TOPPS
Water Protection

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TOPPS Water Protection Methodology and Decision Support Tools

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TOPPS Chairman, November 2018

European
Crop Protection

Basic Methodology I

- Multi-partner development of toolboxes of **EU-wide recognized BMPs*** for water protection in agriculture

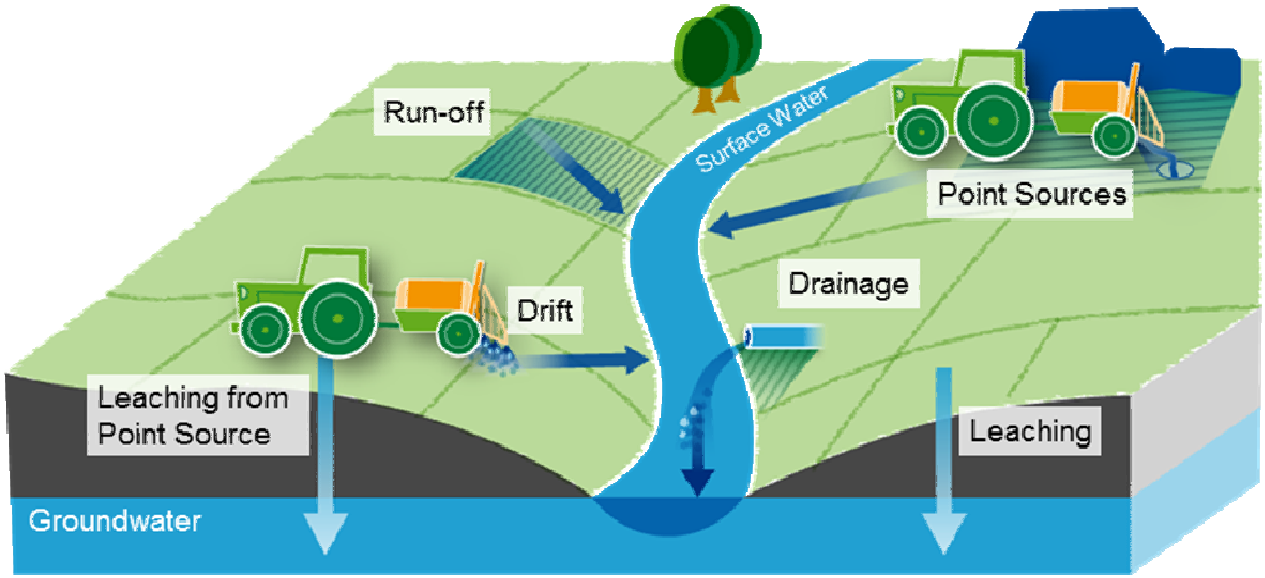
- Achieve a holistic water protection concept at catchment level, **covering all key pollution sources & pathways**

- Promote a **multi-stakeholder approach** to come to solutions, which are **acceptable and economically viable for farmers**

* Best Management Practices

Basic Methodology II

Water Contamination Pathway Analysis



Point sources

- Handling on farm (filling, cleaning, remnant management)
- Before/after spraying in the field

Easy to avoid

Diffuse sources

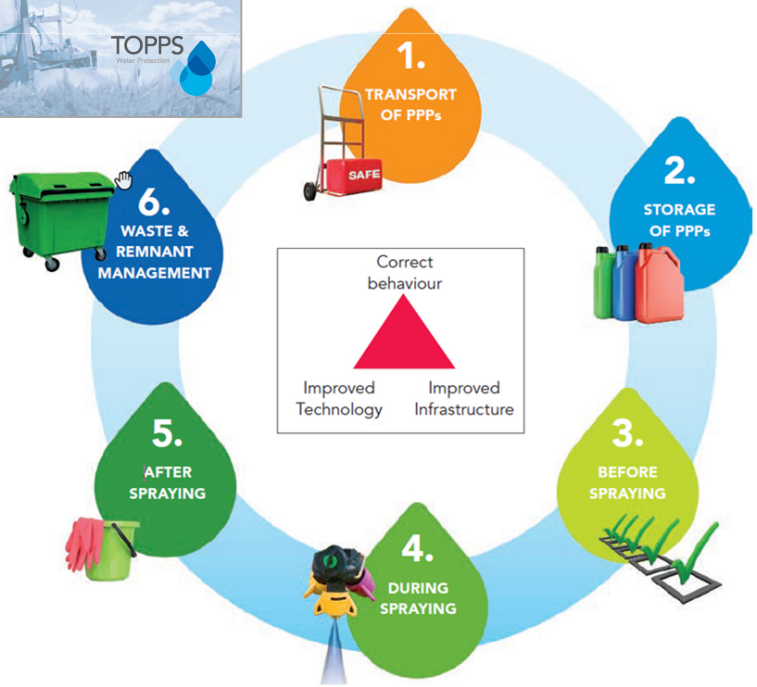
- Surface runoff
- Spray drift
- Drainage
- Leaching

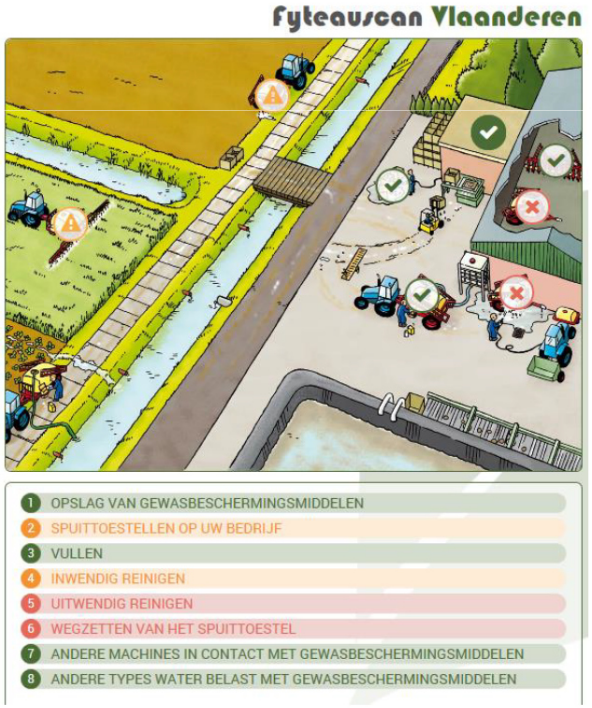
Can be minimized

- **Identification of relevant pathways**
- **Specific risk diagnosis and mitigation**

Methodology: Point Sources

Structured diagnosis and DST*

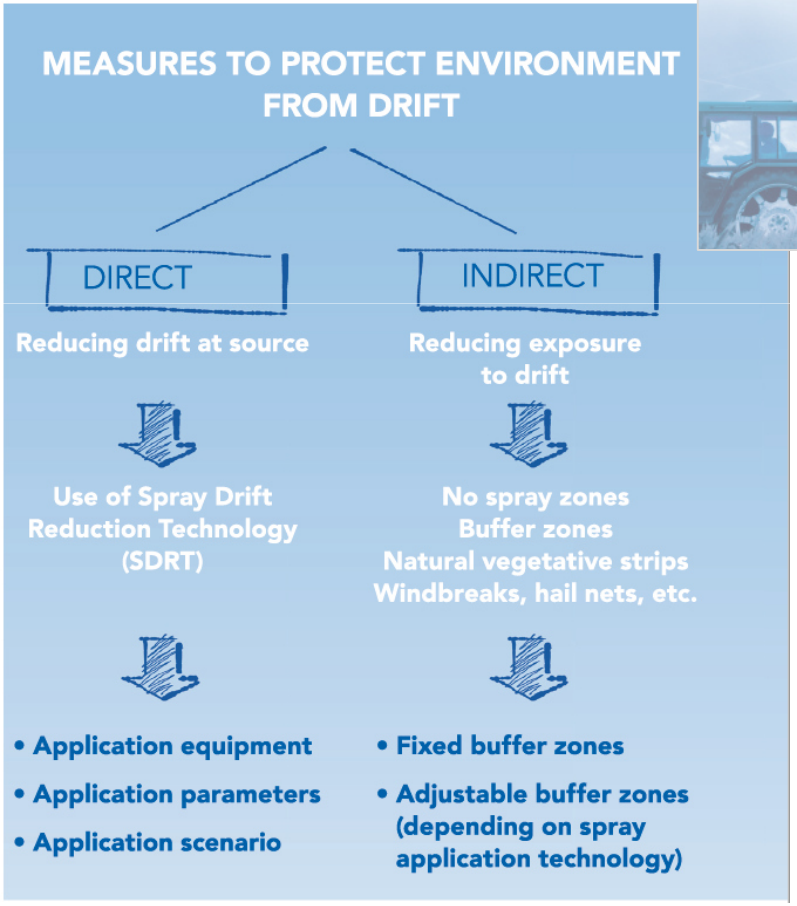




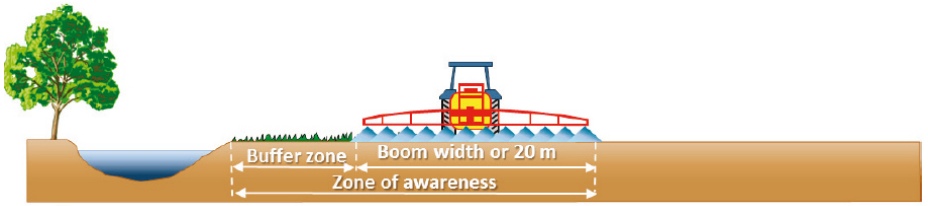
Farmyard Emission Scan

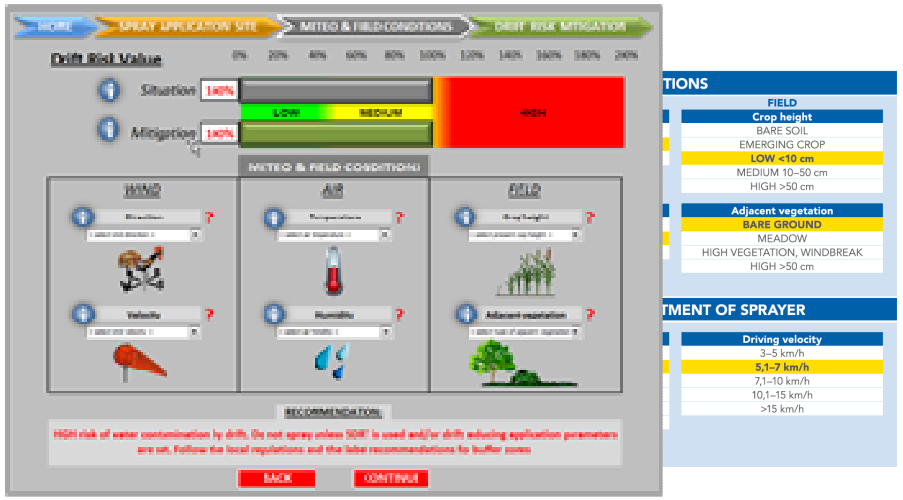
* Decision Support Tool

Methodology: Diffuse Sources
Spray drift risk analysis and DST



Spraying within the zone of awareness





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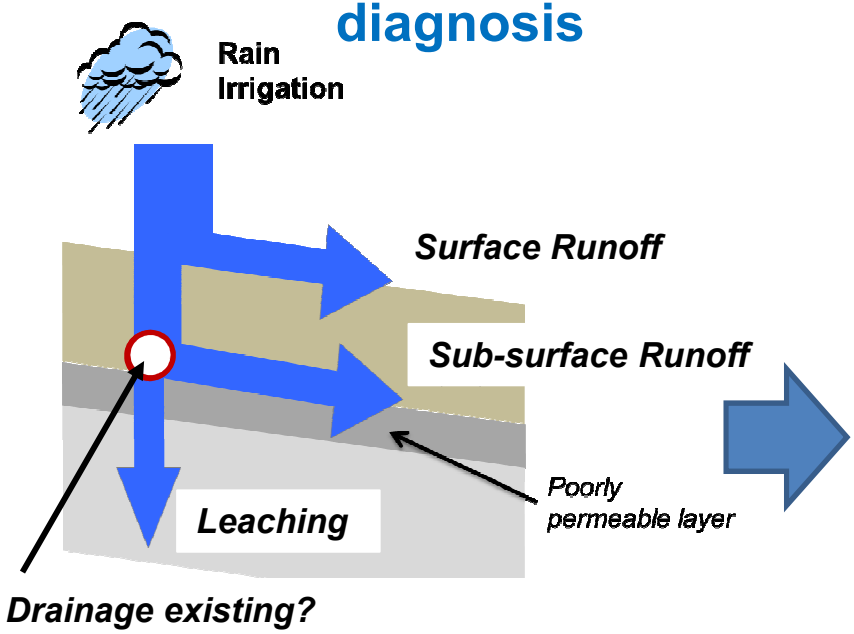
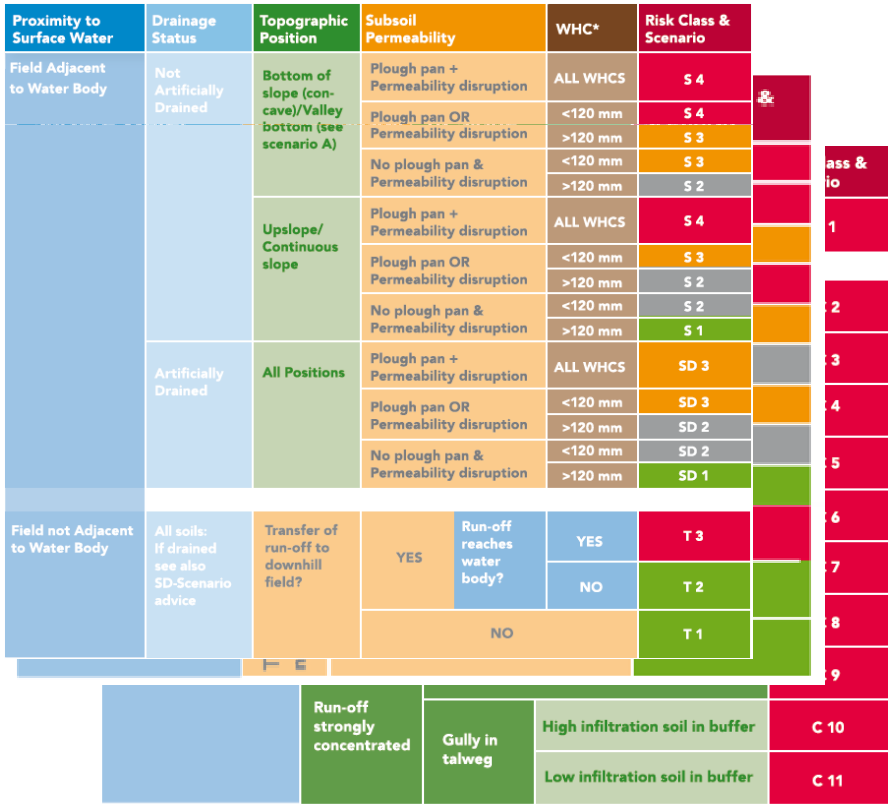
Methodology: Diffuse sources
Water flow analysis and DSTs

Field diagnosis



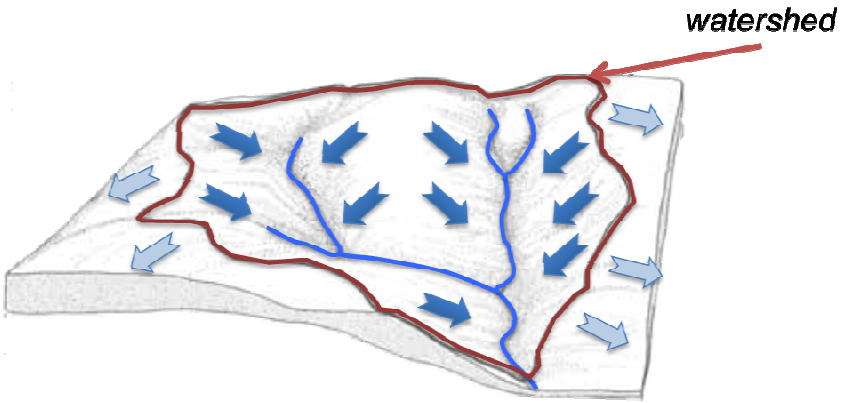
Drainage & Leaching risk decision dashboards

Runoff risk decision dashboards



Methodology: Diffuse sources
Catchment diagnosis and risk maps

Catchment diagnosis: Water flow pathway analysis

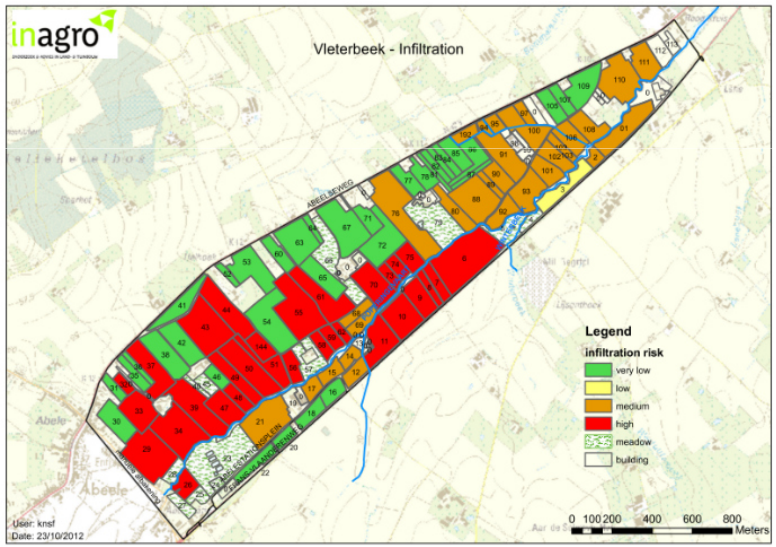


- Water output from field?
- Does runoff reach surface water?
- Do vulnerable areas for groundwater exist?

→ Field visit necessary

Catchment risk maps: e.g.

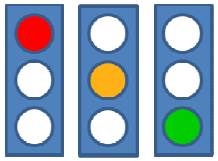
- Infiltration restriction runoff



- Saturation excess runoff
- Concentrated runoff
- Drainage
- Leaching

General Structure of BMPs and Measures

Harmonized Approach

BMP = **Risk diagnosis**  + adapted **mitigation measure(s)**

Measure

"Statement" ↓ **What to do?**	"Specifications" ↓ **How to do it?**
A clear communication in form of a general recommendation statement, which will form the core of the harmonized EU BMP measure.	A detailed description of requirements, materials, conditions, and parameters to consider in order to realize the recommendation goal (Country-specific modifications in national BMP toolboxes)

Example: Runoff BMP Measure
Soil Management

Objective: Stop runoff at source

Prepare rough seedbed

- Establish a rough seedbed with soil clods (do not roll over after seeding)
- Slows down water flow
- Increases infiltration

Establish mini-dams in the field (e.g. potato)

- Small bunds are created in between rows at seeding
- Height and spacing of bunds needs to be adapted to local conditions
- Minimization of runoff and erosion

Example: Runoff Mitigation Measures

Toolbox for Flexible Mitigation

Soil management	• Reduce tillage intensity • Manage tramlines • Prepare rough seedbed • Establish in-field bunds	• Manage surface soil compaction • Manage subsoil compaction • Do contour tilling/disking
Cropping practices	• Use crop rotation • Do strip cropping • Enlarged headlands	• Use annual cover crops • Use perennial cover crops • Double sowing
Vegetative buffers	• Use in-field buffers • Establish talweg buffers • Use riparian buffers • Use edge-of-field buffers	• Manage field access areas • Establish hedges • Establish/maintain woodlands
Retention structures	• Use edge-of-field bunds • Establish vegetated ditches	• Establish retention ponds/wetlands • Build fascines
Adapted use of pesticides	• Adapt application timing • Optimize seasonal timing	• Adapt product and rate selection
Optimized irrigation	• Adapt irrigation technique	• Optimize irrigation timing and rate

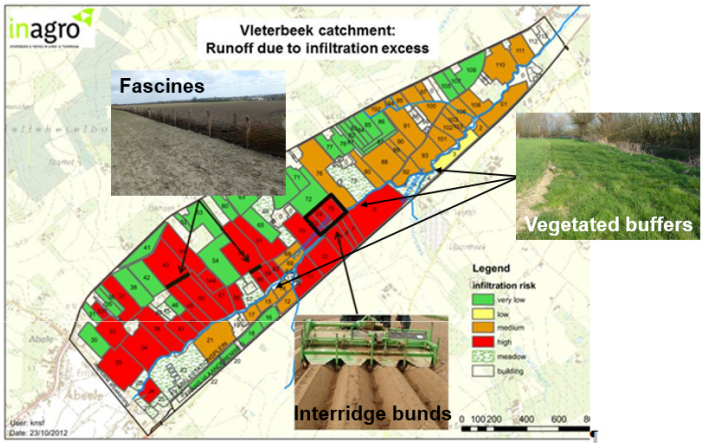
European Crop Protection

Best Practice at Catchment Level

Analysis ⇨ Diagnosis ⇨ Mgmt Plan

Example: Run-off risk diagnosis (BE)

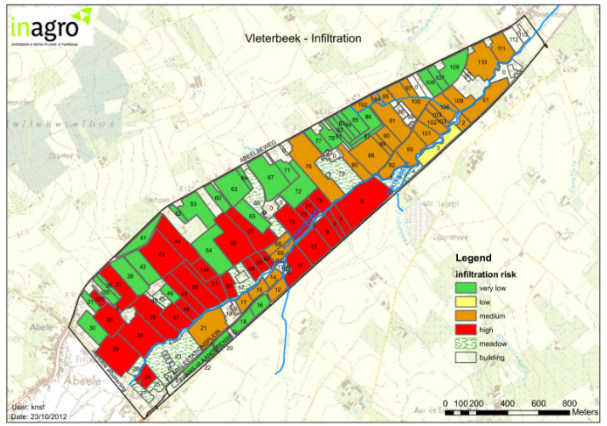
Management Plan



Meeting with farmers

Analysis and diagnosis in the field

Risk Map

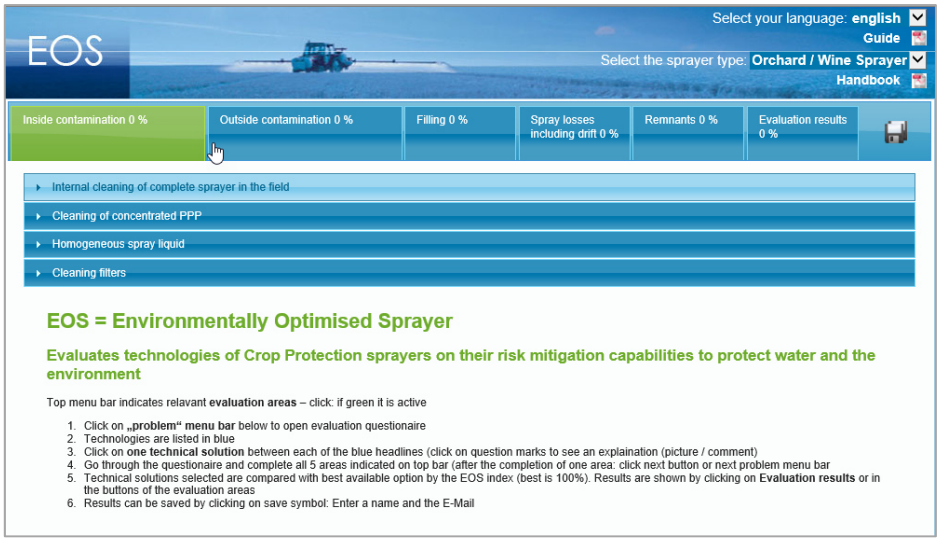


Further Decision Support Tools

Enabling Farmers

Web-based sprayer configuration tools

EOS



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Step-Water

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Conclusions

- TOPPS methodology is science-based and developed in a broad EU-wide multi-stakeholder approach:
  - ⇨ **Pollution pathway analysis**
    - ⇨ **Specific risk diagnosis**
      - ⇨ **Selection of BMP measures**

- Web-based decsision support tools aim to empower many farmers to take decisions standalone

- Further web-based TOPPS DSTs to come to
  - increase the outreach to farmers
  - reduce complexity for decision making

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Thank you for your attention!

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