

***Unavoidable pesticide
contaminations***

Blockbuster Herbicides

Dr. Günter Lach – Lach & Bruns Partnerschaft

BLOCKBUSTER HERBICIDES

lach : bruns

Glyphosate

- **Commercial introduction: 1974 (Monsanto), thus > 40 years of applications worldwide**
- **Uses: Control of annual and perennial grasses [...] pre-harvest, in cereals, peas, beans, oilseed rape, flax and mustard, [...] control of [...] broad-leaved weeds in stubble and post-planting/pre-emergence [...] in vines and olives, [...]; in orchards, pasture, forestry and industrial weed control, at up to 4.3 kg/ha.**



source: The Pesticide Manual, BCPC

<http://hangzhoukaron.en.made-in-china.com/product/uBSnhaZTEqVN/China-Glyphosate-95-Tc-41SL-62SL.html>

BLOCKBUSTER HERBICIDES

lach : bruns



Paraquat

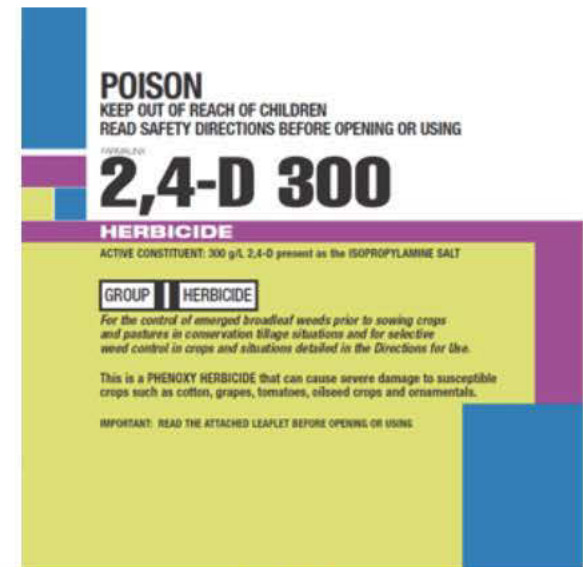
- **Commercial introduction: 1962** (ICI, now Syngenta), thus **> 50 years** of applications worldwide
- **Uses:** Broad-spectrum control of broad-leaved weeds and grasses [...]. Also used for general weed control on non-crop land [...] as a **desiccant** for pineapples, sugar cane, soya beans and sunflowers; and in **pasture renovation**. For control of annual weeds, applied at **0.4–1.0 kg ion/ha**.

source: The Pesticide Manual, BCPC

BLOCKBUSTER HERBICIDES

2,4-D

- **Commercial introduction: 1942,**
thus \approx 75 years of applications worldwide
- **Uses: Post-emergence control of annual and perennial broad-leaved weeds** in cereals, maize, sorghum, grassland, established turf, grass seed crops, orchards (pome fruit and stone fruit) [...], and on non-crop land (including areas adjacent to water), at **0.28–2.3 kg/ha**. **Control of broad-leaved aquatic weeds.**



source: The Pesticide Manual, BCPC

BLOCKBUSTER HERBICIDES

lach : bruns

Pendimethalin



- **Commercial introduction: 1974** (American Cyanamid, now BASF), thus **40 years** of applications worldwide
- **Uses:** Control of most **annual grasses** and many annual broad-leaved weeds, at **0.6–2.4 kg/ha**, in **cereals**, onions, [...], **maize**, rice, **soya beans**, [...], **potatoes**, **cotton**, hops, pome fruit, stone fruit, berry fruit (including strawberries), citrus fruit, lettuce, [...].

So BLOCKBUSTER HERBICIDES are used in particular for MAJOR CROPS (thus major field applications) !

source: The Pesticide Manual, BCPC

BLOCKBUSTER HERBICIDES

Current situation of organic agriculture:

Natural environment is not “natural” anymore!

This is a consequence of

- ***Decades-long and continuing global use of pesticides and in particular herbicides***



BLOCKBUSTER HERBICIDES

Examples of an unavoidable impact of organic agriculture products by pesticides:

- **Endosulfan (Brazil):** Contamination of soy beans medium level (2009/10): **0,05 mg/kg**
- **Glyphosate (Canada/USA):** Contamination of wheat medium level (2014): **0,035 mg/kg**



BLOCKBUSTER HERBICIDES

lach : bruns





BLOCKBUSTER HERBICIDES

Glyphosate (Canada 2015):

Contamination of Mustard, level at ca. 0,046 mg/kg

Statement of the responsible Canadian Control Body:

1. *On completion of our investigation ... **no evidence** of direct application ... or commingling **has been found**.*
2. *Levels of pesticides at 0,046 mg/kg are at or below **background levels** in intensively farmed areas. These levels are often found in untreated plants due to pesticide drift (**air transport**) from treated areas often **distant from untreated (organic) areas**.*

BLOCKBUSTER HERBICIDES

Examples of an unavoidable impact of organic agriculture products by pesticides:

Paraquat (South America, 2015):
Contamination of **Chia** seed



ca. **32%** (291 out of 910 samples) of each conv. and organic Chia seed samples show **levels above 0,01 mg/kg**, while ca. 40% of these samples exceed the EU-MRL of 0,02 mg/kg! *

** source: Analytica Alimentaria GmbH, Kleinmachnow (Germany)*



BLOCKBUSTER HERBICIDES

Examples of an unavoidable impact of organic agriculture products by pesticides:

Prosulfocarb and Pendimethalin (Germany, 2014):

- *The results ... show for both herbicides, Pendimethalin and Prosulfocarb, a **clear contamination of the region extending beyond single locations.***
- *The data situation from our own and other examinations permit the unanimous conclusion of an **undesired wide-spread and continuing dissemination in the environment ...***

source: http://www.bioland.de/fileadmin/dateien/HP_Dokumente/Pressemitteilungen/LUGV_BB-Studie_Ferntransport_Pestizide.pdf

BLOCKBUSTER HERBICIDES

lach : bruns



Analytical approach:

- **Single Residue Methods**
resp. specific Multi-Methods!

„POLAR“ QUECHERS-METHOD (QuPPE)

covers f.ex. Glyphosate, Paraquat, 2,4-D, etc.

But:

**Different analytical modules have to be applied
depending on the molecules to be analysed!**

BLOCKBUSTER HERBICIDES

Analytical approach

- **Huge challenge to establish robust methods:
Reporting limit of 0,01 mg/kg often not possible**
- **Reasons: less experiences with single residue
methods; often difficult matrices like oil seeds
cereals, etc.**
- **Methods are not yet standardised / harmonised**
- **Several methods are know, but all are with tricky
aspects; technical skill of the analyst is most
important**





BLOCKBUSTER HERBICIDES

proof : acs

lach : bruns

Facing analytical quality.

relana®

Ring Test
„Glyphosate in flax seeds“
P1304-RT

Summary



Performance Test

with

“Undercover Samples”

Analysis of pesticide residues
and paraquat in chia seeds
on a routine level



August 2015



BLOCKBUSTER HERBICIDES

More open questions:

Contaminations are not equally distributed across a field / a lot !

- ➔ *How to take samples?*
- ➔ *How to identify “hot spots”?*
- ➔ *What does a test result tells you about the total lot behind?*