Reducing emission of pesticides to the environment in Dutch agriculture

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7th June 2011 – Randwijk – The Netherlands

APPLIED PLANT RESEARCH
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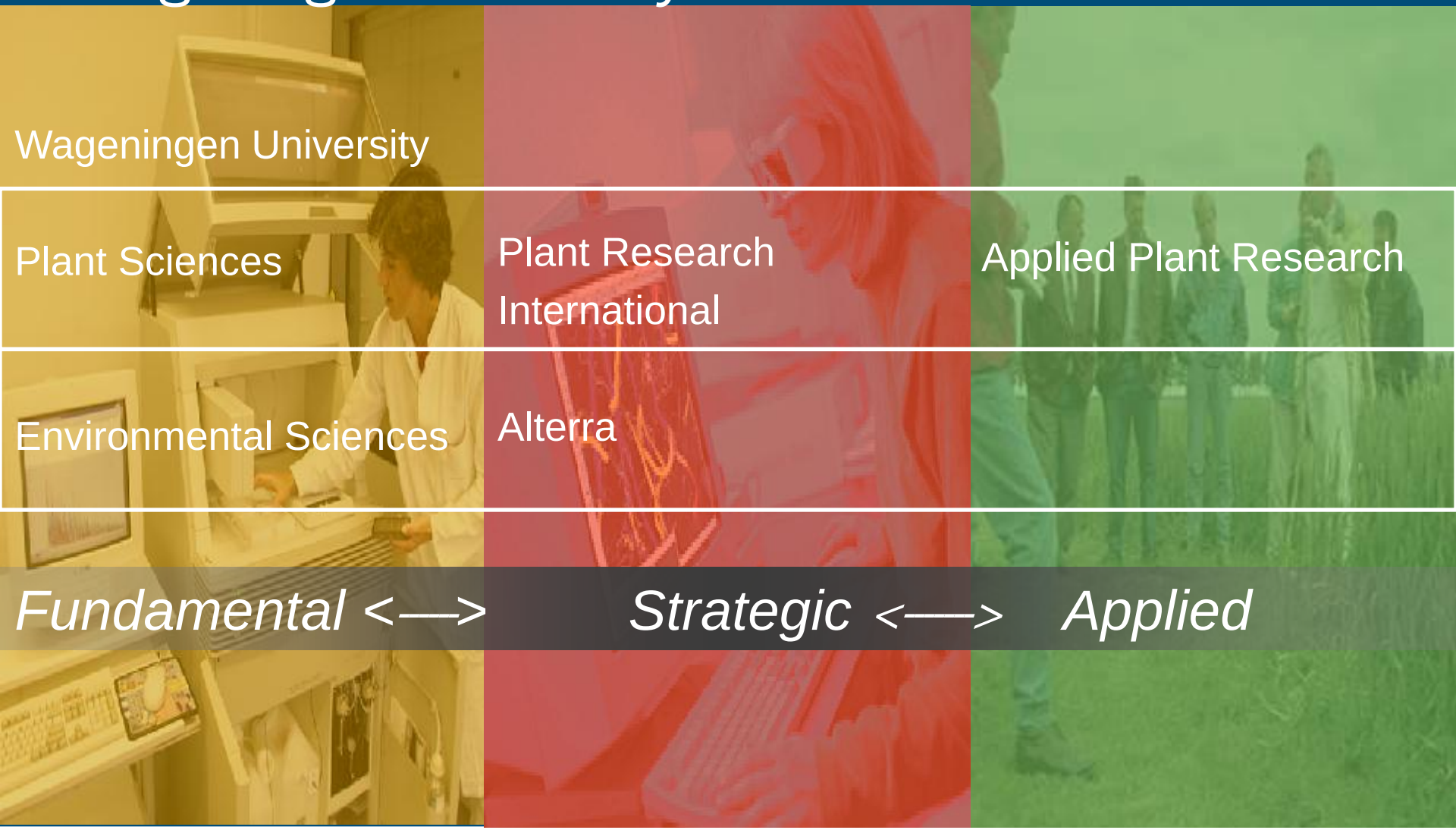

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For quality of life

Set up of this part

- Pesticides and surface water in the Netherlands
- Diffuse emissions
  - Risks
  - Solutions
- Point sources
  - Risks
  - Solution
- Demonstration

Why prevent emission?

- Improving or maintain water quality
  - Healthy aquatic system
  - Production of safe drinking water

- Prevent loss of plant protection products (PPP's)
  - European Water Framework Directive connects water quality to PPP admitance

Oppervlaktewateren

Bron: Topografische Dienst Kadaster.

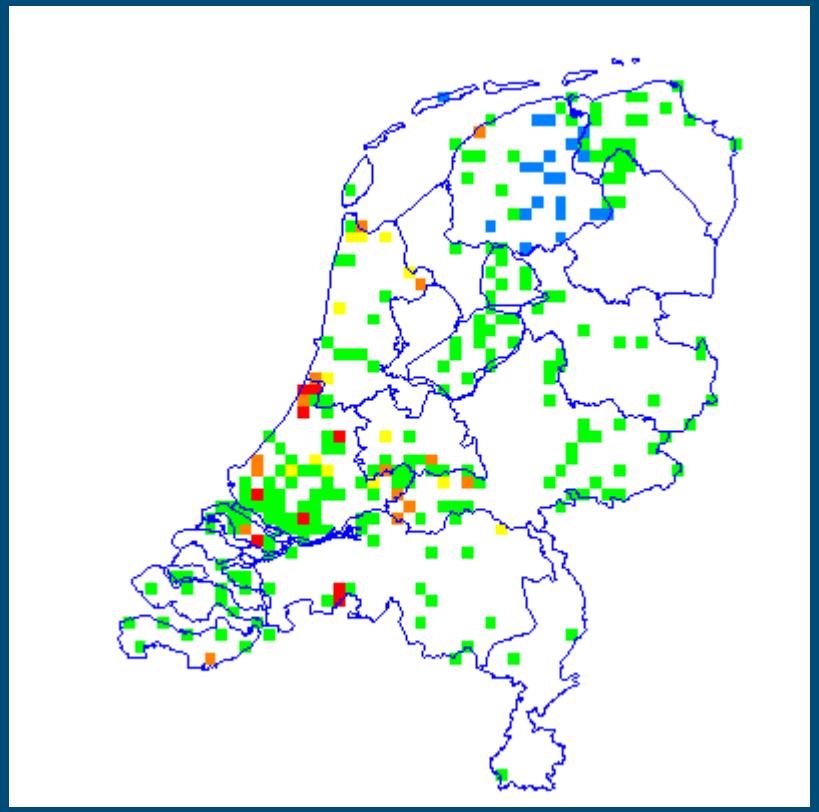
“Those few droplets”

Drinking water standard: 0,1 ug = 0,0000001 gram active ingredient / Liter water

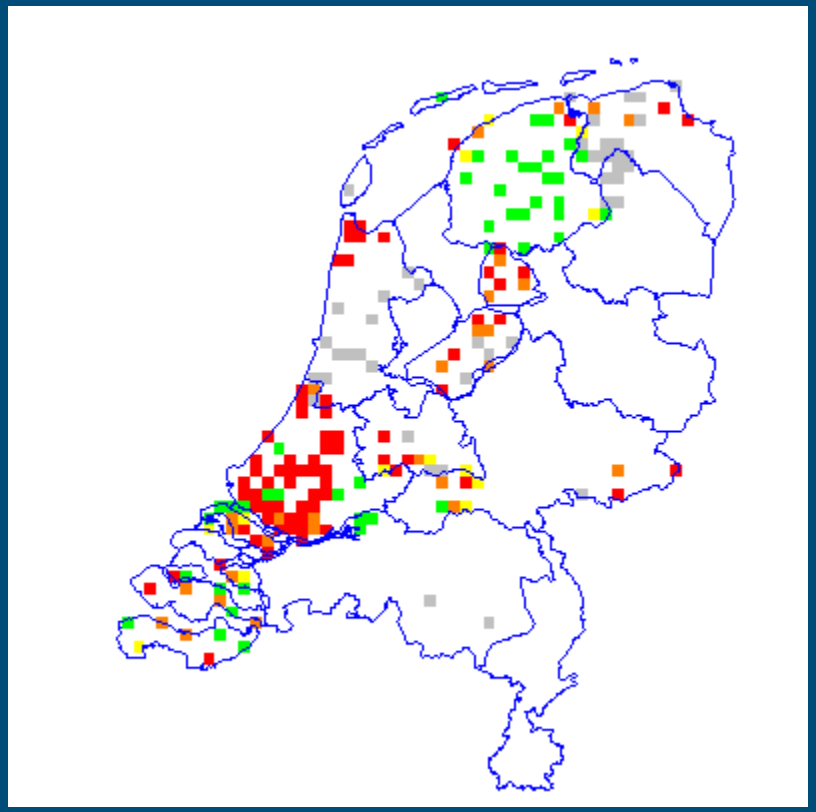
1 gram product: 20 km ditch ‘contaminated’

Ecological standard: more toxic substance = stricter standard

Topsin M / carbendazim



Admire



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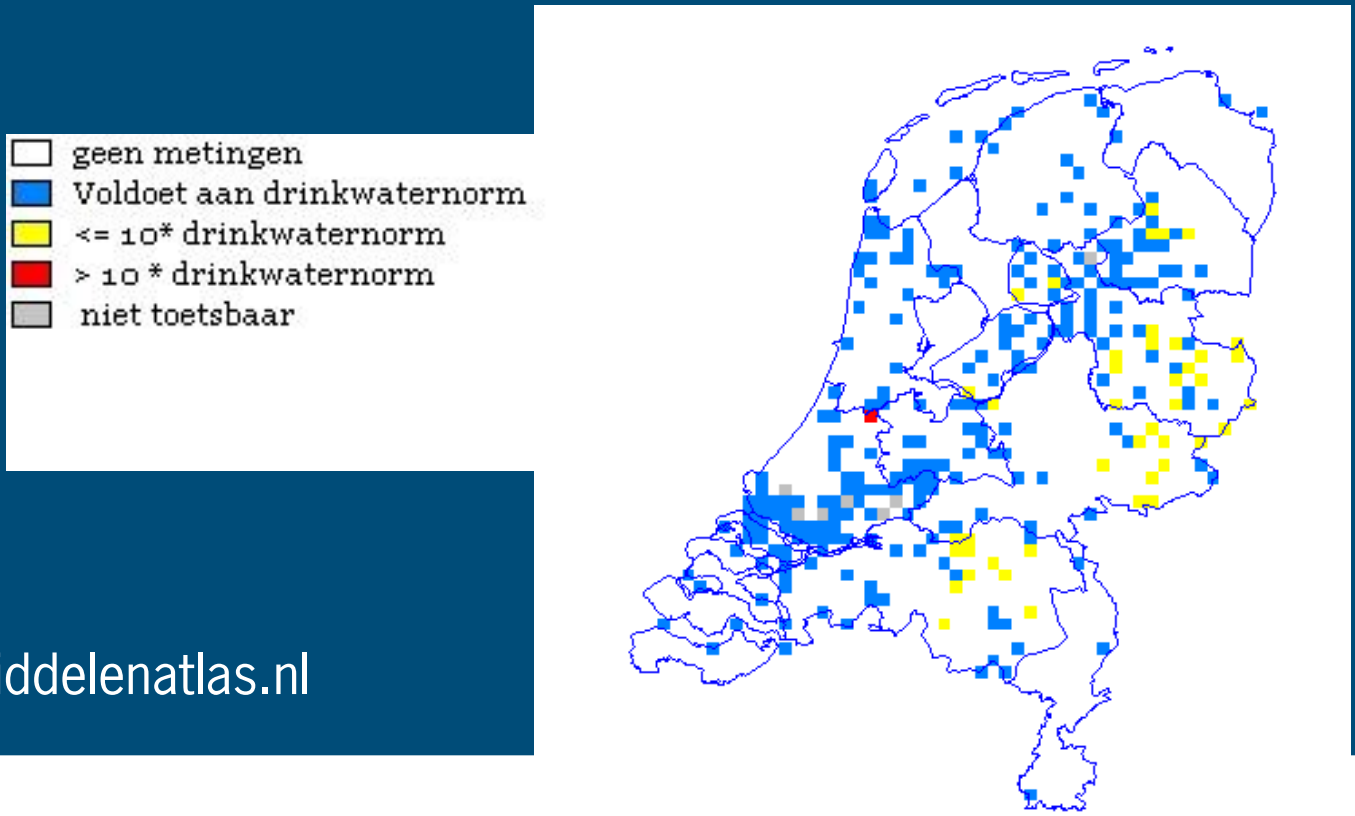
Topsin M / carbendazim Admire

- Maïs herbicide: Terbutylazin 2003-2004
  - Exceeds drinking water value in maïs production areas



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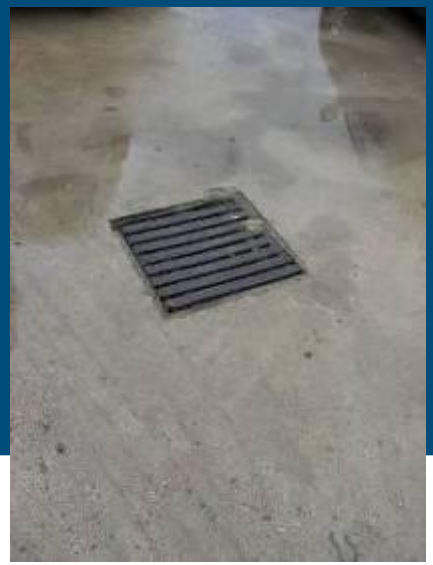
Emission routes: diffuse and point emission

- Diffuse:
  - Wash out through drainage systems
  - Spreading through air
    - Spray drift
    - Evaporation

- Point emission:
  - Often linked to the farm yard
  - Left overs or cleaning water with ppp's
  - Field run off
  - Causes high peaks



Point emissions versus total emission

- In UK, Germany and Sweden
  - 20-70% of the pesticide load comes from point sources
- In UK
  - 40% comes from filling and cleaning sites
- In the Netherlands
  - ?

Minimalising environmental impact

- Legislation on allowing products on the Dutch (European) market
  - Environmental risk assessment (models and tests)
  - Product specific restrictions (mainly on drift reducing techniques)
  - Re-registration procedure (including monitoring results)

- Stimulation of Good Agricultural Practice
  - Regulation of crop free buffer strips
  - Mandatory sprayer inspections
  - Spraying license, with frequent training
  - Collection and processing of empty containers
  - Regulation on waste water (e.g. from cleaning sprayer)

Spraying technique

Opportunities for dosage and emission reduction

- More precise application (time and place)

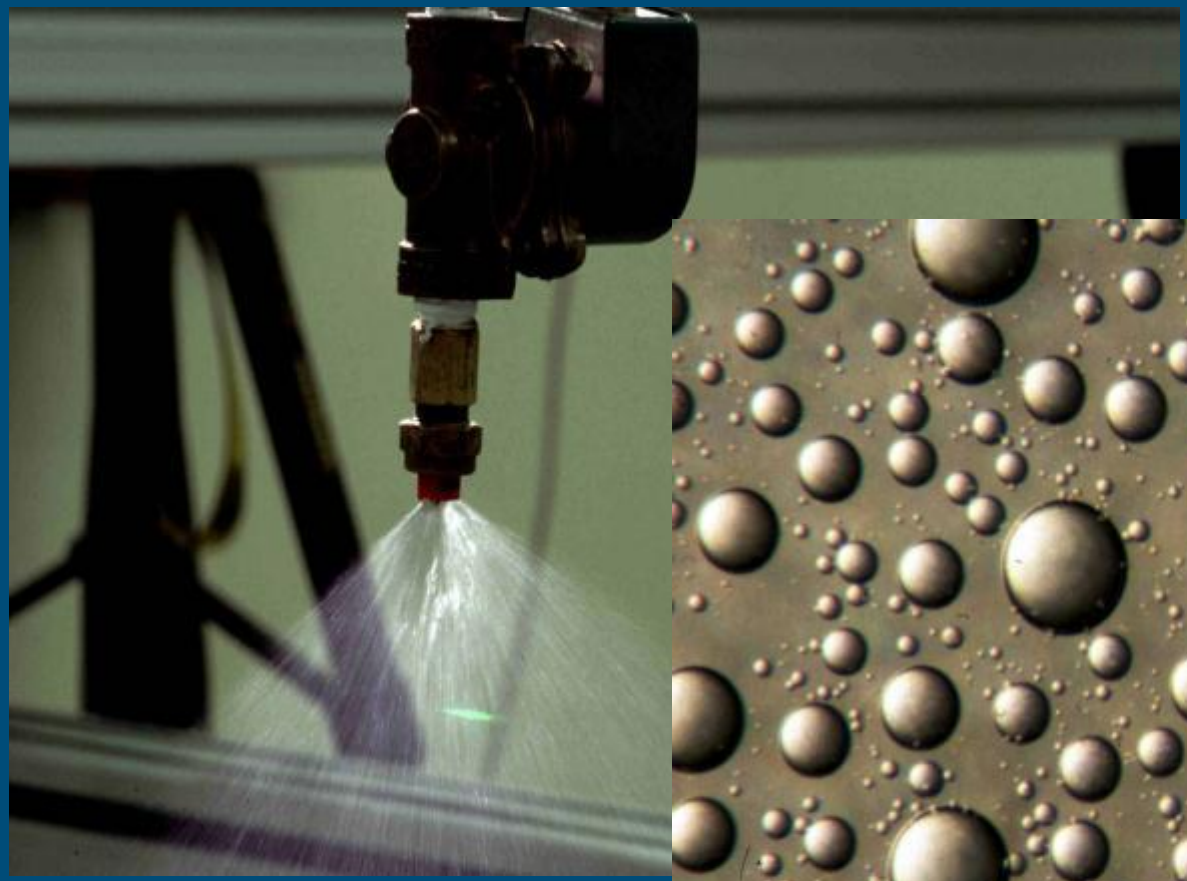
Downwards sprayer

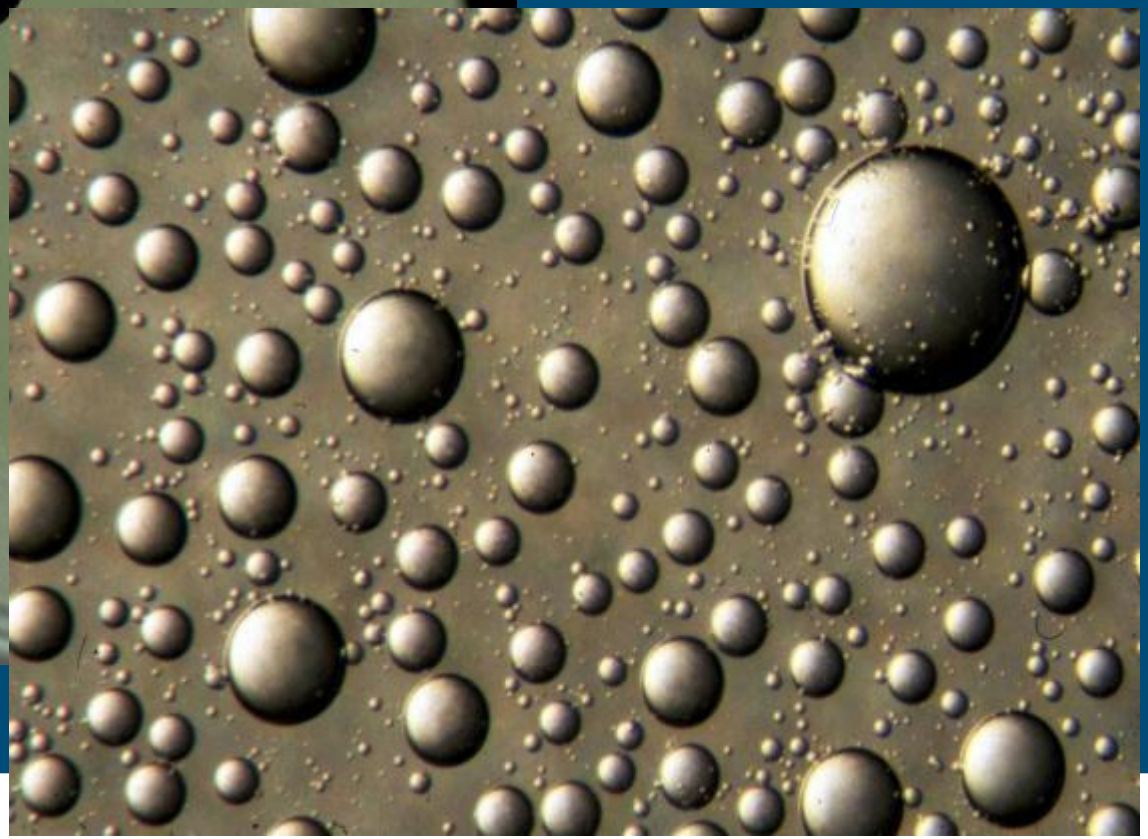
Tree / orchard sprayers

Sensor guided spraying (Phytopthora)

Sensor guided spraying (John Deere 310)

Spray drift reduction





Spray drift reduction

- General sprayer settings:
  - Nozzle type
  - Nozzle capacity (l/sec at standard pressure)
  - Spraying pressure
- Droplet size is always a combination of nozzle type and spraying pressure

Drift reduction with air support (Hardi Twin)

Spray drift (nozzles and air assistance)

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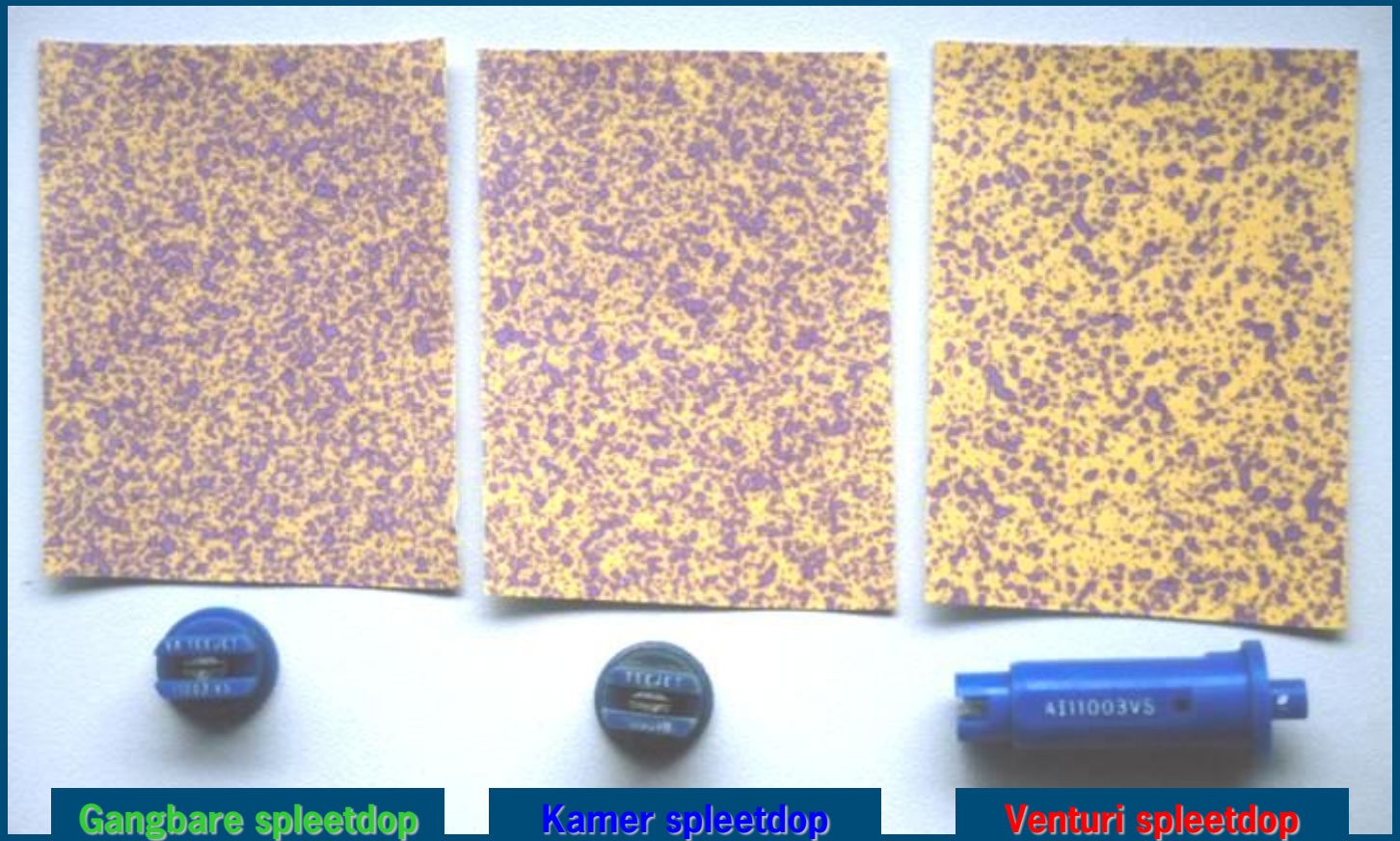
Coverage


60 - 65%
50 - 60%
33 - 38%
Gangbare spleetdop
110-03 2 bar
Kamer spleetdop
110-03 3 bar
Venturi spleetdop
110-03 4 bar

Distance or barrier to surface water

Point sources: risks and solutions

Surface run off

- Can lead to standard exceedances

- Soil structure
- Buffer strips

Contamination and cleaning of sprayers

Filling and cleaning sprayers, planting machine, etc.

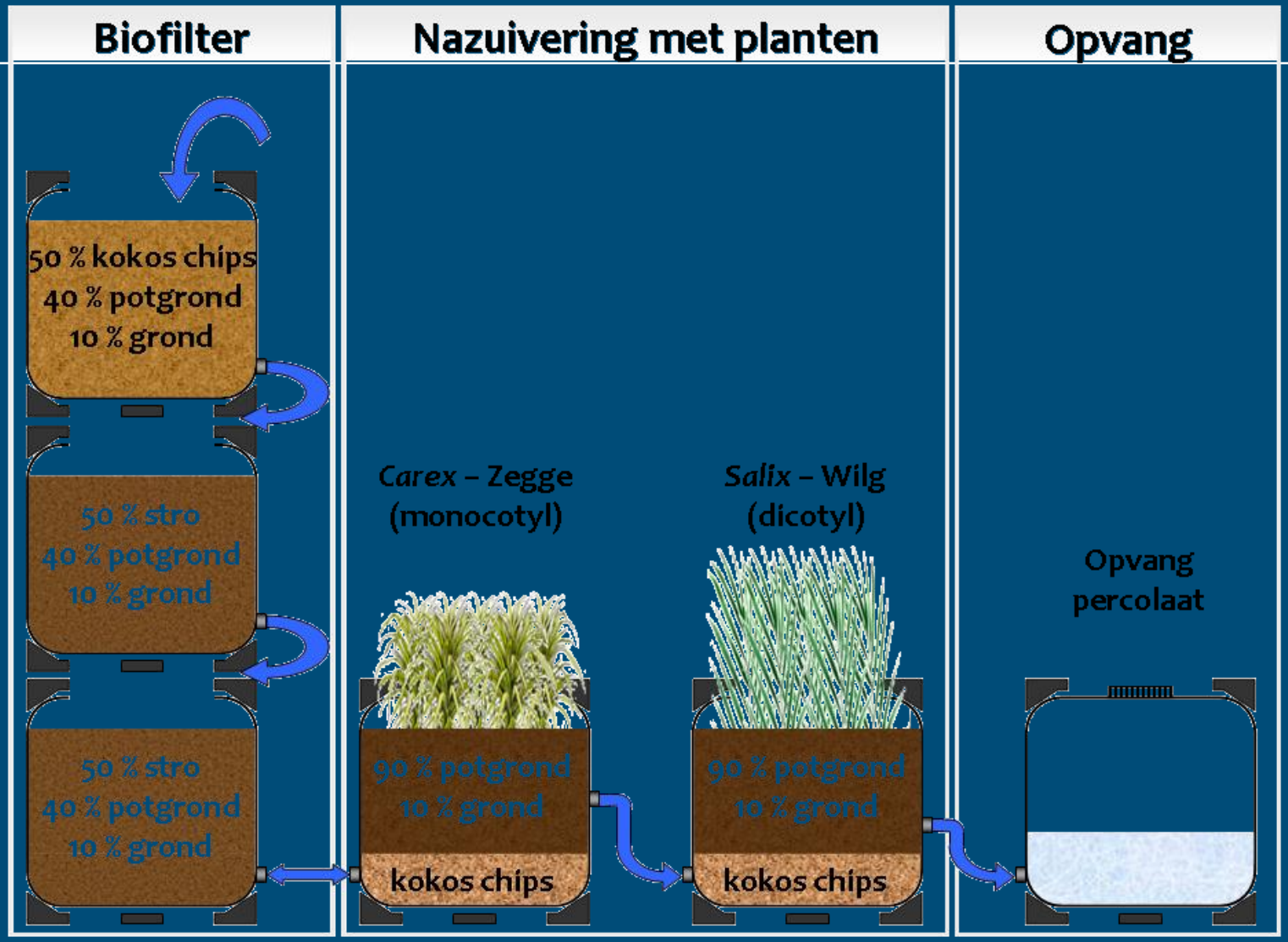
Practice:

- Outside cleaning: mostly at the farm yard (concrete)
- Internal cleaning: Mostly in the field with clean water tank
- Often emission risk at the farm yard

Cheap and simple methods for collecting wastewater

Space saving

Low budget: water cleaning with biofilter



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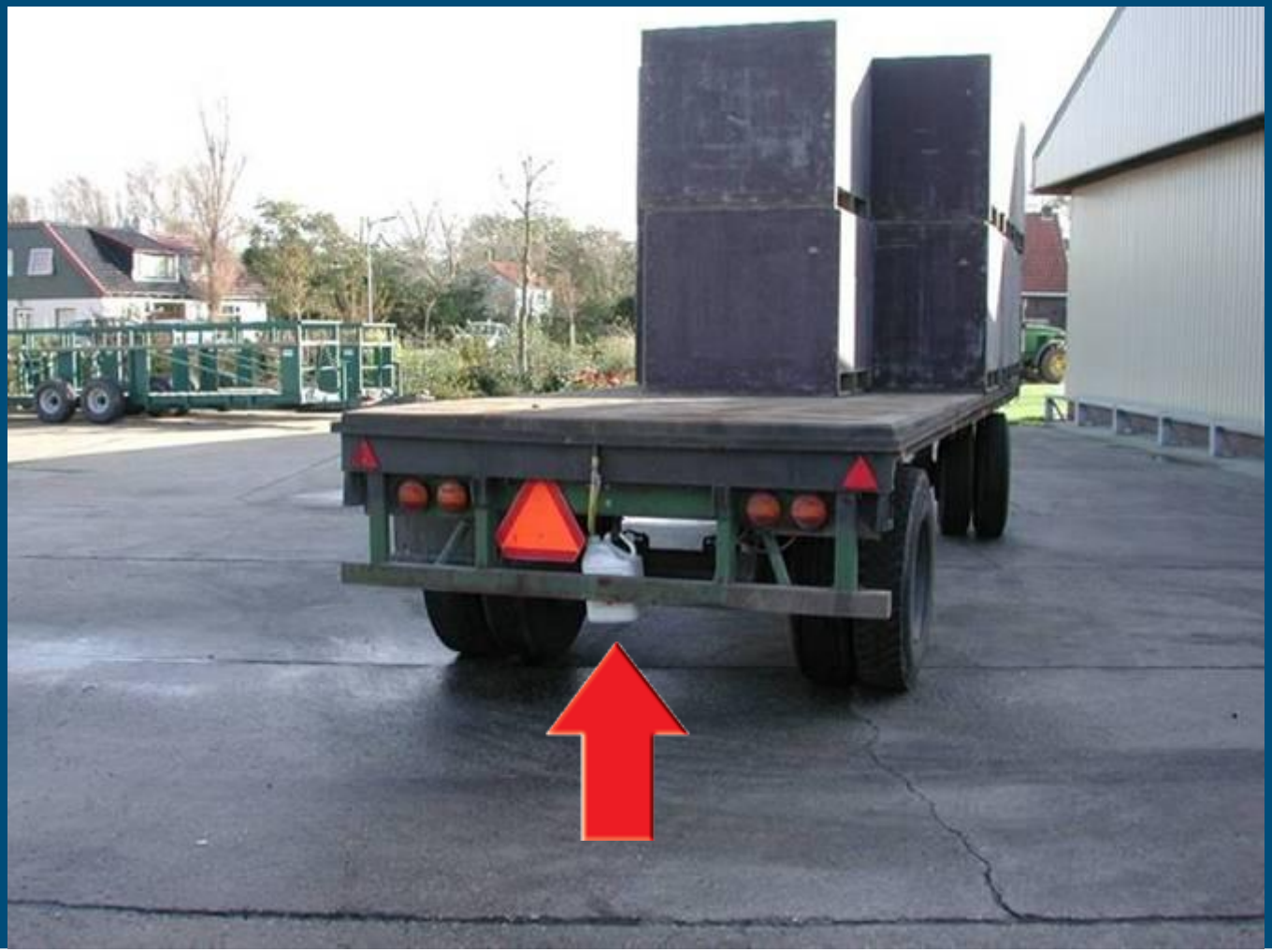
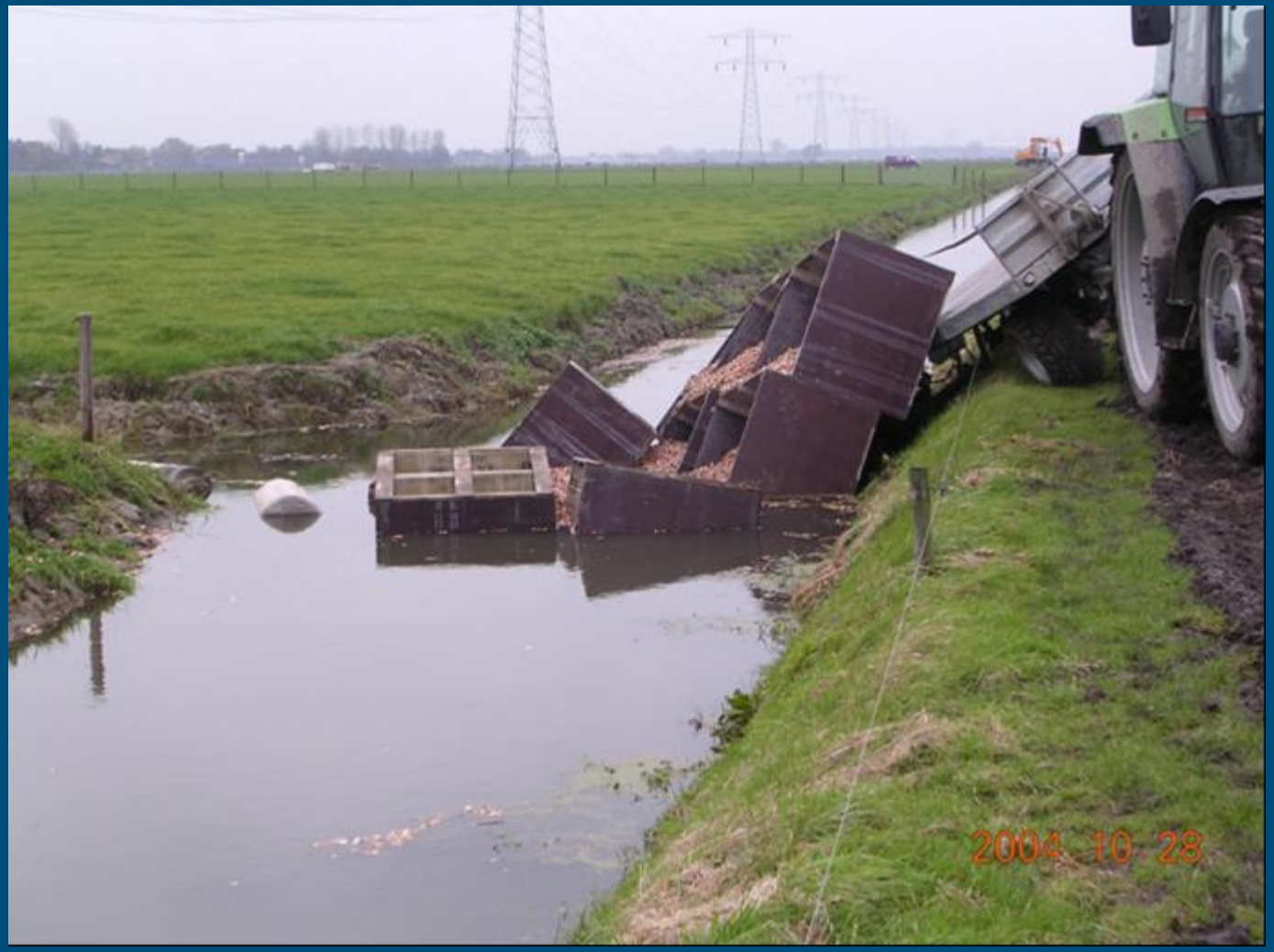
Bulb dipping before planting

carbendazim,
imidacloprid

Transport of treated products: no leakage



Always be carefull



Contaminated boxes and crates

- Wash of by rain

- Loss of cleaning water

Emission from glasshouses

Problematic in many old and modern greenhouses

Emission risks

- Drainage water!
- Condensation water
- Used substrate

Emissions from glass houses

Solutions (under development)

- Better water source / more rain water storage
- (Optimised) recirculation through water treatment
- Purification (oxidation / carbon filtration) of waste water before emission to surface water or sewage system

Comparable: drainage water container field

Transport water from fruit sorting

Rinsing harvested product: leek, flower bulbs…

Reduce water volume and optimise recirculation

- First dry cleaning (leek)
- Enlarge water bassin (dirt settles at bottom)
- Remove fungal spores (settlement or oxidation)

Questions?

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