

Current figures at a glance

Total number of samples analysed	Number of sample countries	Samples without active substance	Samples with active substance
25,627	73	12,393 (48.4%)	13,234 (51.6%)

Evaluation period:
1 October 2018 to 30 September 2019

A close eye on the residues of plant protection products: More than 25,000 fruit and vegetable samples on the test bench

In the current issue of the Monitoring-Report Fruit, Vegetables, Potatoes, *Deutscher Fruchthandelsverband e.V. (DFHV)* and *QS Fachgesellschaft Obst-Gemüse-Kartoffeln GmbH (QS)* take a close look at the residue situation for pesticides in fruit and vegetables in the period from October 2018 to September 2019. In addition to an overview of the results of 25,627 evaluated samples, the Monitoring-Report 2020 contains special residue evaluations for apples, bananas, blueberries, peppers, chinese cabbage and cucumbers. This issue again contains interesting background information for experts, including the planned reduction of the maximum residue level (MRL) for chlorpropham and the effects of further selected MRL changes.

For the Monitoring-Report, which has been published once a year since 2010, QS and DFHV have jointly evaluated more than 200,000 fruit and vegetable samples for pesticide residues and carried out 54 detailed analyses of individual products. An important contribution to more transparency in the fruit and vegetable value chain.

Samples analysed per continent (Top 10)



AFRICA
NUMBER OF SAMPLES (TOTAL): 1,997
NO MRL EXCEEDANCE: 1,738
EXCEEDANCE RATE: 13.0%

	Samples per country	Samples with MRL exceedance*
Madagascar	596	162
South Africa	568	54
Morocco	366	22
Egypt	217	12
Kenya	96	8
Senegal	31	0
Zimbabwe	21	0
Ivory Coast	19	0
Namibia	16	0
Ethiopia	11	0



EUROPE
NUMBER OF SAMPLES (TOTAL): 20,154
NO MRL EXCEEDANCE: 19,958
EXCEEDANCE RATE: 1.0 %

	Samples per country	Samples with MRL exceedance*
Germany	12,782	67
Spain	2,487	44
Netherlands	1,795	5
Belgium	1,186	23
Italy	1,059	38
Austria	241	0
France	219	4
Portugal	114	0
Greece	91	8
Hungary	61	3



NORTH/SOUTH AMERICA
NUMBER OF SAMPLES (TOTAL): 2,395
NO MRL EXCEEDANCE: 2,262
EXCEEDANCE RATE: 5.6%

	Samples per country	Samples with MRL exceedance*
Brazil	513	31
Peru	471	48
Chile	447	10
Colombia	205	11
Costa Rica	182	9
Uruguay	173	11
Ecuador	150	1
Mexico	91	3
Dominican Republic	55	4
Argentina	43	1



ASIA/PACIFIC
NUMBER OF SAMPLES (TOTAL): 1,081
NO MRL EXCEEDANCE: 972
EXCEEDANCE RATE: 10.1 %

	Samples per country	Samples with MRL exceedance*
Turkey	376	69
Israel	245	8
China	201	19
India	113	1
New Zealand	77	0
Malaysia	21	3
Vietnam	20	3
Thailand	18	4
Australia	3	0
Indonesia	2	0



Overview of MRL exceedances

Samples with MRL exceedance*:	697
Exceedance rate (total):	2.7%
Exceedance rate Germany:	0.5%
Exceedance rate EU (excluding Germany):	1.8%
Exceedance rate non-EU countries:	9.1%

*Based on the actual value (measured without taking into account an expanded measurement uncertainty of ±50 percent)



Bananas

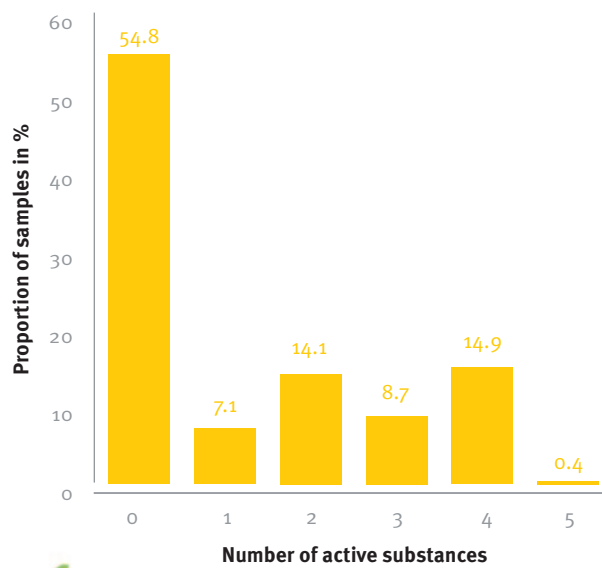
A total of 241 banana samples from eleven countries of origin were on the test bench. The complaint rate is very satisfactory and not "crooked" at all: it is only 0.8%.

Of a total of 241 analysed samples, over 61% came from Ecuador (148 samples), followed by Colombia (27 samples) and Peru (22 samples). More than half of the samples (54.8%) were residue-free, another 7.1% contained only one active substance.

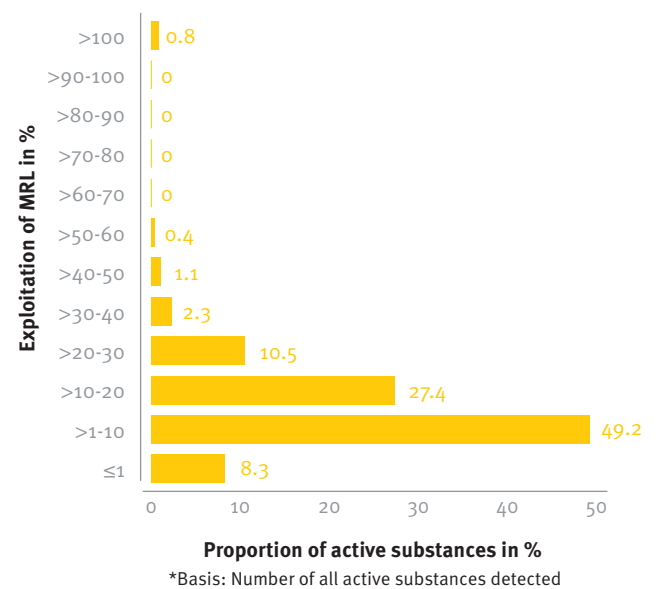
In the remaining 92 samples (38.1%), two or more active substances were detected, including almost one third of all samples from Ecuador. The only sample with five active substances came from Costa Rica. MRLs were used up to a maximum of 30% in 95.4% of all analysis results and were thus well below the limit values.

Only two samples from Costa Rica exceeded the legal maximum residue levels, both for the insecticide *buprofezin*. In total, it was possible to analyse 15 different active substances, the most commonly detected were the fungicides *thiabendazole* and *imazalil* (every 5th sample), followed by *azoxystrobin* (every 6th sample), *myclobutanil* (every 12th sample) and *fosetyl-AI* (in almost every 20th sample). *Bifenthrin*, *chlorpyrifos* and *buprofezin* were among the most frequently detected insecticides.

NUMBER OF ACTIVE SUBSTANCES DETECTED PER SAMPLE



PERCENTAGE OF MRL EXPLOITATION OF ACTIVE SUBSTANCES*



Apples

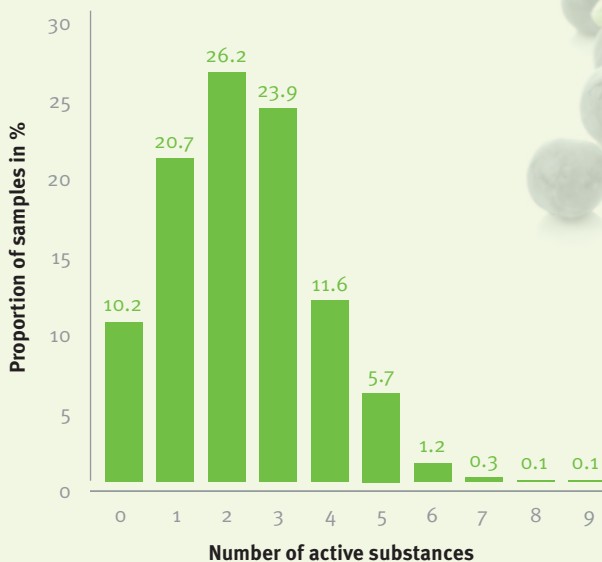
All is well with the apple at MRL capacity: almost 85% of the active substances detected only used up to a maximum of 10%.

70.8 % of the analysed samples presented one to a maximum of three active substances. In 17.3% of the remaining samples, the detection of four to five and in a further 1.7% six to nine different pesticide active substances were detected per sample. In total, 40 different active substances were detected during the evaluation.

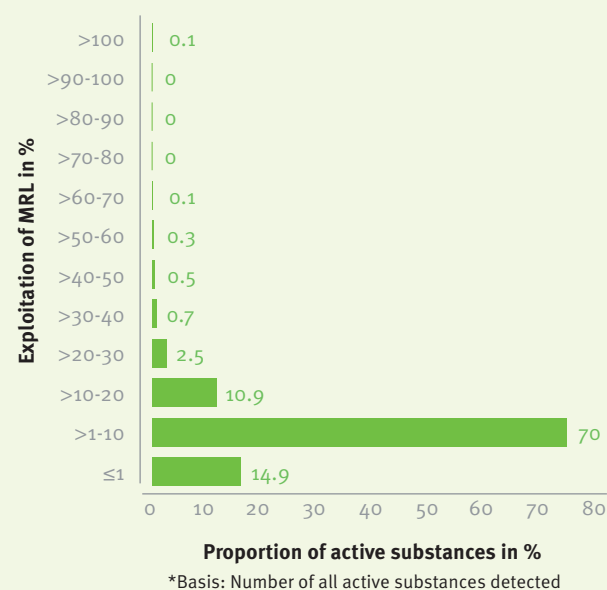
For 84.9% of the detections, the concentration rate reached a maximum of 10% of the MRL. The MRL was exceeded in five cases (0.1%). One exceedance concerned the active substance *chlorpyrifos* and four others the active substance *2-phenylphenol* (also known as *orthophenylphenol*). This active substance is mainly used as a preserving agent for the surface treatment of citrus fruits and is not approved for apples.

The most frequently detected substances were the fungicides *captan* (1,257 samples), *dithianon* (468 samples) and *trifloxystrobin* (461 samples). The 1,847 apple samples analysed came from 15 countries of origin. The majority came from Germany (1,379 samples) and Austria (205 samples).

NUMBER OF ACTIVE SUBSTANCES DETECTED PER SAMPLE



PERCENTAGE OF MRL EXPLOITATION OF ACTIVE SUBSTANCES*



Blueberries

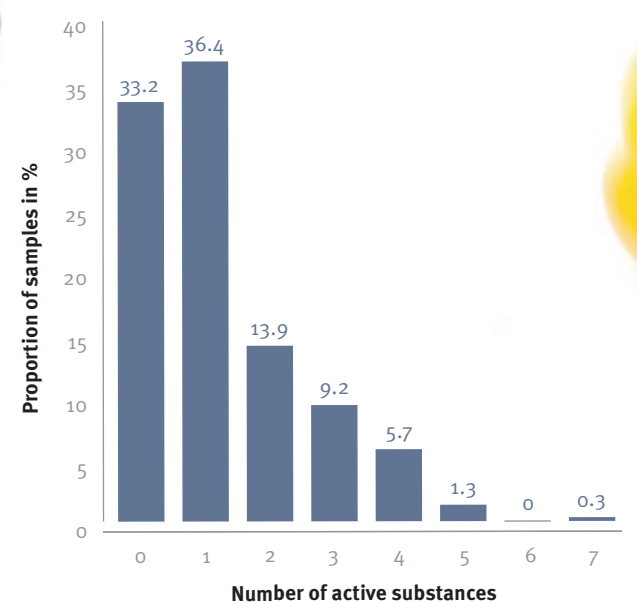
316 blueberry samples from 14 countries were part of the evaluation: For 86% of the active substances detected, the maximum concentration was 30% of the MRL.

With 144 samples, almost half of the analysed samples were from Germany. This was followed by 60 samples from the EU, mainly from Spain (34 samples), and 112 samples from non-EU countries, of which half were from Peru (71 samples).

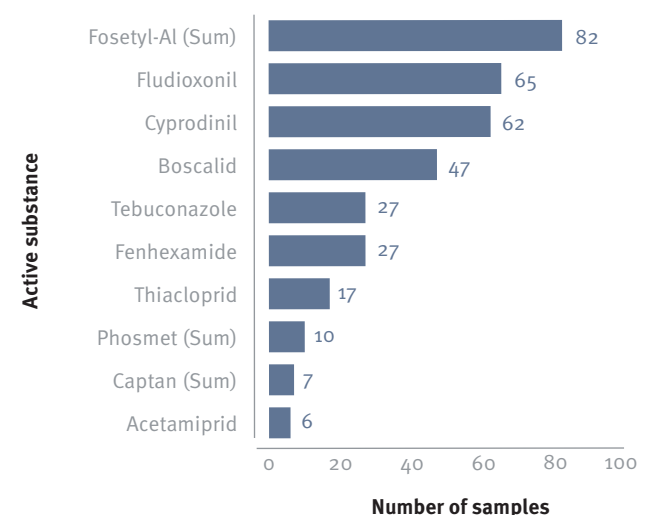
Nearly 70% of all samples contained none (33.2%) or only one active substance (36.4%). Of the samples with two or more active substances, 56% were from Chile and 42% from Germany. The only sample with seven active substances detected came from Peru.

A total of 32 different active substances were substantiated, most frequently the fungicides *fosetyl-AI* (almost every 4th sample), *fludioxonil* (every 5th sample) and *cyprodinil* (almost every 6th sample). The MRL concentration shows a positive picture: 86% of the detected substances only reached a concentration of a maximum of 30% of the MRL. Exceedances were found in 33 samples (10.4%), including 29 samples from Peru and one sample from Argentina for *fosetyl-AI*. In April 2019, the MRL for the active substance was raised, reducing the rate of exceedance. Three samples from Germany showed MRL exceedances (2x fungicide *dithianon*/1x repellent *picaridin*).

NUMBER OF ACTIVE SUBSTANCES DETECTED PER SAMPLE



TOP-10 OF THE DETECTED ACTIVE SUBSTANCES





Cucumbers

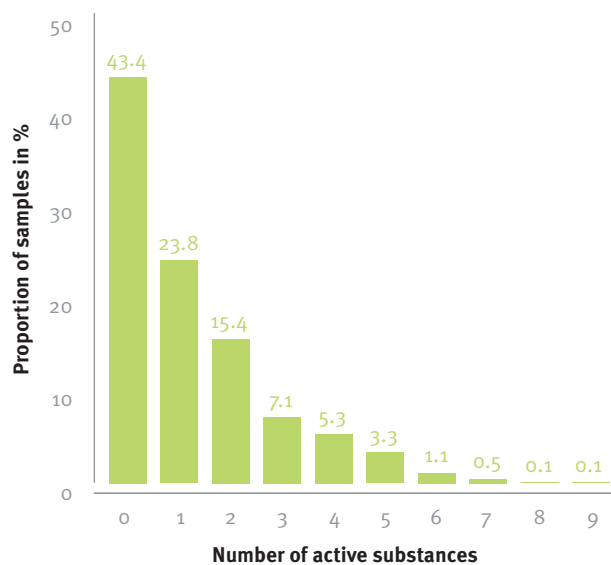
761 cucumber samples from eight countries were analysed for residues of plant protection products. Positive: in 330 samples (43.4%) no active substances were found.

In the remaining 431 samples, a total of 50 different plant protection active substances were found. Of these, 352 samples contained one to three active substances, representing approximately 46.3% of the total number of samples. The most frequently detected substance overall was the fungicide *propamocarb* (246 detections).

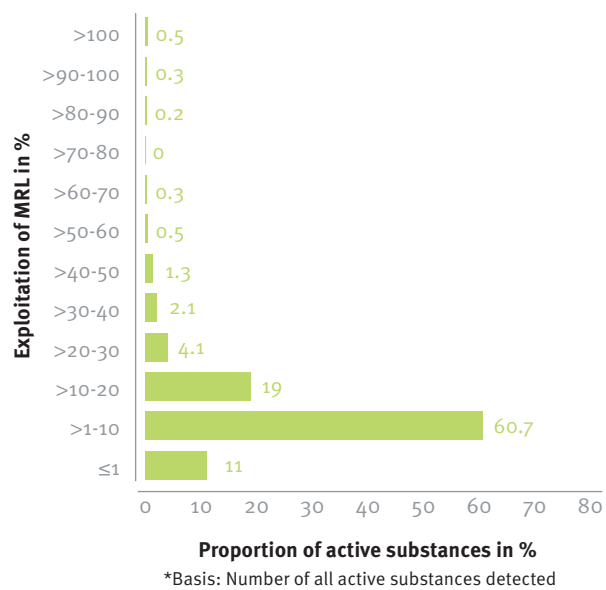
In 71.7% of the detections, the concentration of the active substances reached 10% of the maximum residue limit. MRL exceedances were only detected in five cases (0.5%). In these cases, the detected substances were *dithiocarbamates*, *carbendazim*, *flonicamide*, *thiacloprid* and *propamocarb*.

All analysed samples were from the EU, with the largest shares coming from the Netherlands (250 samples), Spain (224 samples) and Germany (210 samples).

NUMBER OF ACTIVE SUBSTANCES DETECTED PER SAMPLE



PERCENTAGE OF MRL EXPLOITATION OF ACTIVE SUBSTANCES*



Peppers

For the Monitoring-Report QS and DFHV evaluated 924 pepper samples. 44.2% of all samples contained no residues of plant protection products.

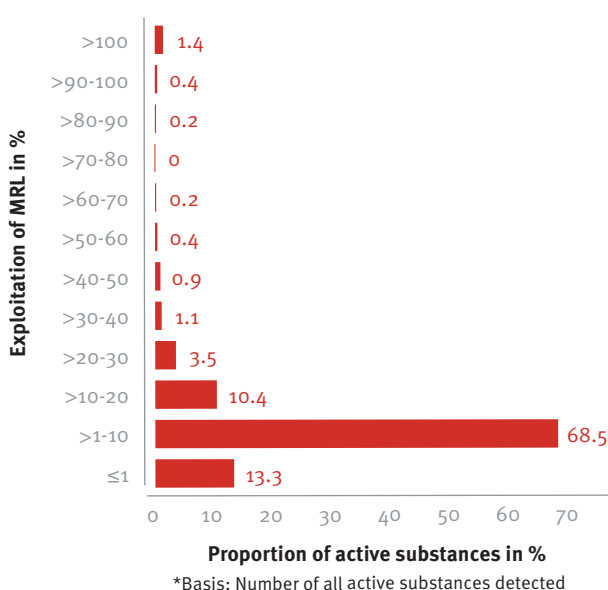
704 samples, so three quarters (76%) of the samples examined, came from the EU (excluding Germany), of which 314 samples were from the Netherlands and 307 from Spain. A further 125 samples were from German goods and 95 samples from non-EU countries, mainly Morocco.

Positive conclusion: 44.2% of all samples were residue-free, including 76% of the German, 55% of the Dutch and 30% of the Spanish goods.

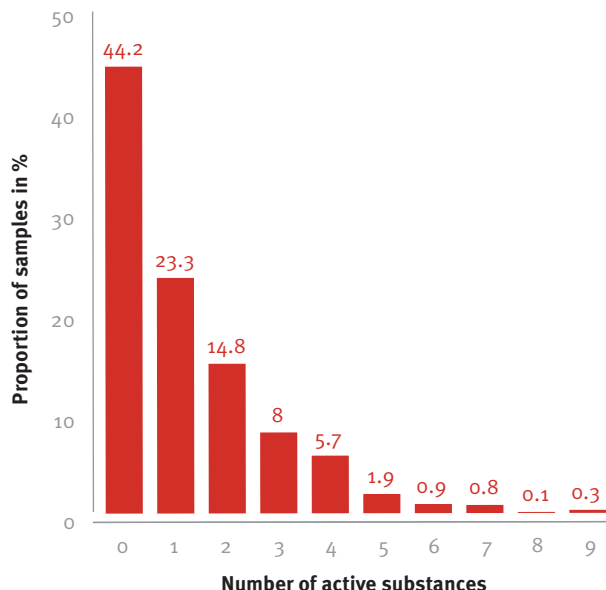
A further 38.1% of the pepper samples contained only one or two active substances. One sample from each Morocco, Spain and Turkey contained 9 active substances. For almost 96% of the analysis results the MRLs were only used up to a maximum of 30%. The 15 MRL exceedances recorded concerned the active substances *acetamiprid*, *chlorpyrifos*, *flonicamid*, *pirimiphos-methyl* and *tau-fluvalinate*, among others.

Overall, more than 60 different active substances were detected, most frequently the fungicides *fluopyram*, *flutriafol*, *fludioxonil* and *azoxystrobin*, followed by the insecticides *chlorantraniliprol* and *pyridalyl*.

PERCENTAGE OF MRL EXPLOITATION OF ACTIVE SUBSTANCES*



NUMBER OF ACTIVE SUBSTANCES DETECTED PER SAMPLE



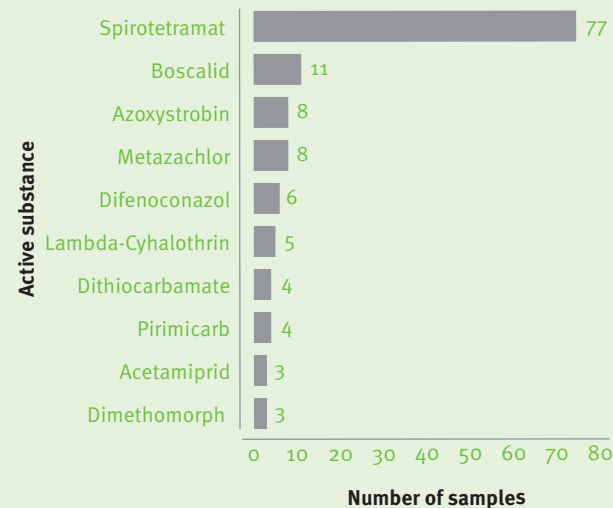
Chinese cabbage/pak choi

QS and DFHV evaluated 194 chinese cabbage / pak choi samples. Nearly half of them (47.4%) did not have any residues of plant protection products.

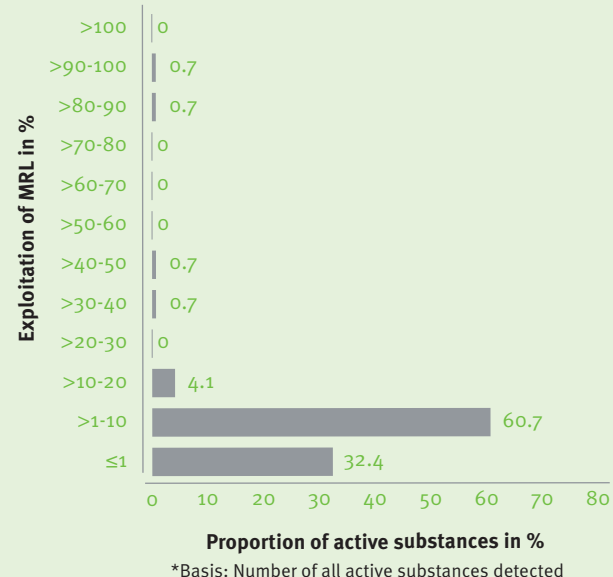
The analysed samples mainly came from Germany (161 samples), followed by the Netherlands (14 samples) and Spain (13 samples) in the second and third places. 47.4% of all samples contained no active substance and a further 46.9% contained one to two active substances. Only five samples (2.6%) were found to contain the active substances of four different plant protection products.

The MRL concentration is positive: 93.1% of the detected active substances contained up to a maximum of only 10% of the legal maximum levels. A further 4.1% of the detected substances presented a concentration between 10% and 20% of the MRLs and only 2.8% between 30% and 100%. Also, very satisfactory: none of the chinese cabbage/pak choi samples exceeded the MRLs. 17 different active substances were detected in total. The insecticide *spirotetramat* was detected in 77 samples (39.7%), the most common.

TOP-10 OF THE DETECTED ACTIVE SUBSTANCES



PERCENTAGE OF MRL EXPLOITATION OF ACTIVE SUBSTANCES*



Perchlorate New maximum levels shall apply from 1 July 2020

In October 2019, the EU member states unanimously adopted the draft EU Regulation for stipulating maximum levels (ML) of *perchlorate* in food. This provides a ML of 0.05 mg/kg for various fruit and vegetable crops, 0.1 mg/kg for cucurbitaceae/kale and 0.5 mg/kg for leaf vegetables/herbs. According to the EU, the limit values for *perchlorate* defined in *SANTE 10126/2019* are expected to apply from July 1, 2020.

But what consequences will the newly defined MLs for *perchlorate* have in the practice: In a study carried out by QS and DFHV, *perchlorate* was found in ten product groups (see Fig. 1). In six cases (1.1%) an exceedance of the ML applicable from 1 July 2020 would be registered (see Fig. 2).

Fig. 1 AMOUNT OF SAMPLES ANALYSED FOR PERCHLORATE AND PERCHLORATE DETECTION

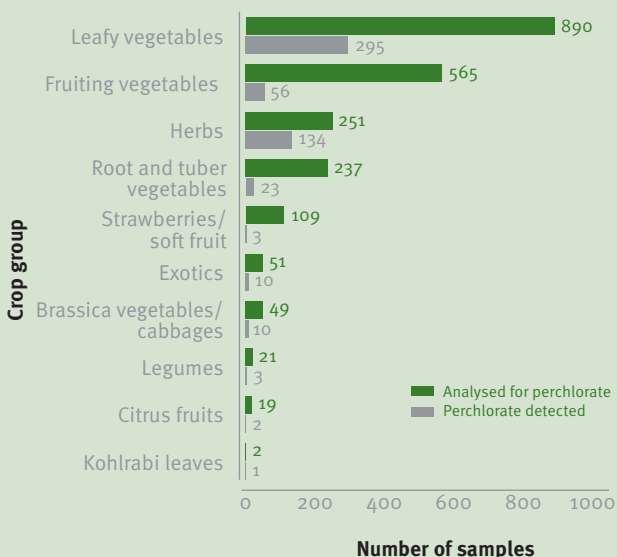
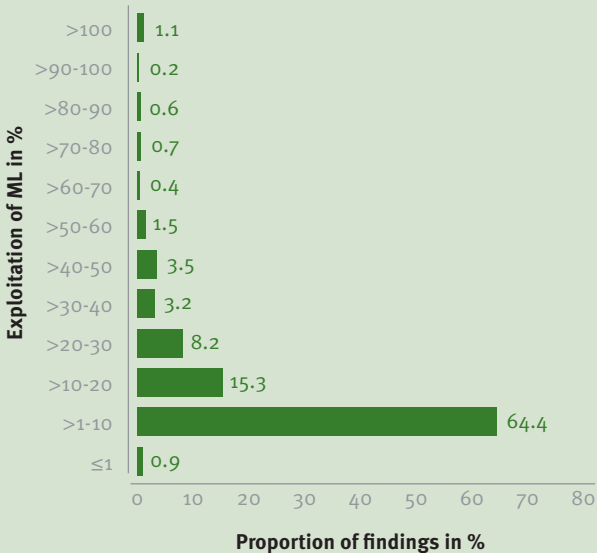


Fig. 2 PERCENTAGE EXPLOITATION OF THE MAXIMUM LEVELS EXPECTED TO APPLY FROM 1 JULY 2020



Topics in focus

Effects of MRL/ML adjustments

Several MRL adjustments are currently unsettling the entire fruit and vegetable industry. QS and DFHV explored the consequences of the planned MRLs of *chlorate* and ML of *perchlorate* on certain crop groups in terms of the MRL concentration. Romain Cools from the World Potato Congress (WPC) provides his assessment on the likewise planned MRLs reduction for *chlorpropham*.

Chlorpropham

Approval not renewed, MRL reduction threatens

The EU Commission decided in June 2019 not to renew the approval for the active substance *chlorpropham*. In Germany, all approvals for plant protection products containing *chlorpropham* expired on 31 July 2019. They are now subject to a sales period until 31 January 2020 and a use-by period until 8 October 2020. The EU member states revoke the approvals for plant protection products with the

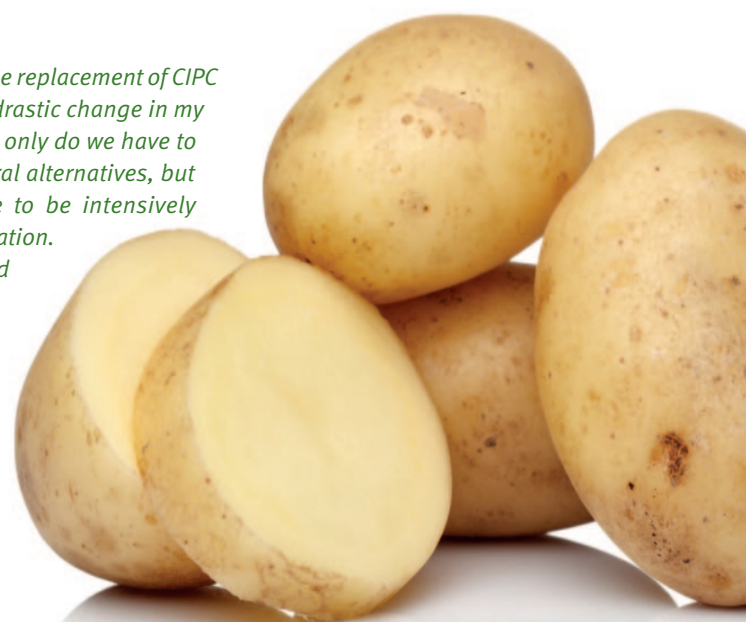
active ingredient *chlorpropham* by 8 January 2020 at the latest. This is usually followed by a reduction of the MRL. For *chlorpropham* it can also be assumed that the MRL will be lowered after the end of the use up period. The exact date and amount had not been defined by the editorial closing of this issue.



The withdrawal procedure and the replacement of CIPC in the potato sector is the most drastic change in my 30 year career in our sector. Not only do we have to learn how to work with the natural alternatives, but also all storage facilities have to be intensively cleaned to avoid cross contamination. As this is a food safety related issue, as well the competent authorities as the value

chain itself will install stringent control measures on potatoes and potato products. It's crucial for all operators to take this serious and for quality schemes to highlight this issue in the guidelines and monitoring procedures.

ROMAIN COOLS, PRESIDENT OF THE WORLD POTATO CONGRESS



Chlorate

Binding MRLs planned in the course of 2020

An EU-wide ban on the use of plant protection products containing the active substance *chlorate* has been in force since 2010. In addition to use as a pesticide, however, there are other pathways of entry (e.g. drinking water). In recent years, it has been discussed about the legal framework governing the MRLs and how they should be implemented. It is expected that in February 2020 there will be vote on a draft EU regulation (according to *Regulation (EC) No 396/2005*), which provides binding MRLs for *chlorate* in different crops and crop groups without any transitional provisions.

Figure 3 shows that *chlorate* was detected in 12 crop groups, particularly in leafy and fruiting vegetables. From the perspective of the currently proposed MRLs (*SANTE 10684_2015 Rev.8*), exceedances of the MRL would be registered in 12 out of 364 samples (3.3%) (see Fig. 4). The affected crops are *strawberry (outdoor/Germany)*, *grapefruit (Mexico)*, *melon (Honduras)*, *small radish (greenhouse/Netherlands)*, *cucumber (Netherlands)*, *tomatoes (1 from Belgium, 5 from Spain)* and *courgettes (Spain)*.

Fig. 3 AMOUNT OF SAMPLES ANALYSED FOR CHLORATE AND CHLORATE DETECTION

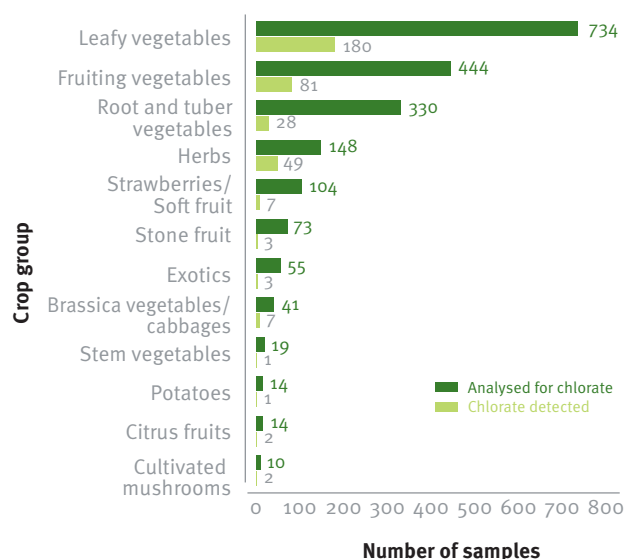
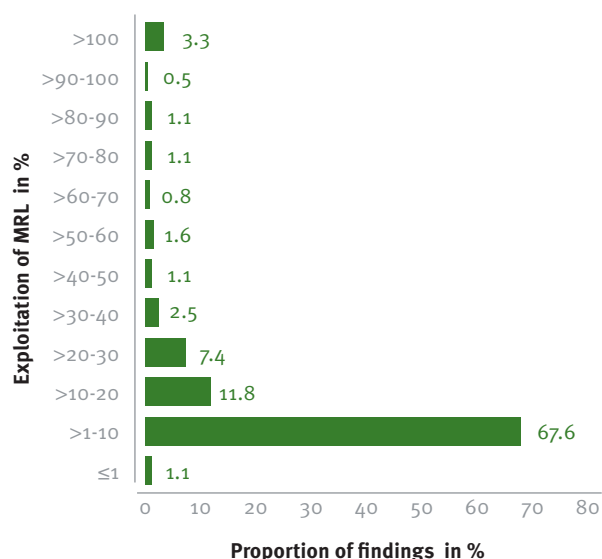


Fig. 4 PERCENTAGE EXPLOITATION OF THE PROPOSED MAXIMUM RESIDUE LEVELS



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