Issue 2015

monitoringreport

A Publication of QS Fachgesellschaft Obst-Gemüse-Kartoffeln GmbH and DFHV Deutscher Fruchthandelsverband e.V.

Under the Microscope: Residue Monitoring in Fruit and Vegetables

Analysis of 17,306 Samples from 73 Countries

Between 1 October 2013 and 30 September 2014, the Deutscher Fruchthandelsverband e.V. (DFHV) and QS Qualität und Sicherheit GmbH collected and analysed a total of 17,306 samples for this monitoringreport. In 38.4% of the analysed samples, no residues of plant protection products whatsoever were detected. Only 0.85% of samples had to be rejected for exceeding the maximum residue level.

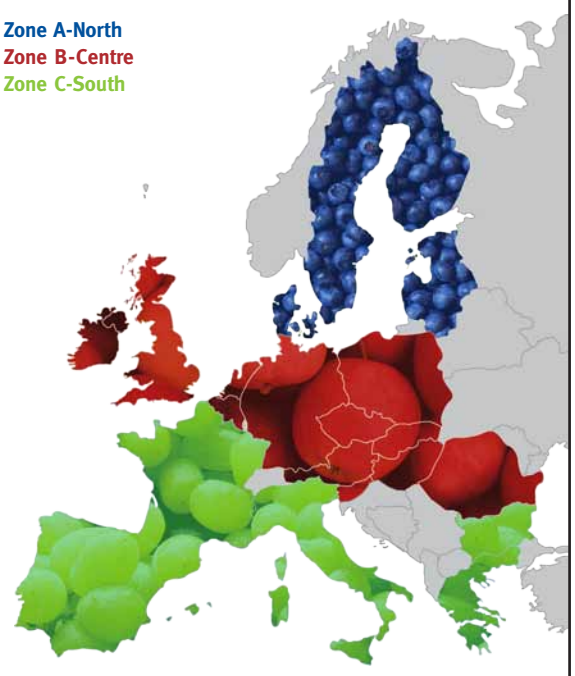
These figures mean that the rejection rate has been steadily decreasing in the last years. While the rejection rate was 2.6% in 2006, it had decreased to 1.3% by 2013 and amounted to just 1.1% in the last analysis year. The most frequently analysed product groups were stone fruit, followed by fruit vegetables such as peppers or tomatoes and lettuces.

Plant Protection Products in the EU

Zonal Approval: Status Quo and Outlook

Plant Protection Products in Europe
Zonal Approval

Zone A-North
Zone B-Centre
Zone C-South



Many users were very optimistic about the introduction of zonal approval in June 2011. The new regulation promised to be an important step towards the harmonisation of plant protection product approvals in the EU. Previously, plant protection products in the EU were approved by national authorities at the level of the individual member states.

In the course of zonal approval, the EU was divided into three different zones (see figure), which means that it is now possible for applicants to apply for approvals for multiple member states at the same time. In this process, one of the member states, acting as a representative of the others, carries out an evaluation. Based on this evaluation, the other states subsequently grant approval in a shortened procedure.

Peter Verbaas, Dr. Hans-Dieter Stallknecht and Raf de Blaiser report on the current status of the implementation of zonal approval from a practical perspective in the Netherlands, Germany and Belgium.

Peter Verbaas
Secretary General of Frugi Venta

Effective plant protection products are necessary for the production of healthy agricultural plants. In addition to those products that are already available, we urgently need new and safe plant protection products. The zonal approval of plant protection products is an important tool for improving the availability of plant protection products and harmonising their use throughout Europe. An additional important advantage is that a low-cost and fast approval procedure can enable plant protection products to be brought into practical use quickly.

Despite available zonal approval, the national approval of plant protection products that is still practised today in the individual EU states is very complex and contradicts the basic concept of the zonal approval system. A mutual recognition system between the member states would be simpler and run more smoothly.

Dr. Hans-Dieter Stallknecht
CEO Bundesausschuss Obst und Gemüse

To date, the high hopes held by fruit and vegetable producers with respect to the zonal approval of plant protection products have not been met. The statements in the German federal government's report on harmonising plant protection product approval from 2014 show that comparable availability of plant protection products in the EU is still a long way off. The report describes the various ways in which efforts are being made to speed up the procedure. Nonetheless, there are no concrete solutions in place for a faster, harmonised zonal approval system and a mutual recognition arrangement.

In order for harmonisation at a national level to be taken seriously, we should move away from national evaluations regarding the approval and evaluation report from a reporting member state. Zonal approval only works when there is trust in the reporting member state. Close cooperation of the partner authorities is required in the context of zonal approval. The approval authorities are called upon here. Work must focus on standardising data requirements, evaluation principles and risk management measures: these are challenges that must be met by means of policies from Brussels as soon as possible. Different interpretations should no longer be possible! New active substance data should be evaluated in a standardised manner throughout the EU and not at a national level; otherwise, the harmonisation we are aiming for will lead to a dead end. Another urgent requirement is the harmonisation of instructions for use, areas of application and the "culture tree".

Raf de Blaiser
Director of Kenniscentrum voor Duurzame Tuinbouw (KDT)

The relevant parties in Belgium responded positively to the possibility of zonal approval, because it allows greater harmonisation in plant protection product legislation to be achieved. A number of zonal approval procedures have been completed successfully in this way, such as the approval of "Tracer" (Spinosad) for certain crops. Belgium acted as the reporting state in this case, while the United Kingdom, the Netherlands and Germany were the affected member states.

Unfortunately, however, it has not been possible to successfully complete all approval applications. In the future, therefore, the member states need to show greater willingness to check the submitted applications promptly and thoroughly, formulate comments if necessary, and ultimately accept and recognise the evaluations performed. In this context, trust in the evaluations of other member states certainly needs to be increased.

Number of Samples per Country

EUROPE	**14,739**
Albania	1
Austria	236
Belgium	1,206
Belarus	2
Bulgaria	2
Cyprus	4
Denmark	2
France	153
Germany	8,805
Greece	94
Hungary	19
Italy	1,016
Malta	1
Netherlands	1,148
Poland	26
Portugal	29
Romania	2
Serbia	1
Slovakia	2
Spain	1,981
Switzerland	8
United Kingdom	1
AFRICA	**666**
Algeria	1
Angola	1
Burkina Faso	5
Central African Republic	1
Egypt	193
Equatorial Guinea	1
Ethiopia	3
Ghana	1
Guinea	1
Ivory Coast	12
Kenya	8
Madagascar	3
Mali	4
Morocco	122
Namibia	18
Senegal	15
South Africa	264
Tanzania	1
Tunisia	1
Uganda	3
Zimbabwe	8
ASIA PACIFIC	**530**
Afghanistan	1
Australia	4
China	29
Dem. Rep. of Korea	3
India	211
Iran	1
Israel	100
Malaysia	9
New Zealand	90
Russia	3
Saudi Arabia	1
Thailand	13
Turkey	64
Vietnam	1
NORTH /SOUTH AMERICA	**1,371**
Argentina	31
Brazil	164
Canada	3
Chile	332
Columbia	94
Costa Rica	85
Dominican Republic	6
Ecuador	375
Guatemala	6
Honduras	3
Mexico	9
Panama	4
Peru	236
Puerto Rico	8
United States	5
Uruguay	10
Total	**17,306**

DATENBANKEN QS UND DFHV IM AUSTAUSCH WELTMARKTDATEN AKTUELL

contents

monitoringreport

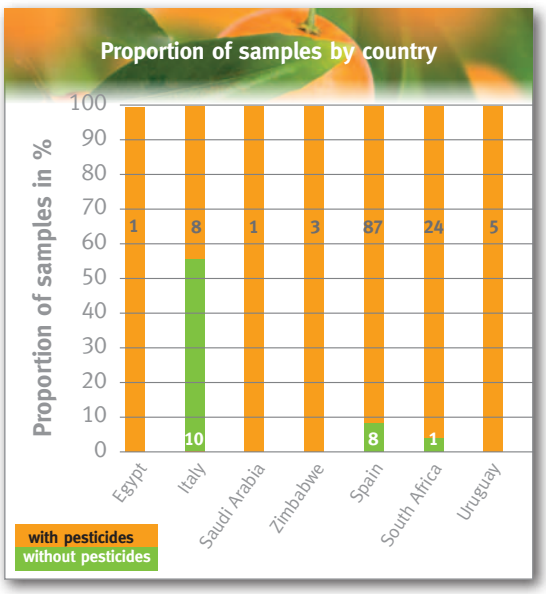
QS Fachgesellschaft Obst-Gemüse-Kartoffeln GmbH and DFHV Deutscher Fruchthandelsverband e.V.

Orange

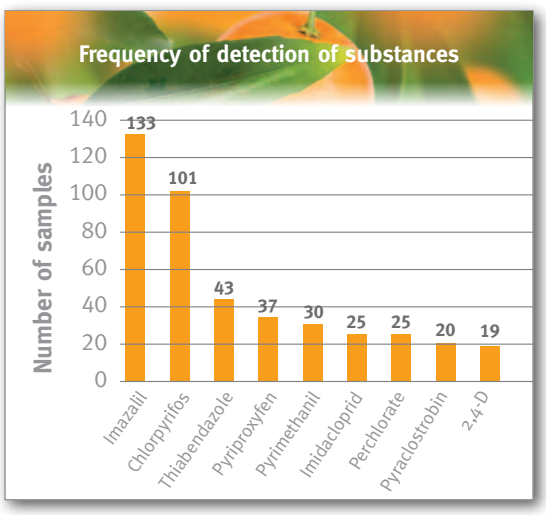
Positive results for the citrus fruit

Sweet, fruity and healthy: The orange, which originates from China, is a cross between a mandarin and a grapefruit. It was brought to Europe for the first time by sailors in the 16th century and is the most commonly cultivated citrus fruit in the world today. A total of 148 orange samples were tested for residues of plant protection products in the context of the DFHV's 4fresh monitoring programme. The samples came from a total of seven different countries. The encouraging result was that no sample needed to be rejected for excessive residue levels.

The products originated mainly from Spain (64%), followed by South Africa (17%) and Italy (12%). Although residues were detected in the vast majority of samples, 20% only contained one active substance, and a further 46% contained two to three active substances. Samples with one active substance came exclusively from Europe (Italy, Spain), samples with four to five active substances exclusively from Spain and South Africa, and samples with more than five active substances only from South Africa. All detected residue levels were below the legal limits. In 80% of all analysis results, they reached a maximum of 30% of the respective prescribed maximum residue level.



The most frequently found active substances were the fungicides imazalil, tiabendazole, pyrimethanil and pyraclostrobin, as well as the insecticides chlorpyrifos, pyriproxyfen and imidacloprid. Tiabendazole and imazalil are so-called surface treatment agents which are used after harvest to prevent the formation of mould. The skin of citrus fruits can be treated with preservatives, as long as the active substances are approved and the maximum residue levels are adhered to.

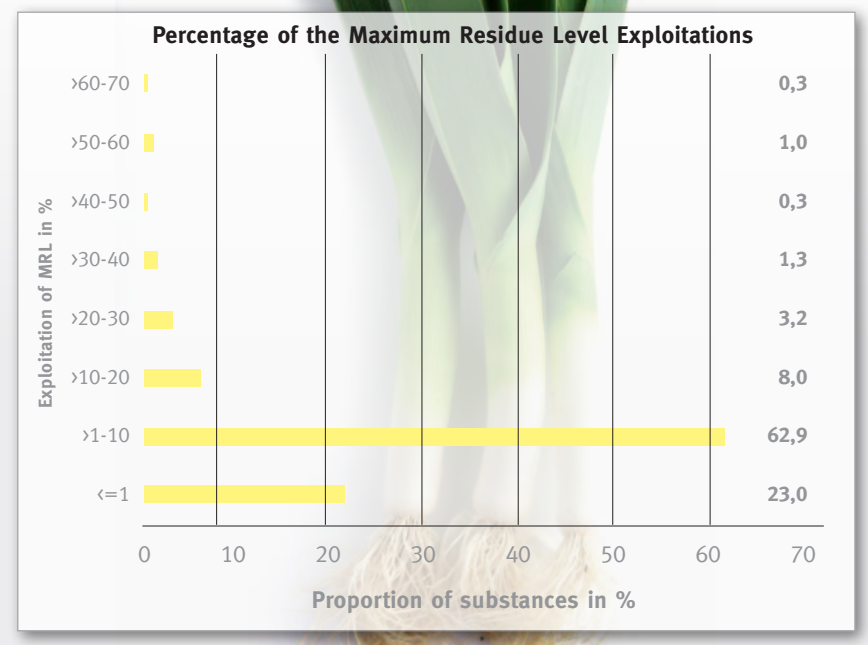


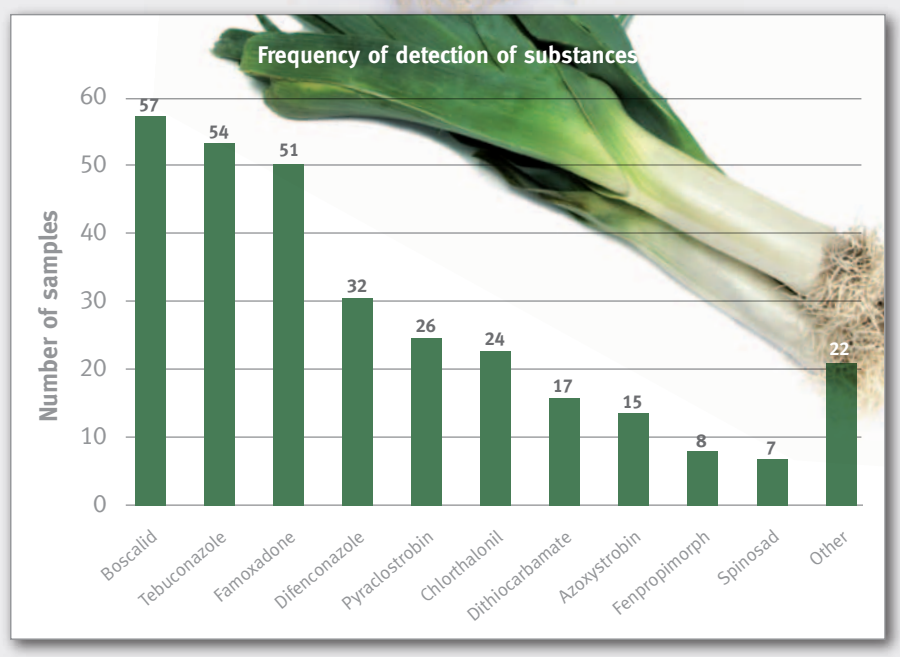
Leek

Beyond Reproach

Very healthy with a bitter taste: leek contains iron, potassium, vitamin C and sulphuric essential oils, which are said to have anti-inflammatory properties and aid digestion. During the testing period, DFHV and QS analysed a total of 312 samples from six countries for plant protection product residues. More than 90% of the analysed samples originated from Germany and Belgium.

In almost 60% of the samples, no detectable residues whatsoever were found. Overall, approximately 75% of the tested samples contained a maximum of one active substance. In 48 cases, that is in 15.4% of the analysed samples, residues of more than two different active substances were detected. During the analyses, 22 different active substances were found. The most frequently found substances were the fungicides boscalid, tebuconazole and famoxadone. Where residues were found in samples, they only reached a small percentage of the respective maximum levels in most cases. For example, approximately 86% of detected active substances only reached 10% or less of the set legal limit. 93.6% of the active substances reached a maximum of 20% of the maximum levels. The maximum residue levels were not exceeded in any case. The check relating to the approval status of the detected active substances also had a positive result: no forbidden active substances were found. This means that no leek sample had to be rejected.





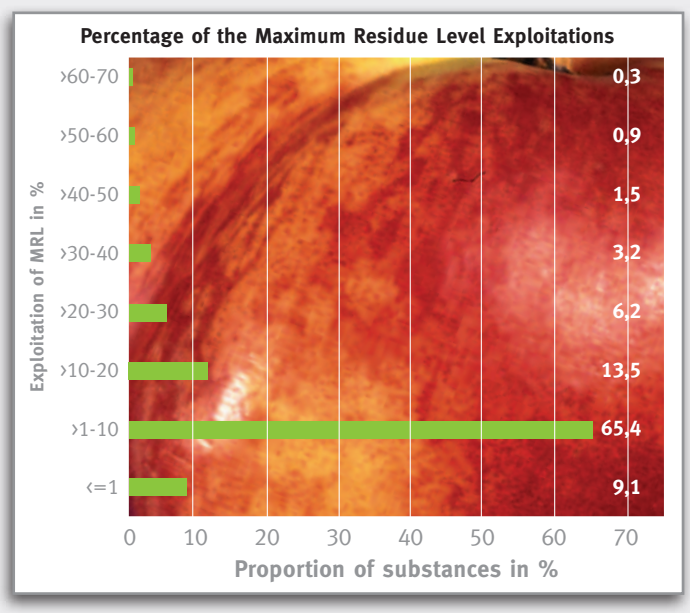
Nectarine

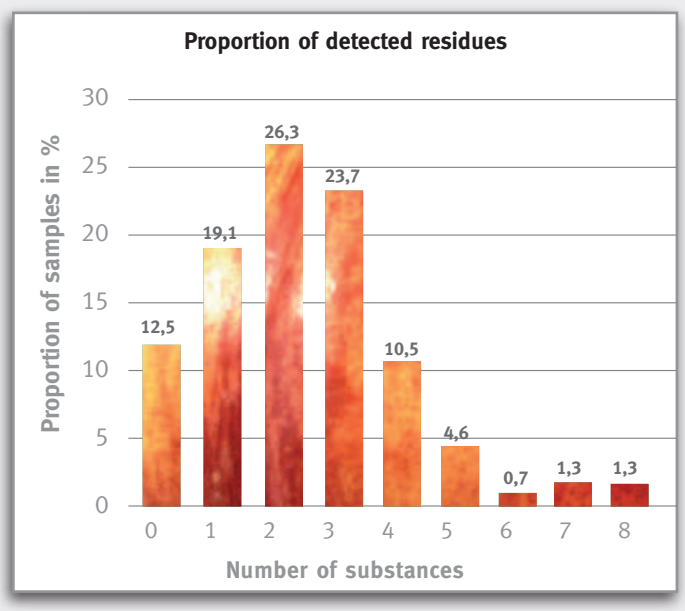
No Complaints about the "Smooth Peach"

It is often claimed that a nectarine is a cross between a plum and a peach. In fact, the stone fruit is a hairless, smooth variety of peach. The "smooth peach" also differs from its haired counterpart due to its lower water content and higher sugar content. DFHV and QS analysed a total of 152 samples during the testing period. The vast majority of the samples originated from Spain and Italy.

Individual samples from Chile, France, Egypt, Morocco and South Africa were also analysed. In 31.6% of all analysed samples, either no residues whatsoever or residues of only one active substance were found. Over 50% of the samples in which residues were detected contained two or fewer active substances. Overall, a large number of different active substances were identified, whereby the most frequently found substances were the fungicides tebuconazole, iprodione and boscalid. Together, these substances represent one quarter of the substances found.

The evaluation of the percentage of the maximum residue levels reached by the detected substances shows a positive result: in almost three quarters of the detected substances, at most 10% of the legal maximum levels was reached. Furthermore, no sample was found exceeding the legal maximum levels or containing active substances that were not permitted in the country of cultivation. This means that no sample had to be rejected.





Celeriac

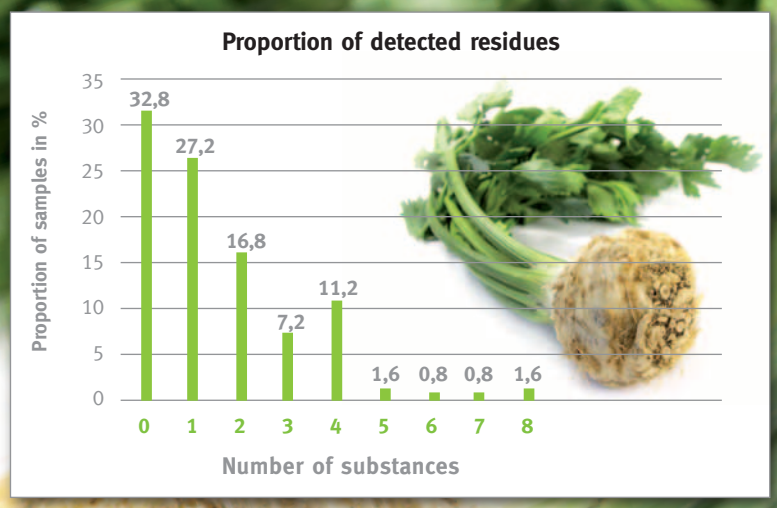
Top Marks for the Winter Vegetable

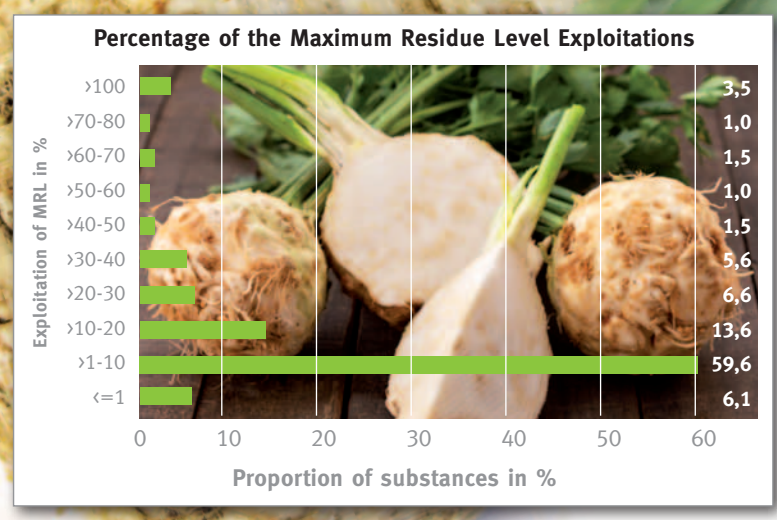
Celeriac lends a special flavour to winter dishes such as soups, casseroles and gratins. The root vegetable has this special flavour thanks to its high levels of essential oils which, together with its calcium, iron and vitamin content, make it extremely valuable from a nutritional perspective. The sample results achieved should also contribute to the popularity of celeriac: 30% of the tested samples were completely free of detectable plant protection product residues.

Between 1 October 2013 and 30 September 2014, QS and DFHV analysed a total of 125 celeriac samples from Germany, Belgium and the Netherlands. A majority of the samples - 66% - came from Germany, followed by Belgium with 26.4% and the Netherlands with 7.2%. 60% of these samples contained either no residues or residues of a maximum of one active substance. With respect to the samples in which residues were detected, almost 80% of these samples reached no more than 20% of the respective legal maximum residue level.

Eight samples, which represented 6.4% of the total number of samples, had to be rejected*. Reasons for the rejection were either exceedance of the legal limits or the detection of forbidden active substances. The forbidden active substances included the insecticide chlorpyrifos, the fungicides iprodione and mandipropamid, and the sprout inhibitor chlorpropham, the residues of which probably resulted from cross-contamination. Overall in the tested samples, a total of 26 different active substances were identified, although half of these were only detected once or twice. The most frequently detected substances of which residues were found were difenoconazole and azoxystrobin, which can be used in a combined preparation.

*The measured value was assessed without consideration of the analytical measuring uncertainty of +/-50%.





Question Time

The 10 Most Important Tips for Sampling

By Dr. Felix Lippert

Testing fruit and vegetables for pesticide residues is done by means of a trace analysis, which can detect even the smallest concentrations. This analysis is the last step in a long chain of conditions which lead to a qualitatively and quantitatively verifiable level of target substances. There may be deviations between the measuring results of products in the same batch as a result of mutually reinforcing errors. Most frequently, in up to 80% of cases, the type, quality and time of sampling contribute to this variation in measuring results. Adhering to the following ten principles will aid in proper performance of sampling.

1. Responsibility
Only qualified personnel who work according to standardised procedures should be employed. The samplers process each batch in the same way without reservation (for example relating to supplier, country of origin) in order to avoid any personal influence on the random sample.

2. Random sample definition
The random sample is a very limited quantity of material from a larger batch. The quantities are defined in Art. 64 LFGB (German Food and Feed Code) Loo.oo-7, which prescribes up to 2 kg or up to 10 units, depending on the product. For this quantity to correspond to the large batch in terms of its composition, i.e. for it to be representative, material should be taken from different, randomly selected sampling locations (palettes, field sections, tree position). “Worst case samples” are excluded from this requirement.

3. Clear assignment
Mixing up sub-batches (lot numbers, sorts, origins etc.) must be avoided at all costs. These could have been treated differently in terms of plant cultivation, meaning that it will no longer be possible later to trace their combination in the laboratory result back to one single batch.

4. Sampling, product-specific
Active substances are distributed differently on the various plant parts. For this reason, the products should be prepared in such a way that they are ready for sale (e.g. lettuce cleared) to ensure a representative sample. In this way, for example, the stem proportion of herbs has a significant influence on the active substance content. “Worst case samples” are excluded from this requirement.

5. Sampling, contaminant-free
Contamination and chemical reaction processes of the samples must be avoided. Food-safe tools should be used for this purpose (PE bags, PE gloves, ceramic knives, etc.). Carry-over of active substances between random samples should be systematically avoided (change gloves, wash knives).

Dr. Felix Lippert
Owner of Hortkinetix

6. Sample combination
The random sample is combined in food-safe sample bags or the original container (package). Pre-packed items (e.g. tomatoes in flow pack) are taken in their declared pre-packaging and combined into a collective sample. Loose goods (e.g. apples, oranges in trays) and field samples are combined in a sample container.

7. Sample preparation
Particularly in the case of bulky products (white cabbage, watermelon), it makes sense to prepare the samples by providing cut segments to the laboratory. This has the advantage that the sample quantity can be limited and representativeness is increased at the same time. However, this approach means that the samples are more perishable, which should be considered when it comes to storage and transport. The risks of degradation of the active substances and contamination are also higher.

8. Packaging
Each sample needs to be sealed in such a way that mixing with other samples is avoided, particularly if sap could leak out during transport (strawberries). In some cases, it may be necessary to use additional fill material as padding. The aim must be for the sample to enter the laboratory in the same condition as it was in at the time of sampling.

9. Documentation
All data that is to be included in the analysis report later should be supplied with the sample in the form of a sampling protocol (which should not have contact with the sample!). The protocol should be signed by the sampler and sample provider and represents the laboratory order at the same time. The laboratory order comprises the analyses to be carried out and/or the customer specifications. It also specifies system-relevant special orders (QS database).

10. Sample delivery
Products should be handled with care during storage and delivery so that they reach the laboratory in an intact state. Cooling may be advisable.

In autumn of 2015, the BVEO, DFHV and QS will jointly offer a series of training courses on sampling which will cover in detail the particularities of representative sampling. Course dates and further information will be available soon.

monitoringreport

QS Fachgesellschaft Obst-Gemüse-Kartoffeln GmbH
and DFHV Deutscher Fruchthandelsverband e.V.

QS
Contamination Risks During Cultivation

Recognising, Taking Account of and Minimising Risks

By Jochen Kreiselmaier

"We detected pesticide residues with an unauthorised active substance in your vegetables. We are therefore unable to market these goods." Notices like this often come as a surprise to producers. They are unaware of any wrongdoing because they know that they did not use the active substance in question. So where did it come from? Experiences in the last years show that such findings of active substances can often originate from drift or transfer of active substances from neighbouring areas or can be attributed to inadequate tank cleaning of the field sprayer.

Risk Factor Drift/Transfer of Active Substances

Particularly in regions with a high cultivation density and in the case of small cultivation areas, there is a high risk of transfer of active substances from and to neighbouring surfaces. Even when good agricultural practice is followed and the latest technology is used, it is not possible to carry out surface treatment within the surface borders with 100% accuracy. When "normal" nozzles are used, approximately 1% of the applied quantity is detected in soil sediments of the neighbouring cultivation area at a distance of one metre from the sprayer boom (source: Basic Drift Values, JKI, Braunschweig). This value can be reduced to 0.1% through the use of injector nozzles, which decrease drift by 90%. However, this value is still too high, as almost every molecule is detectable nowadays. Moreover, transfer of dust (wind erosion) can result in the carry-over of active substances to neighbouring surfaces if plant protection product residues are still clinging to soil particles. In hot weather, there is the possibility of plant protection product residue being transferred during its vapour phase (depending on its steam pressure).

Not all plant protection products used pose the same risk. In principle, the following applies: the higher the amount of active substance applied per hectare, the greater the possible transfer of the active substance. For example, if we compare the two plant protection products Boxer and Karate Zeon, it becomes clear that there are very significant differences. In the case of the soil herbicide Boxer (800 g/l prosulfocarb), up to 4000 grammes of active substance can be applied per hectare. Compared to the insecticide Karate Zeon (100 g/l lambda-cyhalothrin), for which the output limit is 7.5 millilitres per hectare, Boxer's active substance volume is 533 times greater. The risk of a detectable transfer of the active substance is correspondingly higher. The location of a cultivation area also affects the risk of the transfer of undesired active substances. Because of the application method (axial fan) still frequently used for tall-growing crops (e.g. fruit, wine), there is a higher risk of the transfer of active substances to neighbouring surfaces in the vicinity of such crops.

Risk Factor Tank Cleaning

In the course of the continuous refinement of analytical systems, cleaning of the plant protection sprayer has gained in importance. The amount of an active substance that can remain in the device as technical residue, despite complete emptying of the nozzle, is often underestimated. Depending on the design of the sprayer, this quantity lies between 0.7% and 3.8% of the tank content. If, for example, 1 hectare of potatoes was treated with 5 l/ha Boxer (800 g/l prosulfocarb), 2.8 to 15.2 grammes of prosulfocarb remain in the technical residue in the sprayer. Even if dilution takes place according to good agricultural practice (1:10), technical residue of 2.8 to 15.2 grammes of prosulfocarb remains after application to the previously treated surface area. If the sprayer is filled again without further cleaning, this quantity is distributed in the new spray solution that is applied. This low quantity is enough to contaminate a subsequently treated crop with undesired residues. For example, 15.2 grammes of the active substance are enough to contaminate 15,200 kilogrammes of vegetables per hectare with 1.0 milligrammes of prosulfocarb per kilogramme at the next application

Jochen Kreiselmaier
Dienstleistungszentrum Ländlicher Raum (DLR)
Rheinpfalz

Measures for Minimising the Transfer Risks

- Use of drift-reducing nozzle technology (injector nozzles, boundary nozzles)
- Compliance with the guidelines for good agricultural practice (wind: ‹ 5 m/s, travel speed max. 8-10 km/h, humidity › 30%, temperature ‹ 25°C, spray bar 50 cm over target surface)
- Careful planning of spraying times (weather, direction of wind, harvest date of neighbouring crops)
- "Safety zone" to neighbouring surface area (untreated strips at edge of surface area)
- Selection of cultivation area: consider drift risks (e.g. from tall-growing crops)
- Intensive cleaning of plant protection sprayer (continuous cleaning of tank interior)

Even with careful observance of all listed measures, the possibility of a transfer of undesired active substances in the field can never be fully ruled out.

DFHV
Advanced Further Training for Quality Managers

From social standards, to statistical evaluations, all the way to current certification requirements: the FrischeSeminar – the DFHV further training platform – offered a diversified training programme in 2014. In addition to expanding their specialist knowledge, the participants also valued the intensive exchange of experiences with colleagues during the course of the seminar.

Following the slogan "From practice, for practice", each training course was highly practice-oriented. In the "Plant Protection Strategies and Quality Assurance, Effects on Marketing Fruit and Vegetables" seminar, for example, the participants received a real insight into current research work in the area of plant protection during a visit to the research institution at the University of Bonn's Faculty of Agriculture. In the "Know-How: Statistical Evaluations in the Fruit Sector – More Reliability in the Creation and Interpretation of Key Figures and Graphics" further training course, a focus was placed on the direct conversion of numerical data into tables and graphics on the participants' own laptops.

Utmost Concentration in Statistics Seminar

Frische Seminar
Die Bildungsplattform des
Deutschen Fruchthandelsverbandes e.V.

unterstützt von FRUIT LOGISTICA

DFHV Seminar Dates 2015

18 February	Quality and Incoming Goods Inspections, Specialist Seminar (Basic), Bonn **FULLY BOOKED**
25 February	Market Seminar on Fruit and Vegetables – For Existing and Aspiring Insiders, Specialist Seminar (Basic), Bonn
17 March	Banana Ripening, Specialist Seminar (Basic) in Cooperation with International Fruit Import Company Weichert GmbH & Co. KG, Hamburg
18 March	Market Seminar – Fruit Vegetables, Root Vegetables, Bulb Vegetables -, Specialist Seminar (Basic) in Cooperation with Agrarmarkt Informations-GmbH, Bonn
19/20 March	Merchandise Knowledge in the Fruit and Vegetable Sector, Trainee Seminar, Bonn
24 March	Importing Organic Fruit and Vegetables from Third Countries: Legal Framework, Practical Implementation and Residue Monitoring, Specialist Seminar (Advanced), Bonn
15 April	"This Apple Doesn't Taste Good": Basics of Sensory Systems in Fruit and Vegetables, Specialist Seminar (Basic), Bonn
21 April	Importing Fruit from A to Z, Specialist Seminar (Basic) in Cooperation with IPD (Import Promotion Desk), Bonn
22 April	Market Seminar – Stone Fruit, Berries, Grapes, Bananas – Specialist Seminar (Basic) in Cooperation with Agrarmarkt Informations-GmbH, Bonn
May	Maritime Fruit Transport – The Journey of a Refrigerated Container, Specialist Seminar (Advanced) in Cooperation with Hamburg Süd, Hamburg
7 May	HACCP in Practice – Leadership and Management Tool, Specialist Seminar (Basic), Bonn
20 May	Cool Storage of Fruit and Vegetables: Planning, Intralogistical Processes and Costs, Specialist Seminar (Advanced) in Cooperation with Fraunhofer Institute for Material Flow and Logistics, Dortmund
10 June	Quality and Incoming Goods Inspections – Focus on Vegetables, Specialist Seminar (Basic), Bonn
3/4 Sept	Merchandise Knowledge in the Fruit and Vegetable Sector, Trainee Seminar, Bonn
14 – 18 Sep 28 Sep – 2 Oct	Fruit Trader Seminar, IHK (Chamber of Industry and Commerce) Certificate Course, Bad Honnef **FULLY BOOKED**
24 Sept	Market Seminar – Stone Fruit, Exotic Fruits, Citrus Fruits – Specialist Seminar (Basic) in Cooperation with Agrarmarkt Informations-GmbH, Bonn
7 October	Quality and Incoming Goods Inspections – Focus on Fruit, Specialist Seminar (Basic), Bonn
22 October	Market Seminar – Cabbage, Stem Vegetables, Mushrooms, Herbs – Specialist Seminar (Basic) in Cooperation with Agrarmarkt Informations-GmbH, Bonn

DFHV

QS. Ihr Prüfsystem für Lebensmittel.

imprint

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