation EC/178/2002). In such cases the product is recalled when possible, and a Rapid Alert is issued. The Netherlands issued sixteen rapid or information alerts on pesticide residues, as indicated in table 4.



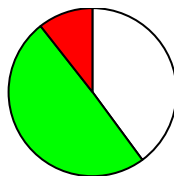
□ No residue ■ Res. <MRL ■ Res. >MRL

Figure 2a. Residues in Dutch products



□ No residue ■ Res. <MRL ■ Res. >MRL

Figure 2b. Residues in products from EU-countries



□ No residue ■ Res. <MRL ■ Res. >MRL

Figure 2c. Residues in products from non-EU-countries

Table 2. Main products with high percentages of non-compliances, with corresponding pesticides and countries of origin.

Product	Pesticides	%>MRL	Countries
Pepper	dimethoate, omethoate, chlorpyrifos, various	24,1	Thailand, Uganda
Sweet pepper	methiocarb, pyrimethanil, fludioxonil, isofenfos-methyl	18,1	Spain
Grape	tebufenpyrad, methomyl, etofenprox	15,1	Italy, India, Greece, Brasil
Tangerines	pyriproxifen, various	12,0	Spain
Legume vegetables	carbendazim, dimethoate, endosulfan, various	11,3	Kenya, Thailand, Dominican Rep., Senegal
Peach/nectarine	no specific	10,5	Spain
Iceberg lettuce	Imidacloprid	10,3	Spain

Table 3. Samples of crops taken in monitoring program 2007, with trends in percentage MRL violations, comparing origin and previous years.

PRODUCT	Consumption (g/day)	Year EU-coordinated program	Dutch program 2007	samples realised 2007	% samples > MRL 2007	% samples > MRL 2007 Dutch	% samples > MRL 2007 EU	% samples > MRL 2007 non -EU	samples a year 2002-2006	% samples > MRL 2002-2006
Tangerines	13,4	97/02/05	125	100	12,0	0,0	11,9	12,5	57	18,1
Orange	93,7	98/02/05	200	174	5,2	0,0	6,2	4,6	117	10,6
Apple	74,4	96/01/04/07	125	133	4,5	0,0	9,8	8,7	101	4,0
Pear	10,8	97/02/05	100	68	0,0	0,0	0,0	0,0	68	3,5
Peach/nectarine	3,5	98/02/07	150	38	10,5	0,0	8,8	33,3	64	16,3
Plum	2,2		50	50	4,0	0,0	3,3	9,1	30	6,0
Grape	14,4	96/01/06	300	271	15,1	20,0	16,9	13,4	201	33,5
Strawberry	4,8	96/01/04/07	150	105	3,8	1,6	3,2	18,2	138	14,2
Banana	19,7	97/02/06	75	59	0,0	0,0	0,0	0,0	34	0,6
Kiwi fruit	2,9		50	58	1,7	0,0	4,0	0,0	26	6,2
Beetroot	4,4		50	38	5,3	0,0	22,2	0,0	14	2,8
Carrot	13,6	98/02/05	125	95	2,1	2,9	0,0	0,0	62	3,2
Onion	14,5	04	75	63	0,0	0,0	0,0	0,0	34	4,1
Tomato	26,9	96/01/04/07	125	131	3,8	2,9	6,4	0,0	106	6,6
Sweet pepper	4,2	99/03/06	200	193	18,1	5,5	29,4	5,6	106	14,9
Pepper	0,0	99/03	150	54	24,1	0,0	16,7	31,6	104	39,0
Cucumber	7,9	00/03/05	125	97	5,2	0,0	6,7	25,0	67	8,1
Melon	3,3	99/03	50	58	3,4	0,0	3,6	3,4	51	5,9
Broccoli	4,9		50	79	2,5	0,0	4,1	0,0	28	3,5
Cauliflower	14,9	99/03/06		57	0,0	0,0	0,0	0,0	47	0,8
Red Cabbage	4,2		18	28	0,0	0,0	0,0	0,0	13	0,0
White Cabbage	6,2	00/04/07	17	26	0,0	0,0	0,0	0,0	17	0,0
Lettuce	4,2	96/01/04/07	200	166	5,4	2,8	10,7	0,0	109	13,8
Iceberg lettuce	3,3	96/01/04/07	0	97	10,3	0,0	18,5	0,0	53	7,1
Endive	7,3		125	83	3,6	1,6	12,5	0,0	77	8,6
Spinach	8,9	98/02/05	125	75	4,0	4,1	5,6	0,0	50	9,6
Beans(fresh)	3,2	97/02/05	175	137	8,0	4,2	7,7	9,2	102	14,8
Peas (fresh)	12,6	00/03/06	100	64	10,9	0,0	0,0	11,1	33	9,1
Leek	12,3	04/07	75	69	0,0	0,0	0,0	0,0	45	5,8
Potato	172,6	97/02/05	75	65	3,1	0,0	0,0	11,8	52	4,3
Rice	10,1	00/03/05	50	18	0,0	0,0	0,0	0,0	18	0,0
Wheat	130,6	00/03/04/06	100	28	0,0	0,0	0,0	0,0	28	0,0
Babyfood			125	94	0,0	0,0	0,0	0,0	0	0,0
Processed products			175	321	4,0	0,0	1,0	11,3	0	0,0
Products in program	695,4		3675	3192	6,4	1,3	10,2	9,1	2054	12,7
Total	838,8		4500	4394	7,4	1,8	10,5	10,8	3316	12,3

Table 4. Alerts to the RASFF system issued by the Netherlands.

Product	Pesticide	Country
aubergines	methamidophos (0,17 mg/kg)	Surinam
bitter melons, sopropo	dimethoate, omethoate,(various levels)	Surinam
cucumber (organic)	oxamyl (0,57 mg/kg)	Egypt
curry leaves	triazophos (5,9 mg/kg)	India
French beans	carbendazim (6.6 mg/kg)	Surinam
grapes	methomyl (0,29; 0,83 mg/kg)	Peru, Egypt
grapes	carbofuran (0,022; 0,04; 0,14 mg/kg)	Brazil
lettuce	dimethoate (1,3 mg/kg), omethoate (0,3 mg/kg)	France
mango	prochloraz (14; 9,9;7,5 mg/kg)	Unknown, Brazil
okra	monocrotophos (0.2 mg/kg)	India
water spinach	methamidophos (9,7 mg/kg)	Vietnam
wine	carbaryl (1,4 mg/l)	Chile
yard long bean	triazophos (1,2 mg/kg), dimethoate (0,31 mg/kg), omethoate (0,29 mg/kg)	Thailand