



Mehrfachrückstände in Lebensmitteln und Mehrfachexposition gegenüber Pestizid-Rückständen

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Mehrfachrückstände von Pestiziden in Lebensmitteln

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Risikobewertung im Zulassungsverfahren von Pflanzenschutzmitteln (PSM)

chronische Exposition ↔ ADI
akute Exposition ↔ ARfD

Basierend auf Rückstandsdaten des Antragstellers

Konservatives Berechnungsmodell (EFSA PRIMo rev. 2)

Für jeden Wirkstoff getrennt

Risikobewertung mit Daten aus Pestizid-Monitoring

chronische Exposition ↔ ADI
akute Exposition ↔ ARfD

Basierend auf **Monitoringdaten**

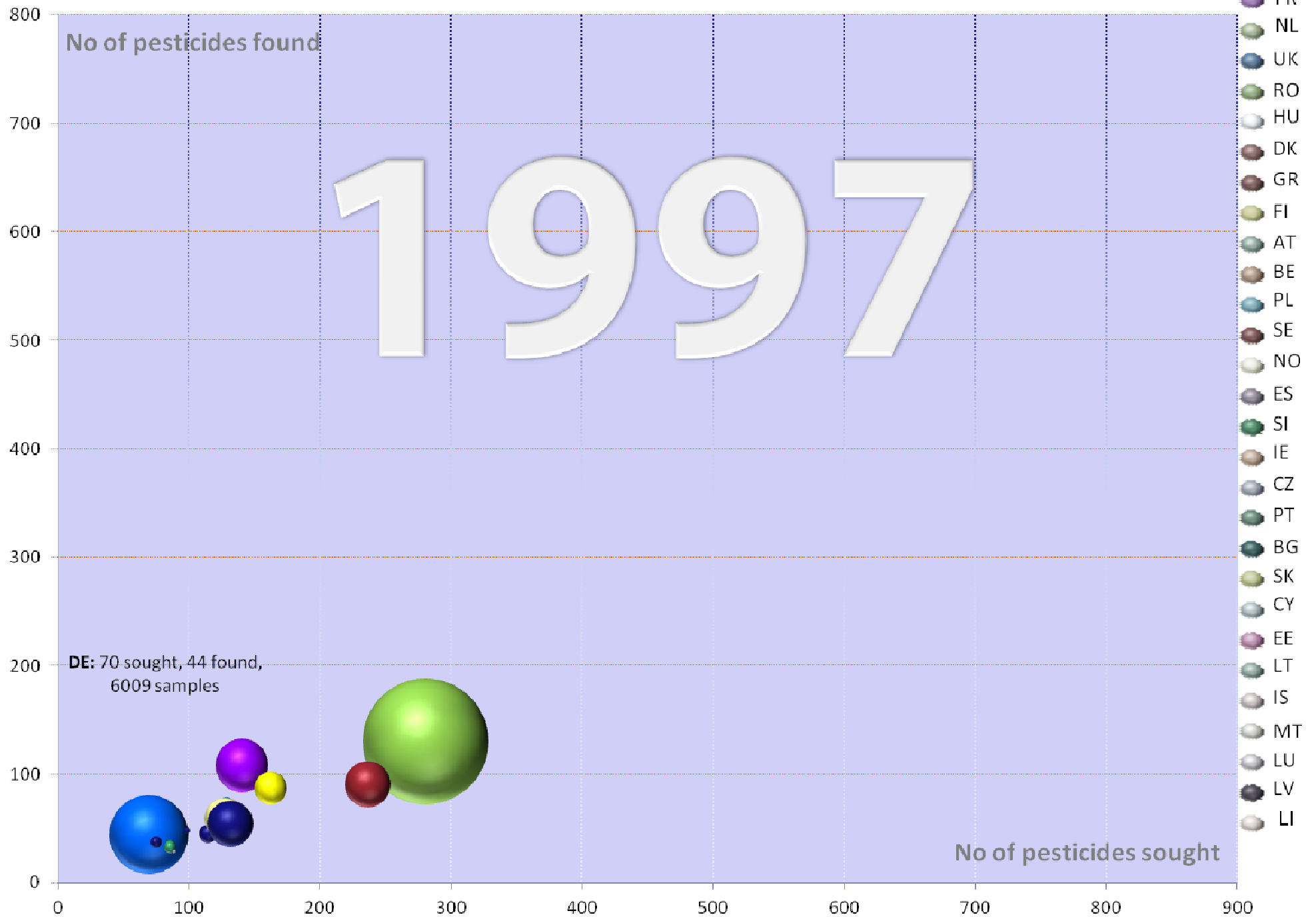
Für jeden Wirkstoff getrennt

Berechnungsmodell aus Zulassungsverfahren

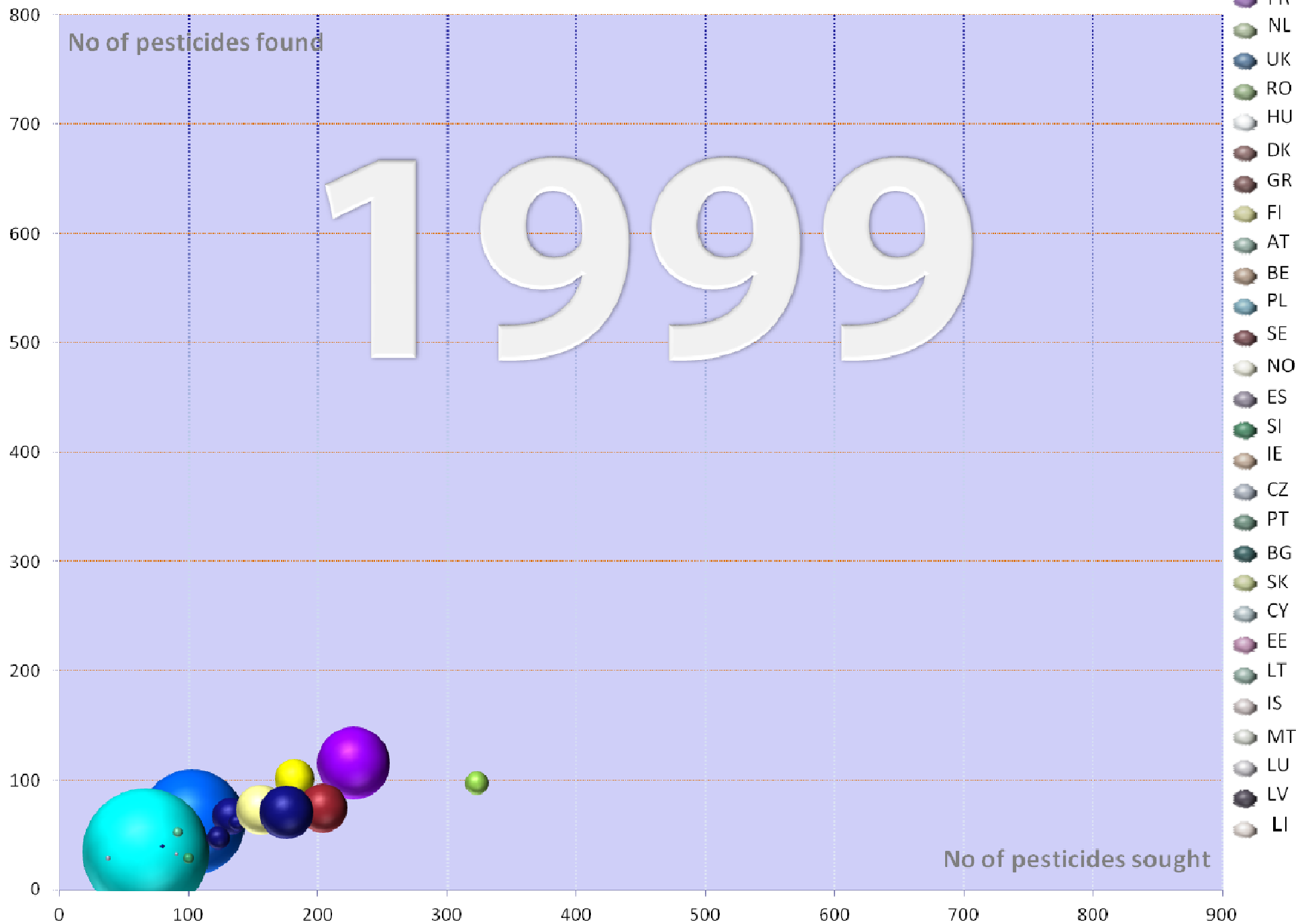
**Kumulative Risikobewertung für alle Wirkstoffe
gemeinsam, die eine additive Wirkung haben
können**

Berechnungsmodell in Entwicklung

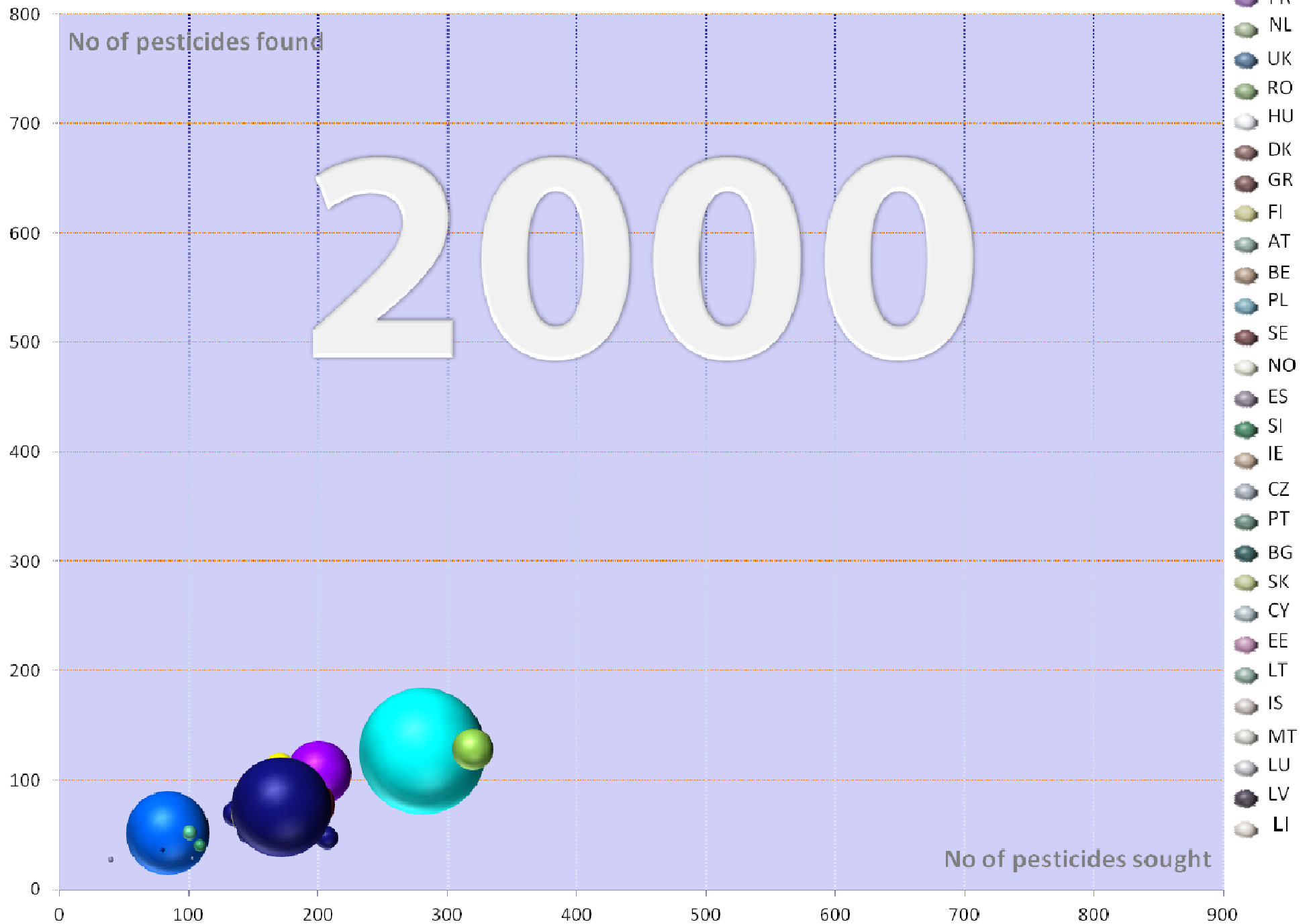
Development of control programs for pesticides in EU



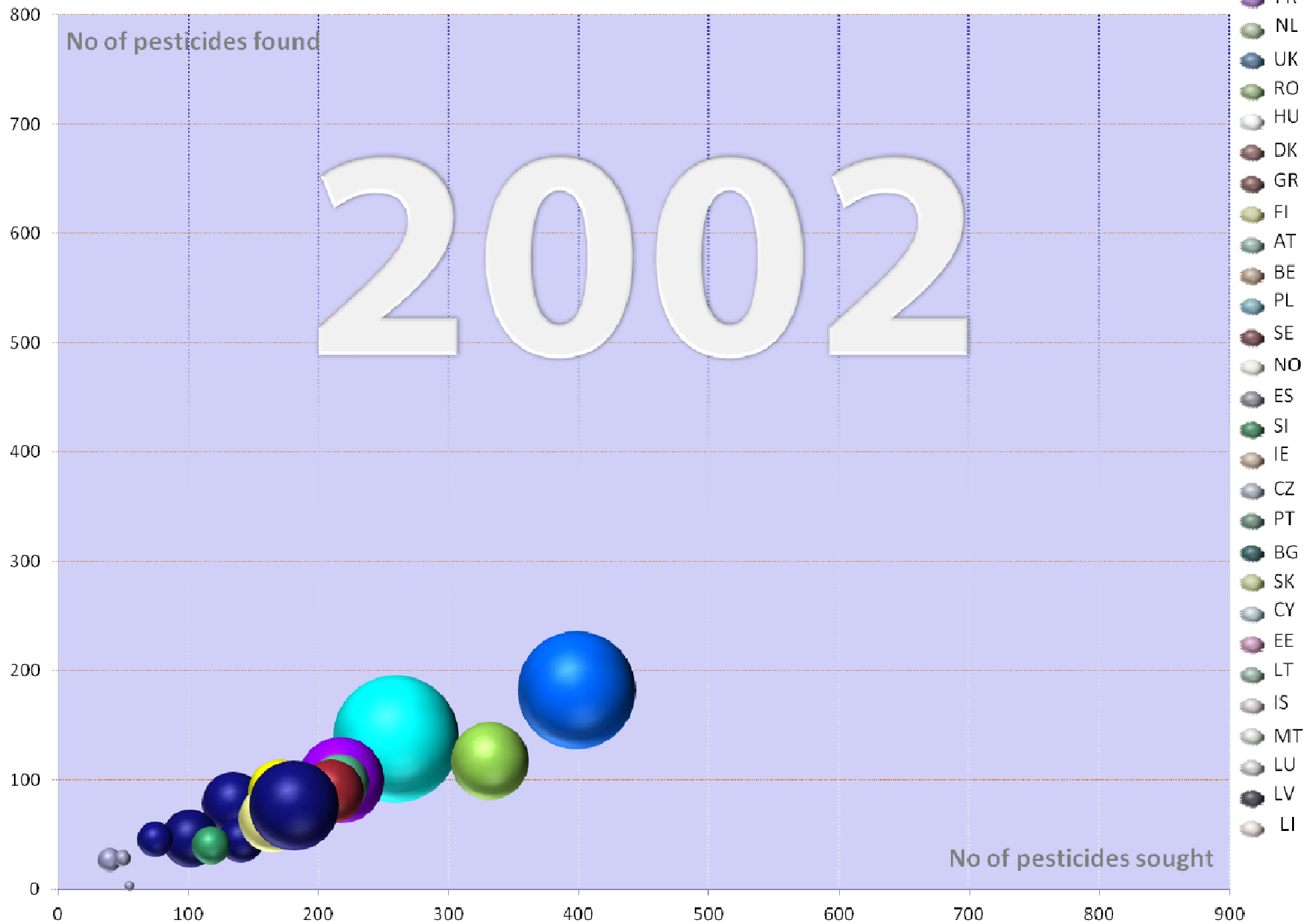
Development of control programs for pesticides in EU



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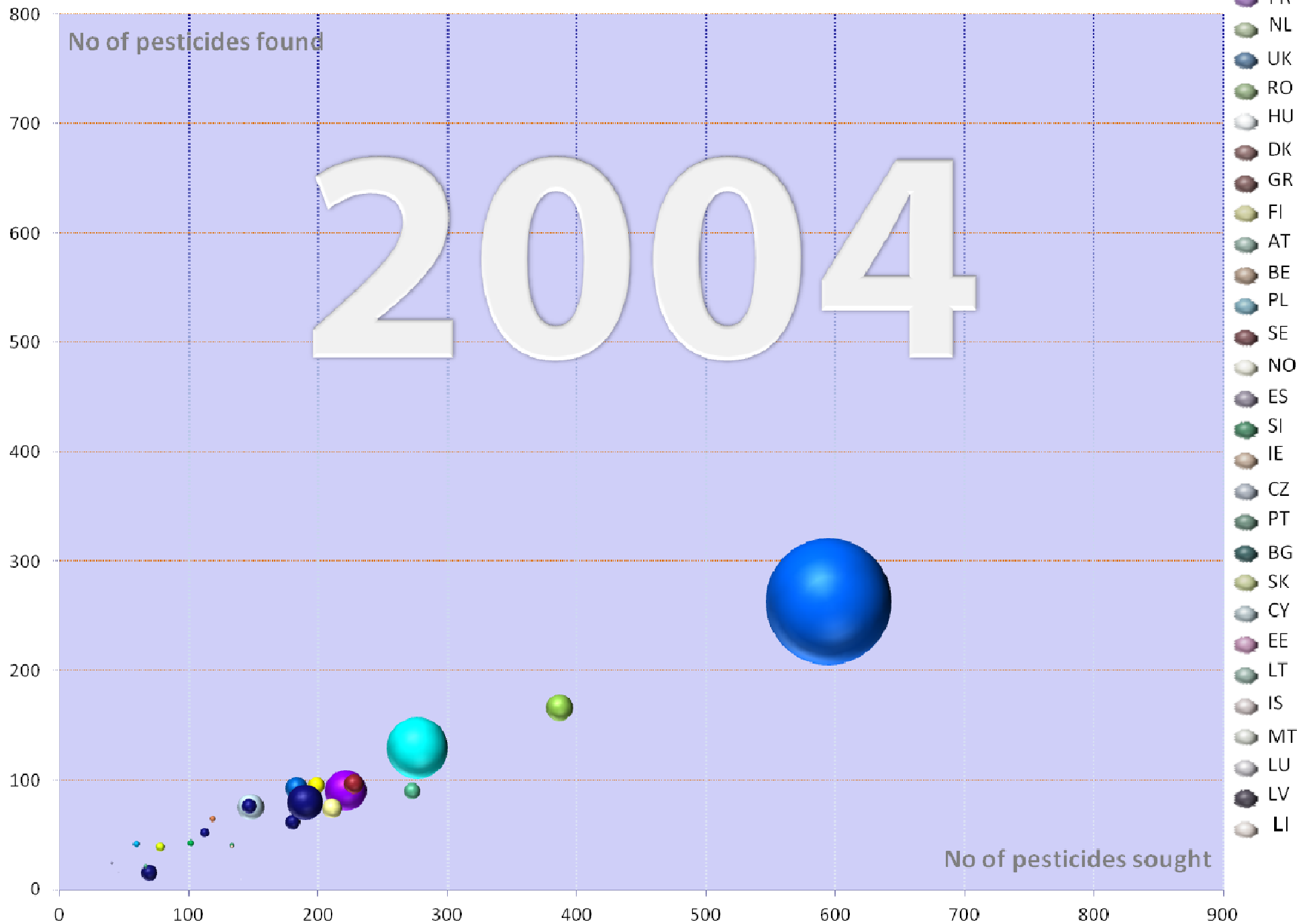
Development of control programs for pesticides in Europe



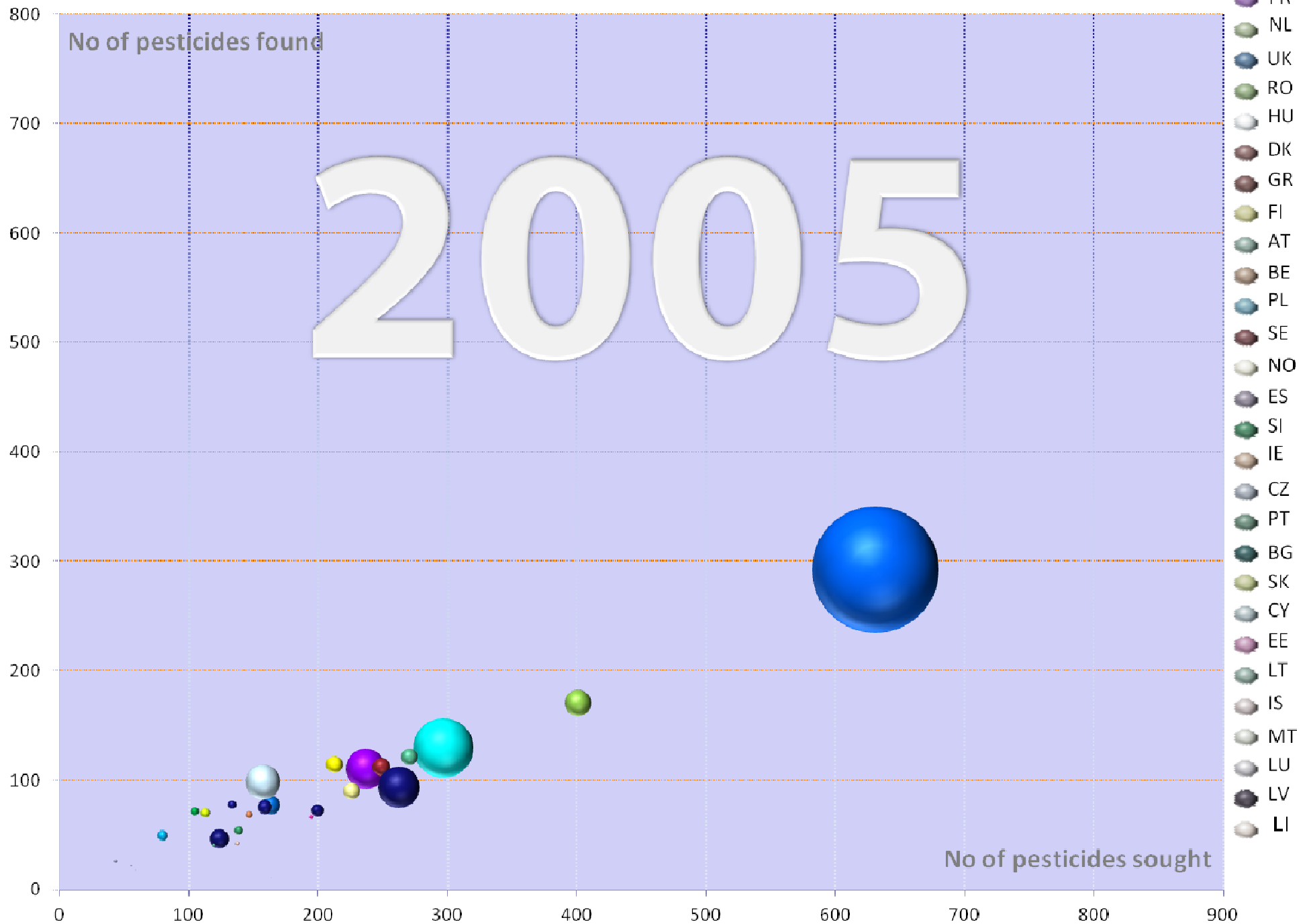
Development of control programs for pesticides in EU



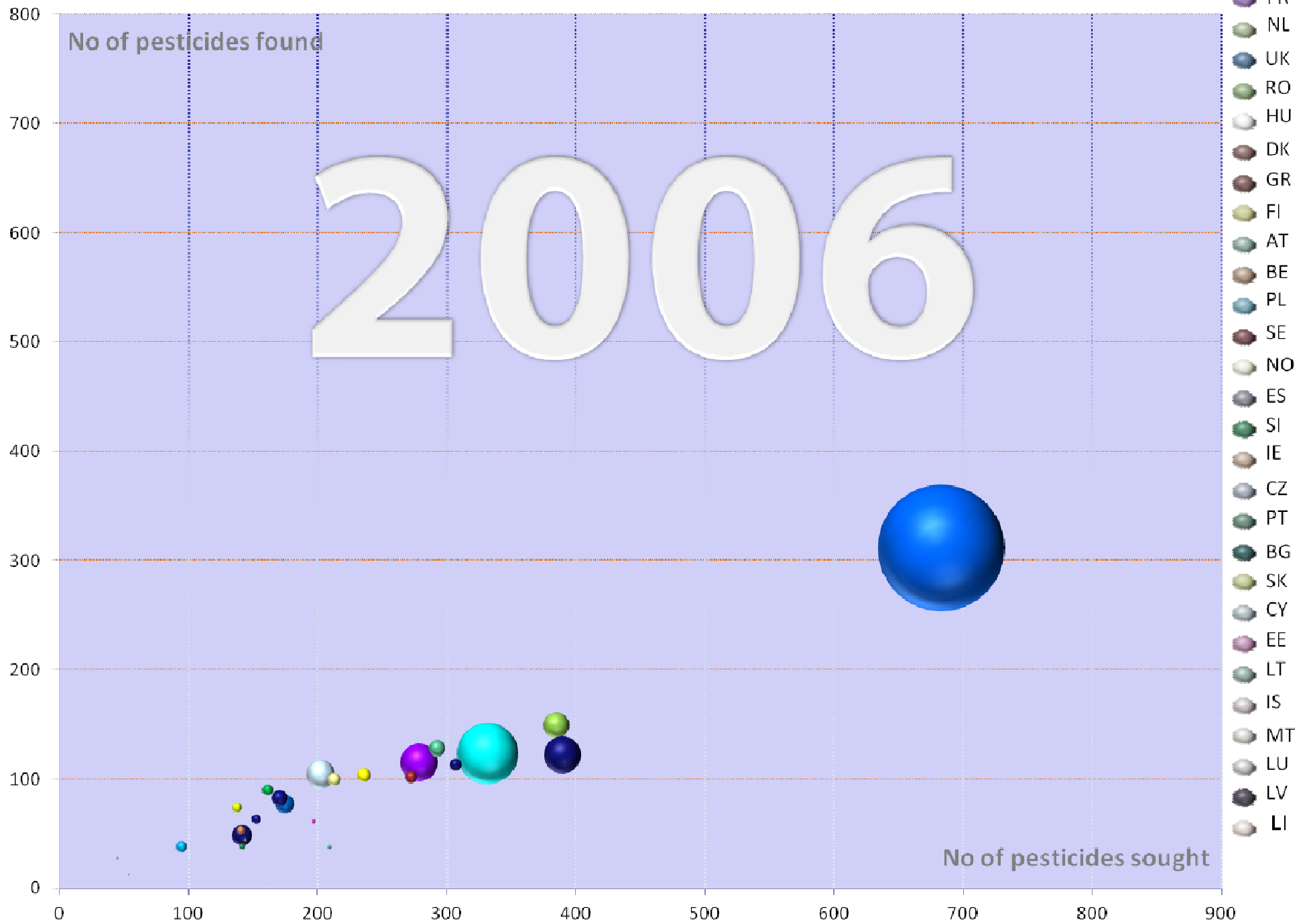
Development of control programs for pesticides in EU



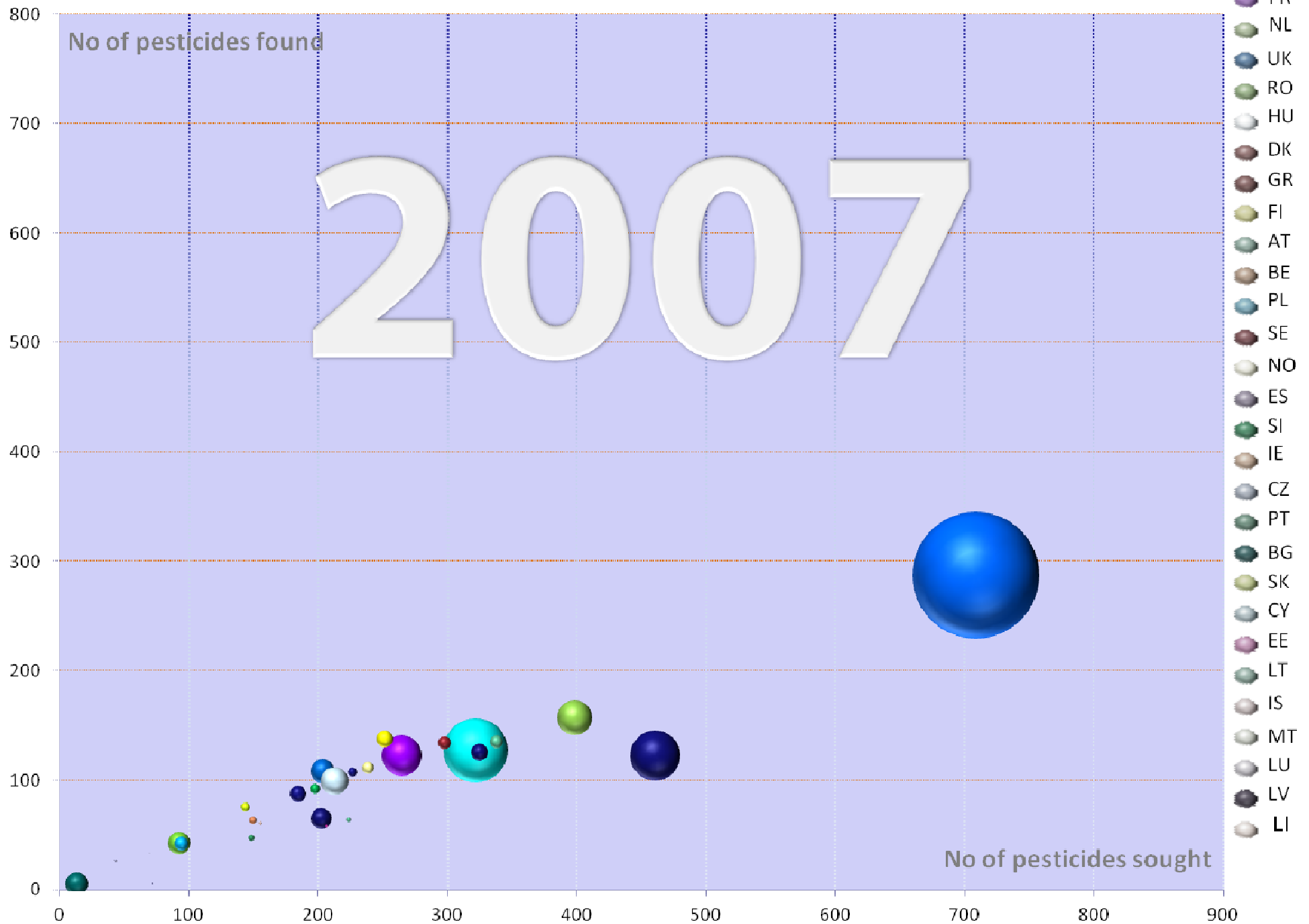
Development of control programs for pesticides in EU



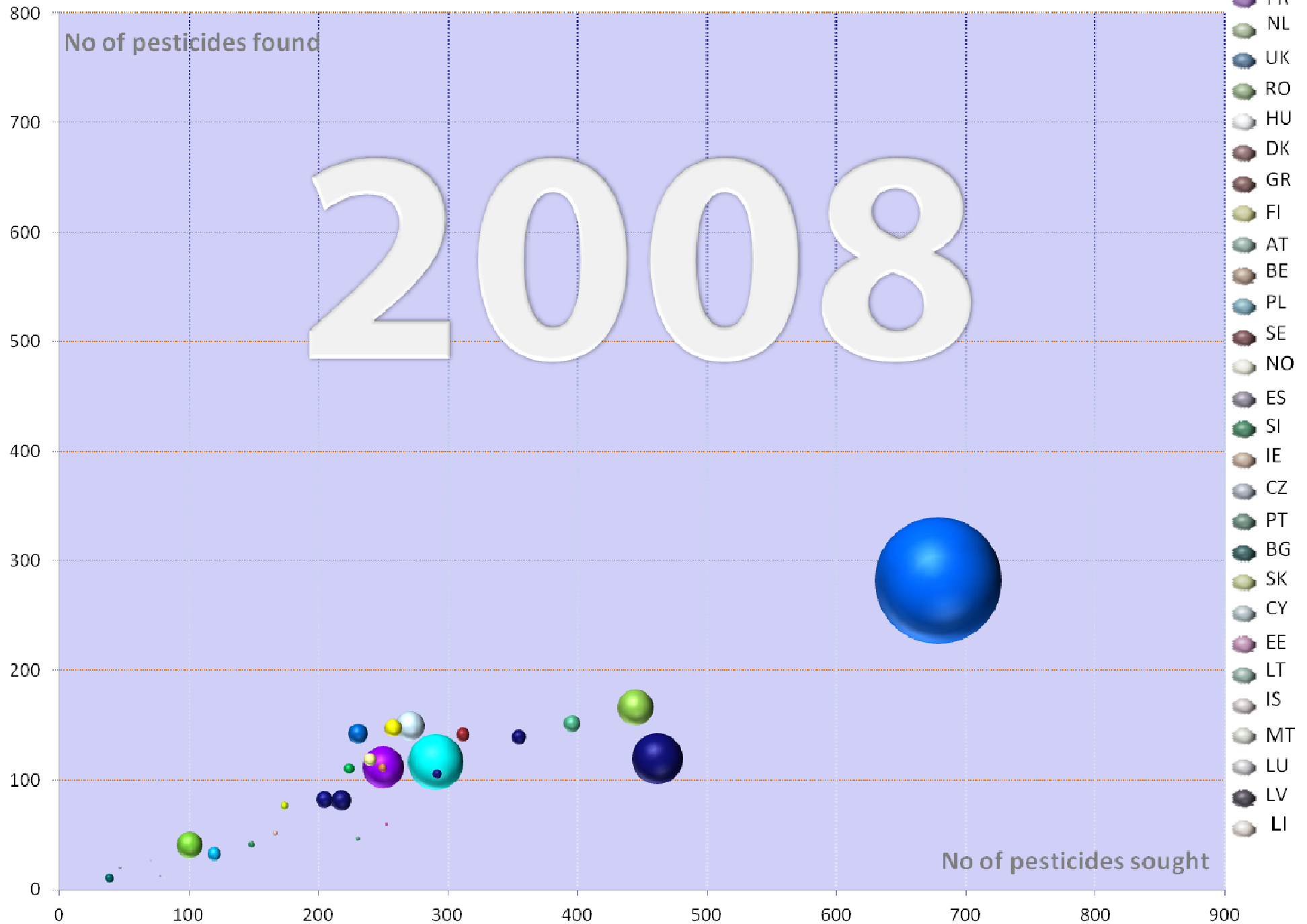
Development of control programs for pesticides in EU



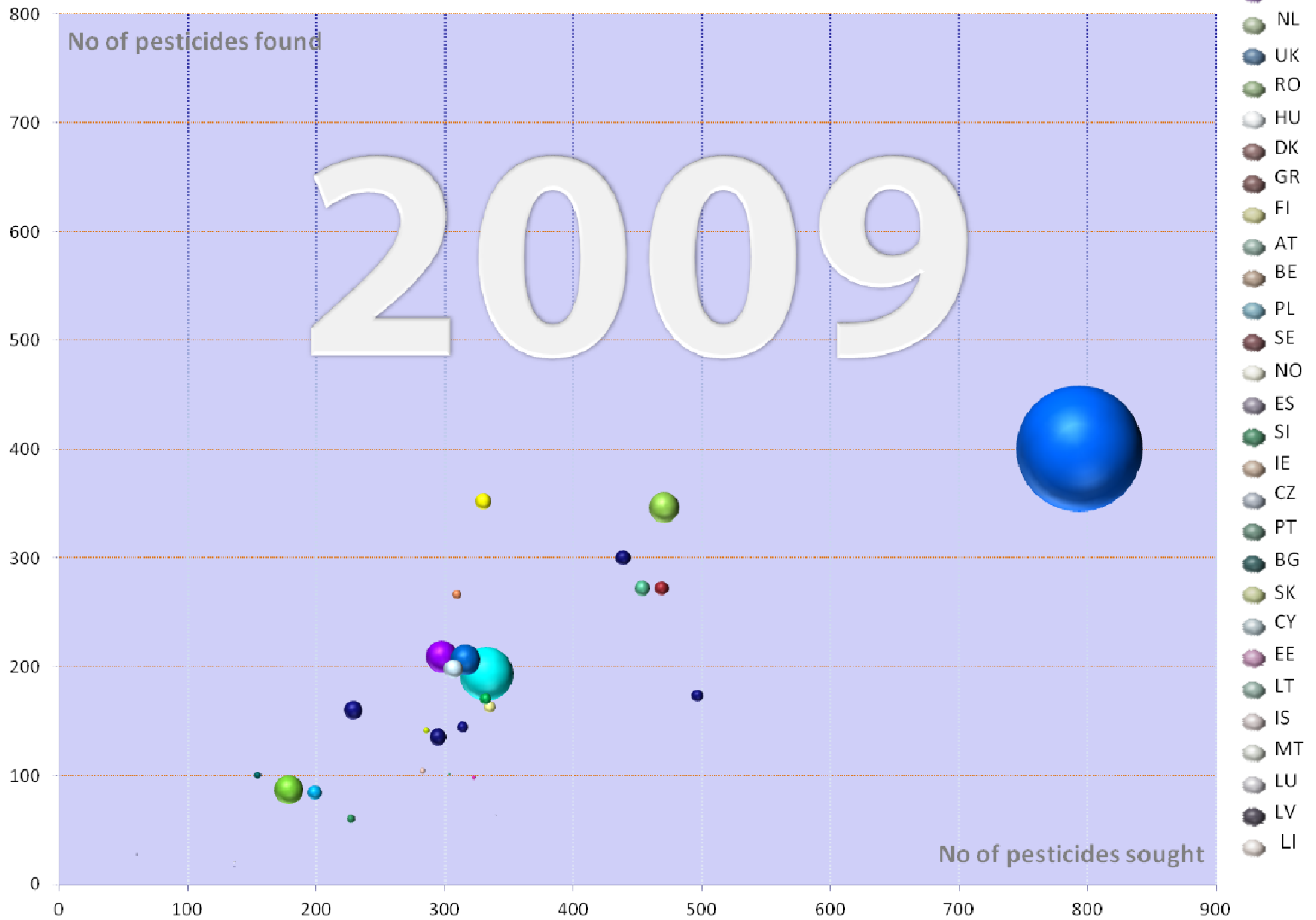
Development of control programs for pesticides in EU



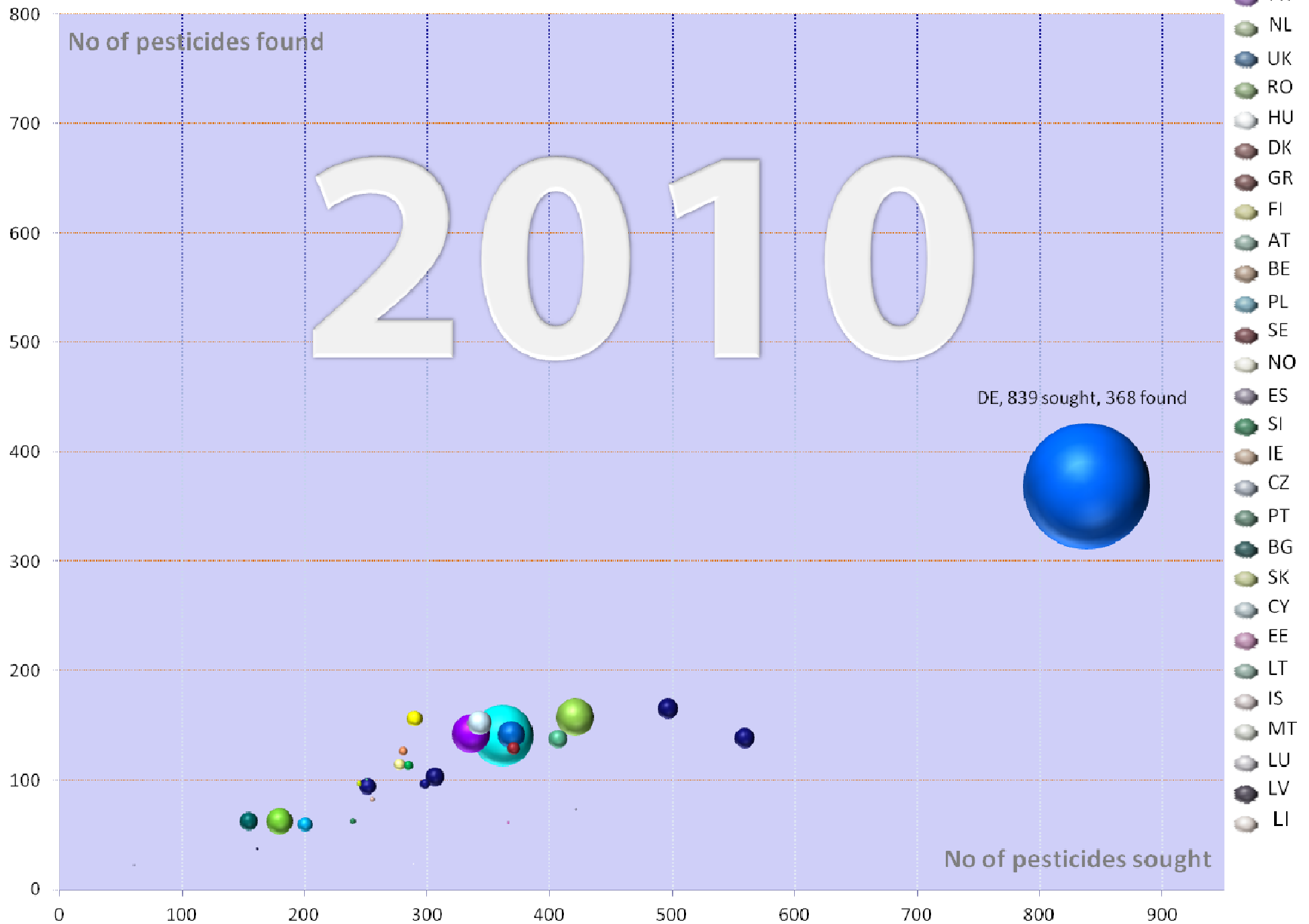
Development of control programs for pesticides in EU



Development of control programs for pesticides in EU



Development of control programs for pesticides in EU



Berechnung der Konsumentenexposition für jeden Wirkstoff
einzeln
Rückstandsdaten für ca. 30 Lebensmittel, die den Großteil der
Verzehrgewohnheiten abdecken

178 Pestizide

Calculation of a **mean residue concentration** for
each pesticide/crop combination

Samples with residues **<LOQ**: mean was calculated
with **numerical value of LOQ**

For each pesticide/crop combination without any
positive result **<LOQ**: were considered as **zero
residue**

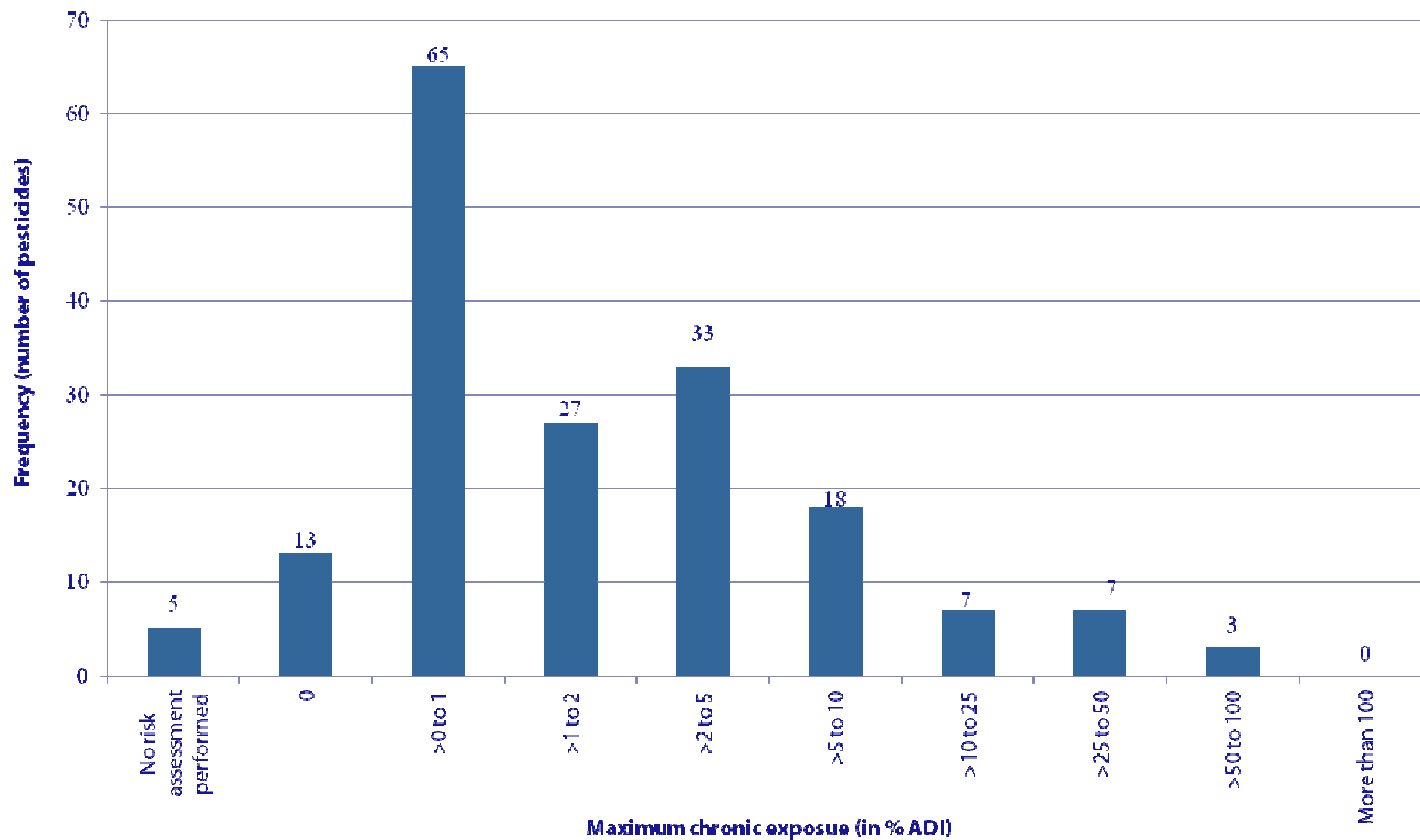
Calculation of the **chronic exposure** using calculation
tool EFSA PRIMo rev. 2

Results of chronic risk assessment – single pesticides

- For 13 pesticides **no quantifiable residues** were reported in any of the crops under consideration (**amitrole, azinphos-ethyl, benfuracarb, campheclor, chlorobenzilate, dichlofluanid, parathion, parathion-methyl, prothioconazole, pyrazophos, quintozene, resmethrin and tecnazene**)
- For **none of the pesticides** covered by the EU-coordinated programme the **estimated exposure exceeded the ADI**.
- For 5 pesticides no toxicological reference value available. No conclusion on consumer risk.

Chronic (long-term) risk assessment

Conclusion: No chronic risk identified for individual substances



What about exposure to different pesticides?



For the first time EFSA performed an indicative **cumulative risk assessment with the results of the monitoring year 2010** to **explore possible** deficiencies of the monitoring data and other limitations which may impede the practical implementation of the methodologies currently under development.

In addition, the **suitability of the simple deterministic tool** for chronic cumulative exposure assessment should be tested.

Since the work on the establishment of common assessment groups (i.e. pesticides which are expected to share the same toxic effects) and on the final methodology is not yet completed, **the results of the exposure assessments are just indicative.**

Cumulative risk assessment – Chronic CRA

In the scenarios selected for the chronic cumulative exposure assessment the overall exposure resulting from **42 organophosphates** and **carbamates** pesticides was calculated.

3 scenarios were calculated:

Scenario 1 (pessimistic scenario): identical with scenario for chronic risk assessment for individual substances – summing up the results of the risk assessment performed for the individual substances without any further modification)

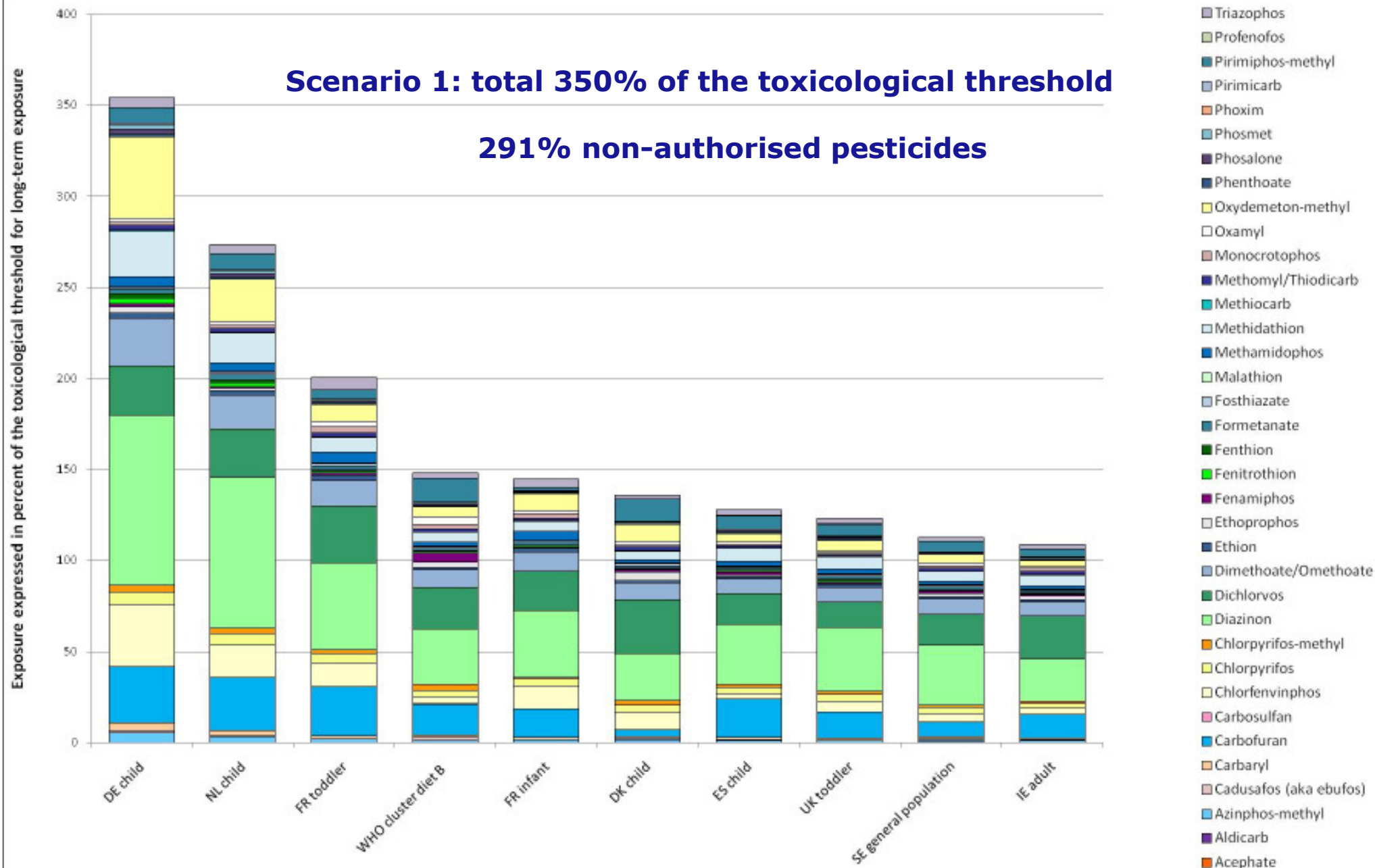
Scenario 2 (refined scenario): replacing the non-detects with zero where the MRL is set at the LOQ.

Scenario 3 (optimistic scenario): All non-detects were assumed as zero-residue.

Cumulative risk assessment – Chronic CRA

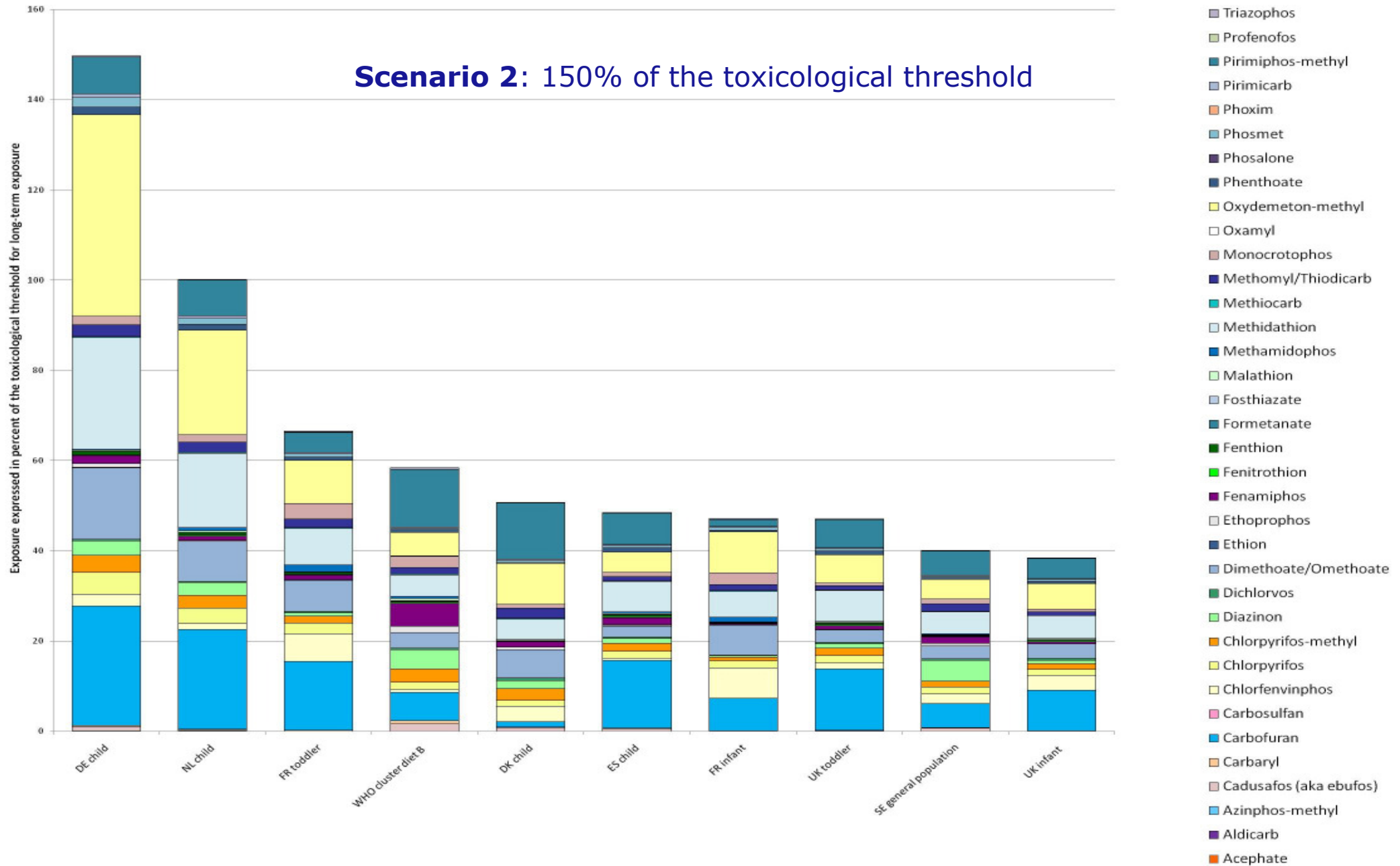
Scenario 1: total 350% of the toxicological threshold

291% non-authorized pesticides

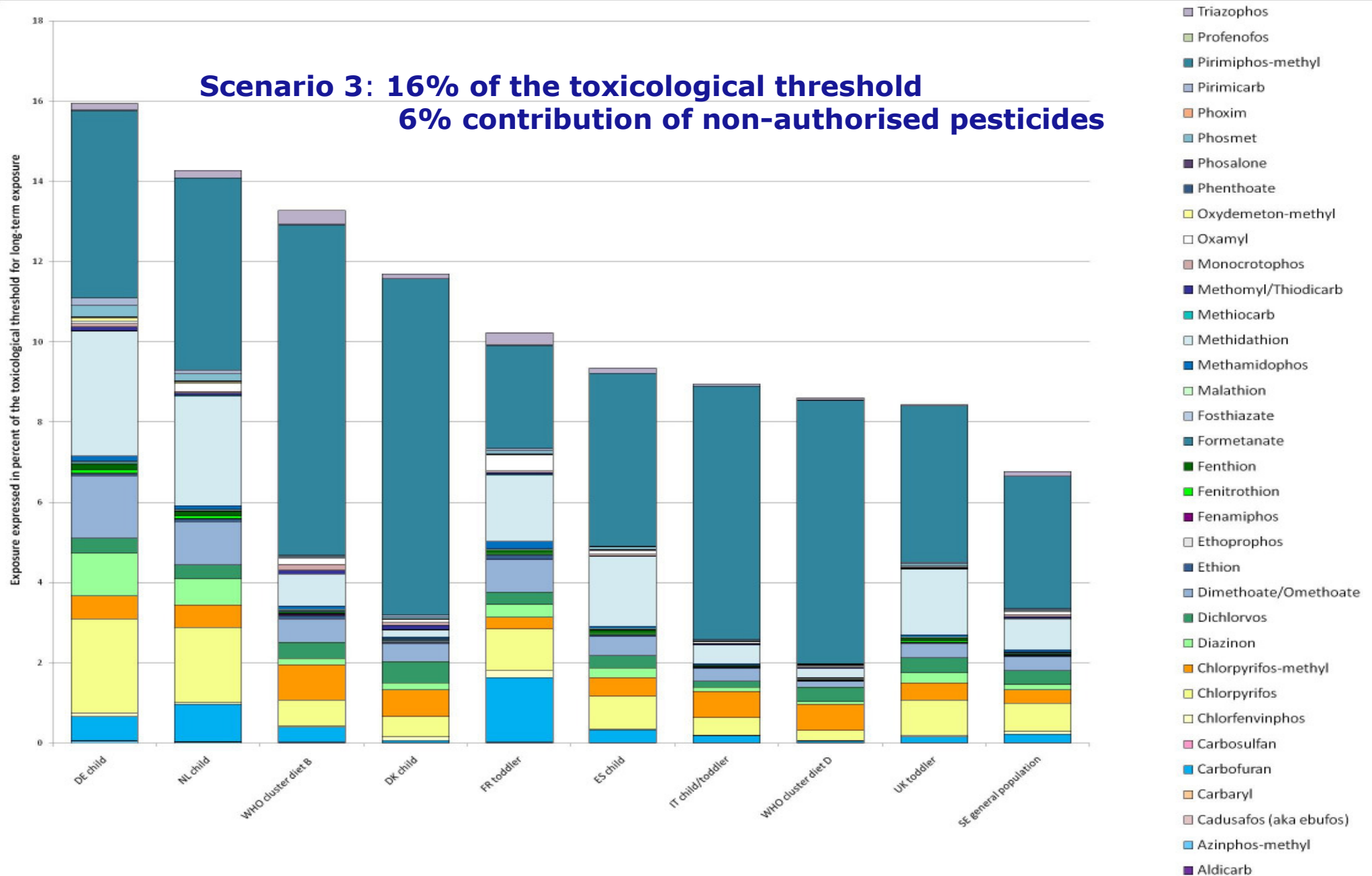


Cumulative risk assessment – Chronic CRA

Scenario 2: 150% of the toxicological threshold



Cumulative risk assessment – Chronic CRA



Chronic cumulative risk assessment - conclusions

The first attempt to perform **cumulative exposure assessment** carried out with the 2010 pesticide monitoring data highlighted that the available monitoring data have some limitations, mainly linked to the **high number of non-detects** which are biasing the exposure calculations if no suitable options for refining the calculations are implemented.

Possible solutions:

- Get more information on authorisations of pesticides for the crops under consideration (**EU central pesticide register**) and actual use of pesticides on the crops under consideration (**% crop treated**)
- Improve the analytical methods to **achieve lower LOQs**
- Report if samples contained detectable residues below the LOQ (**>LOD**)
- Explore further the possibility to use a deterministic tool for chronic cumulative risk assessment by comparing the results with results derived with probabilistic tools.
- Further refinements of intake calculations for processing and peeling should be implemented.

Acute (short-term) risk assessment

12 food commodities covered by EU coordinated programme 2010



18.243 samples

Calculation of a **threshold residue concentration** for each pesticide/crop combination

For each pesticide/crop combination: **Number of samples exceeding the threshold concentration**

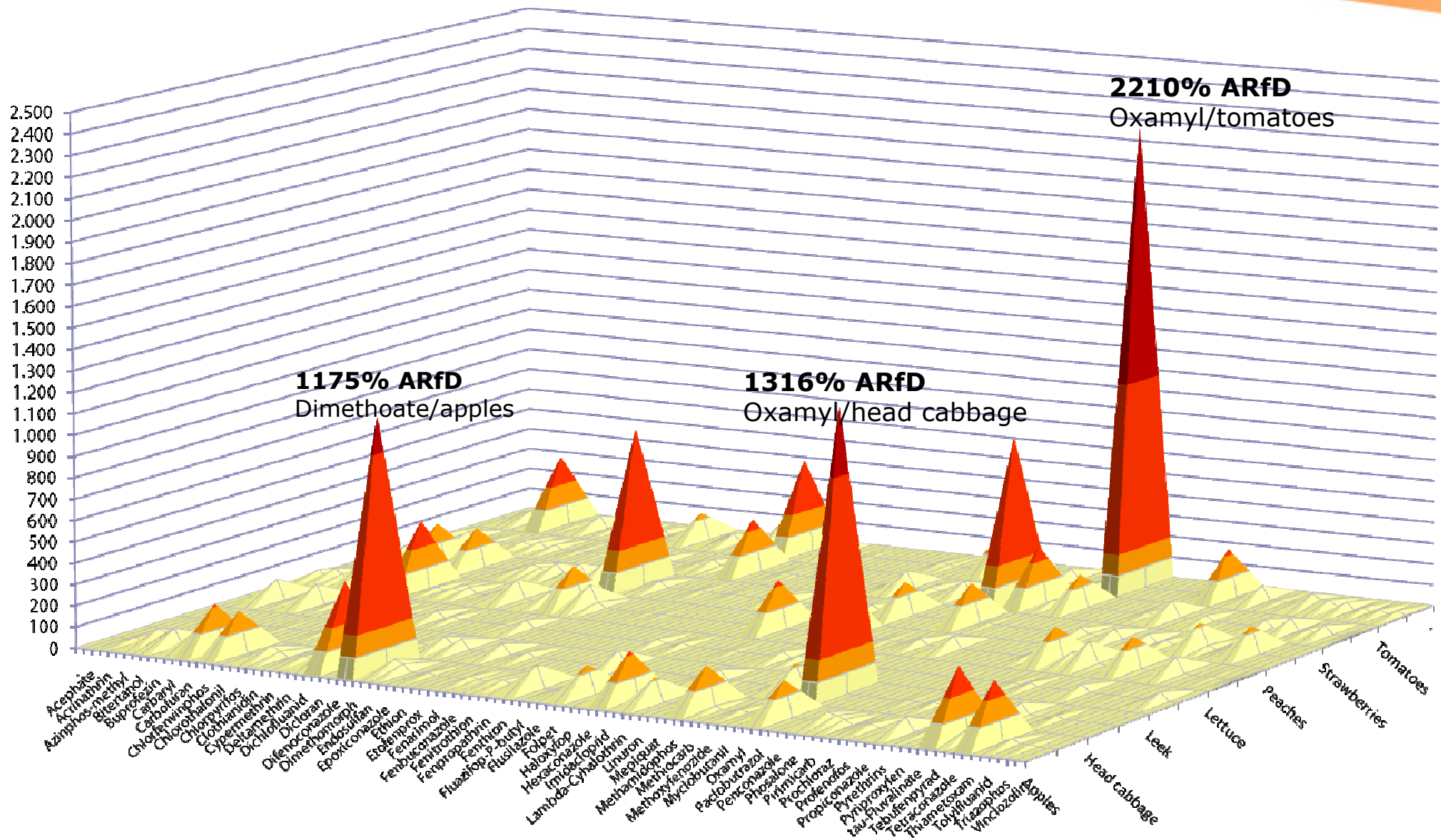
Highest residue measured (HRM)

Calculation of the **acute exposure** using PRIMo rev. 2

132 pesticides/residue definitions for which ARfD was available (alternatively ADI values were used)

- For **20 pesticides** the dietary exposure was negligible (**aldrin and dielrin, befuracarb, bromuconazole, cadusafos, carbosulfan, chlordane, chlorbenzilate, dinocap, fipronil, fosthiazate, metconazole, methoxychlor, parathion, phenthoate, phoxim, prothioconazole, pyrazophos, resmethrin, tecnazene and triticonazole**).
- The commodities for which no risk was identified were **milk, oats, rye and swine meat**.

Acute (short-term) risk assessment



A potential acute risk could not be excluded for **79 samples out of 18.243 samples.**

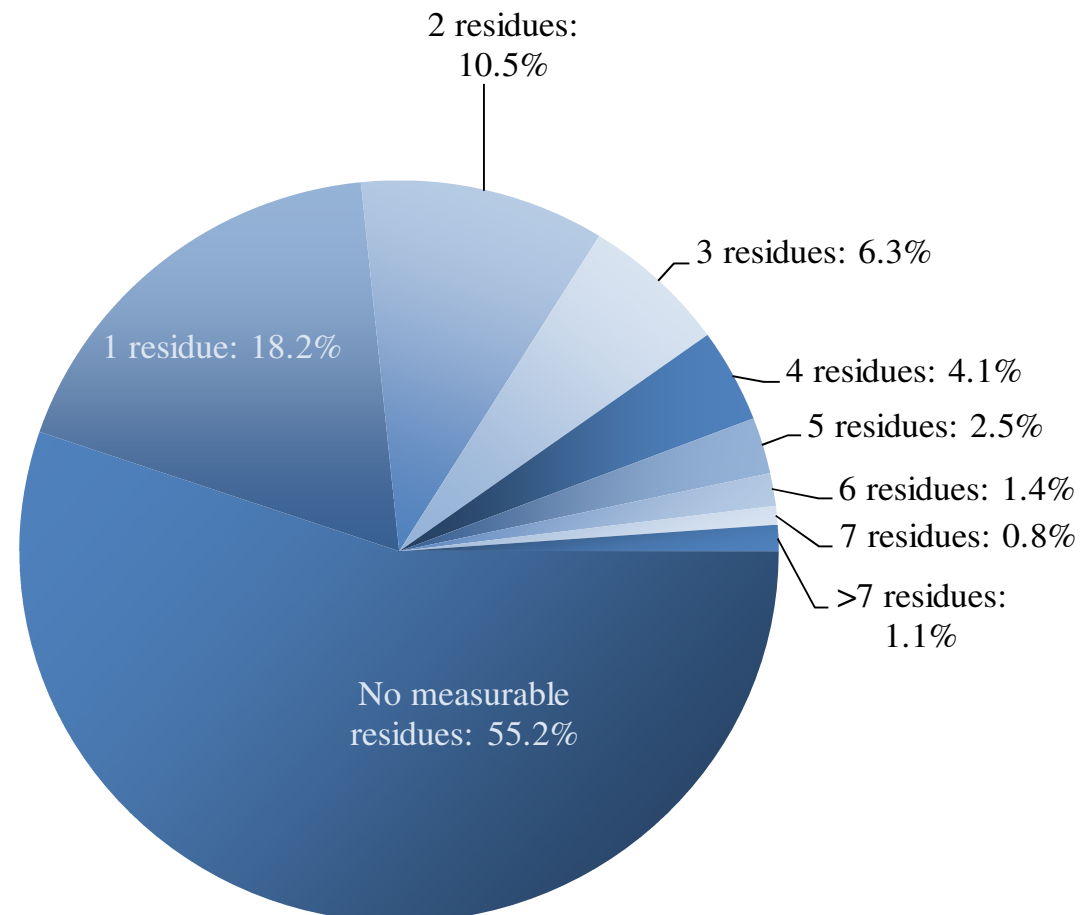
Assumptions for the acute exposure calculation:

Food containing high residues was consumed in high amounts, without any washing, peeling or other processing like cooking which would remove or reduce the residues in the food. In addition, a potential inhomogeneous distribution of residues on the individual units analysed in the composite sample was assumed.

But what about acute cumulative exposure resulting from multiple residues present on the same sample?

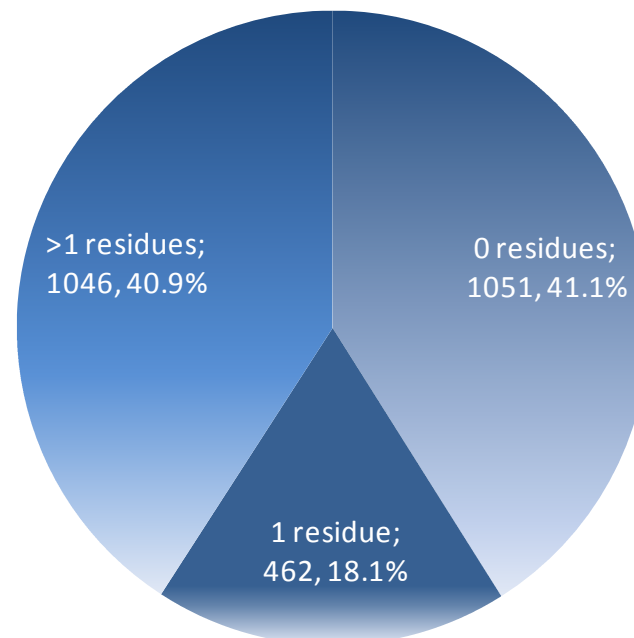
2010 Monitoringergebnisse:

In **55,2 %** of the samples no measurable residues reported,
in **18.2 %** one pesticide found
in **26.7%** of samples more than one residue was found.

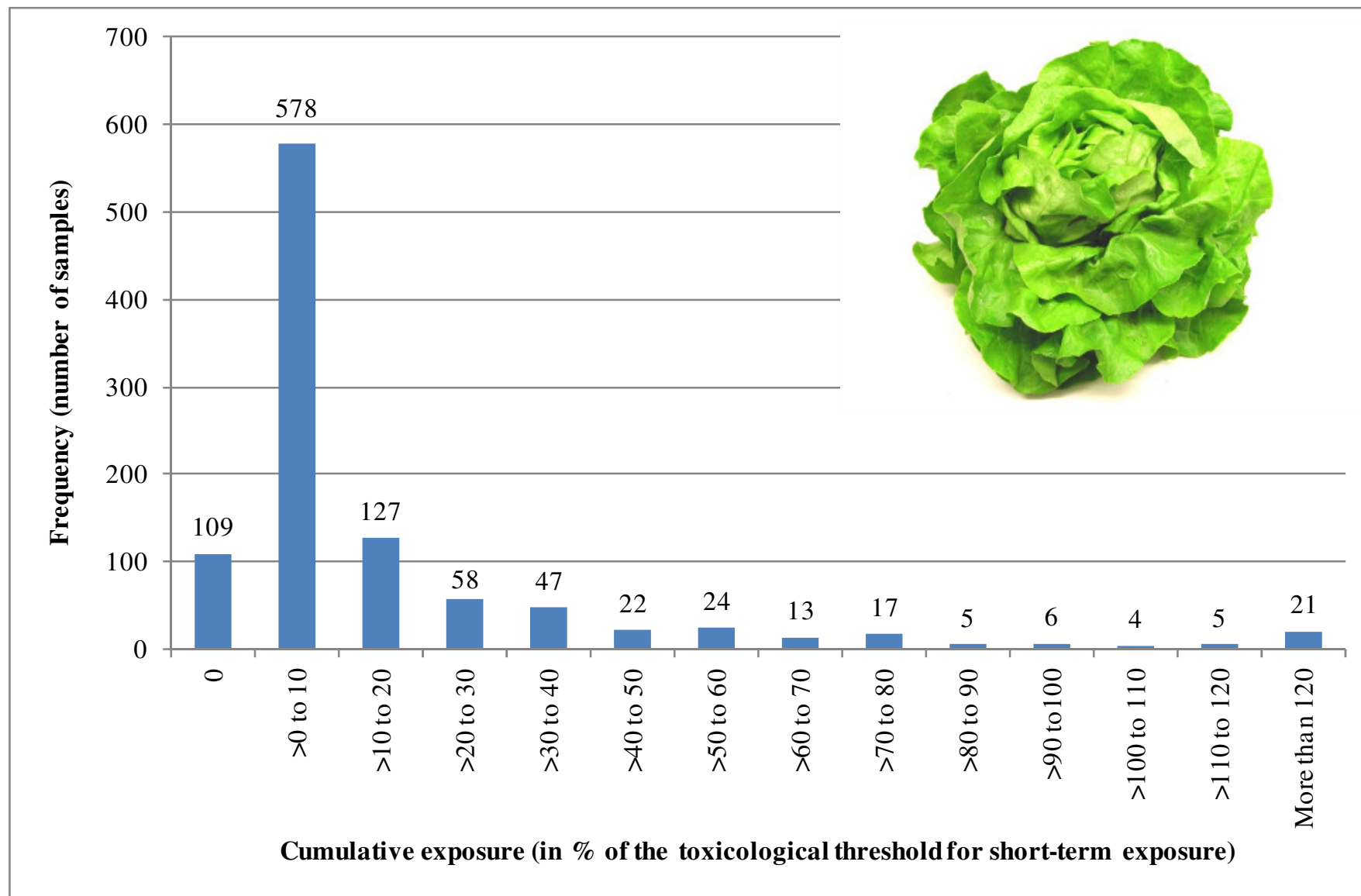


The scenario to assess **acute** cumulative exposure focussed on lettuce, containing **multiple residues (1041 samples)**.

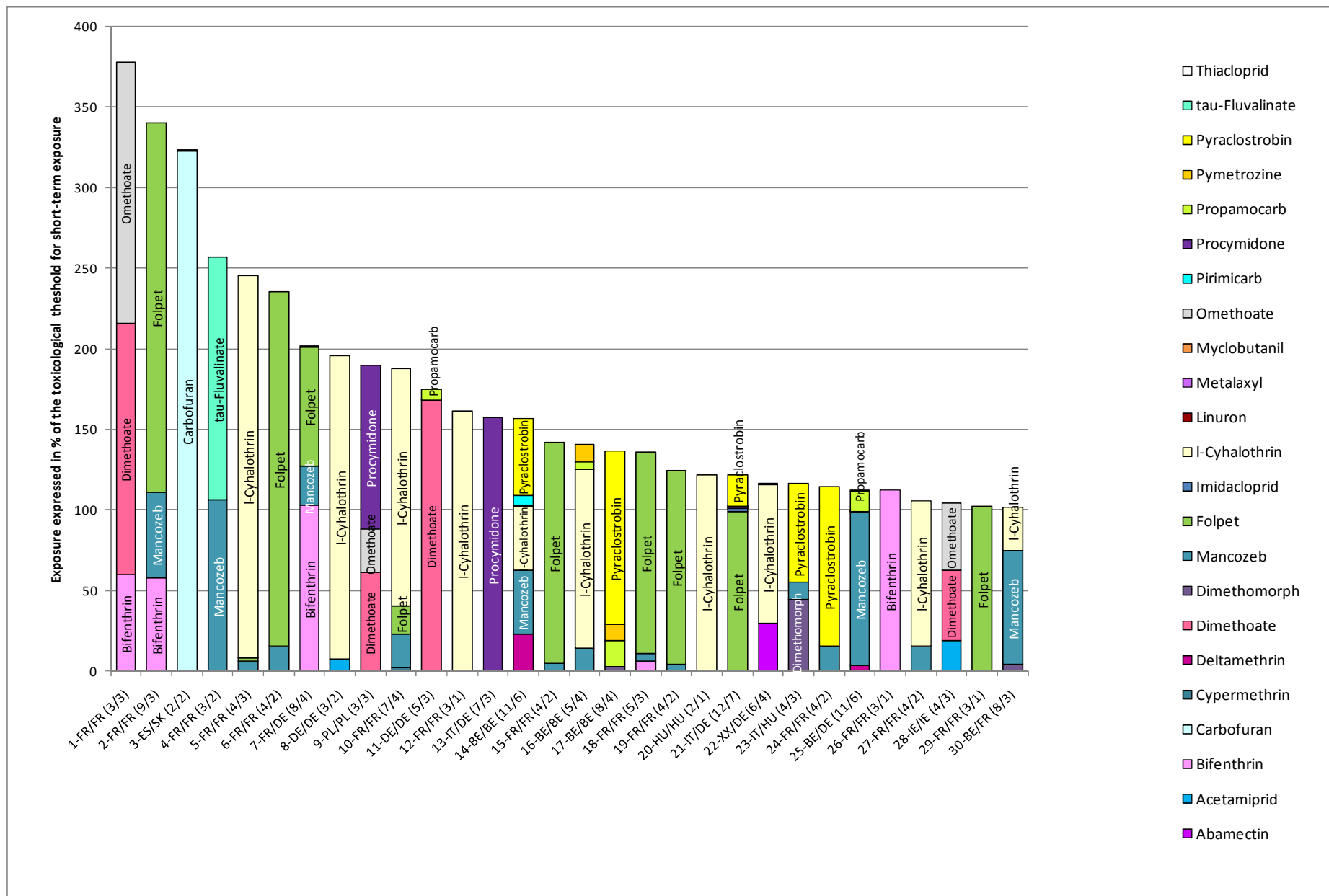
The exposure resulting from the individual compounds present on a single sample was summed up. The toxicological potency of the individual pesticide was derived from its ARfD, respectively.



Cumulative risk assessment – acute CRA



Cumulative risk assessment – acute CRA



Reasons for multiple-residues in food

- Application of different pesticides on the same crop
- Mixing of lots with different treatments for analytical samples
- Metabolism in crops converts one pesticide to another pesticide (e.g. dimethoate/omethoate)
- Contaminations during handling, storage, transport or packing of products
- Spray drift
- Persistent residues in soil
- Strategies to comply with secondary trade standards



toxicological equivalent factors

Common Assessment Groups

Consumption data

methodology for acute and chronic exposure calculation

Monitoring data



**Vielen Dank für Ihre
Aufmerksamkeit**

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