TOPPS PROWADIS

RUN-OFF/EROSION

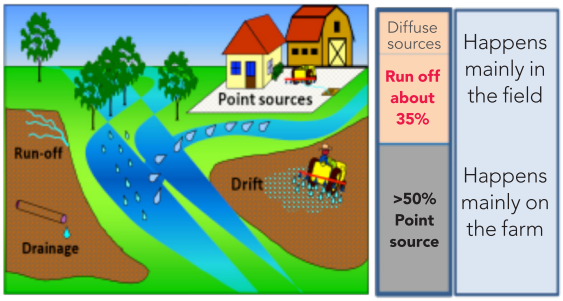
Best Management Practices and better water protection

reduce run-off/erosion

KEEP OUR WATER CLEAN

TOPPS prowadis aims to reduce Plant Protection Products losses (PPP) to water via run-off/erosion from agricultural fields. Best Management Practices (BMP) and diagnosis tools promoted through information, advice, training and demonstration, targeted on farmers, advisers and other stakeholders will help to protect water.

Main entry pathways of PPP to water



Best Management Practices

Run-off and erosion depend on several risk factors, some of which cannot be directly influenced by the farmer. Risks for run-off/erosion can be reduced by implementing appropriate risk reduction measures targeted on different risks.

Risk factors	Risk reduction measures
Rain (intensity/duration)	Soil management
Steepness of land	Crop rotation
Length of slopes	Vegetative buffer strips
Permeability of soil	Retention structures
Proximity to water bodies	Adapted PPP use

REDUCTION CONCEPT FOR RUN-OFF/EROSION

Run-off/erosion cannot be avoided completely, but can be significantly reduced by implementing risk reduction measures following TOPPS prowadis BMP.

1. Diagnose run-off risk before treating each field
2. Select run-off reduction measures
3. Follow TOPPS prowadis Best Management Practices (BMP)

Protect our water!
Keep it clean

Soil is valuable!
Keep it in your field

Protect your livelihood!
Fulfil environmental requirements and make them work for you

Protect your Plant Protection Solutions help to keep broad range of PPP available

UNDERSTAND WHERE WATER GOES TO

EVALUATE THE RISK OF RUN-OFF/EROSION

Understand the water pathways in the field and catchment:
- from where
- where to
- proximity to water

Shortcut to river by pipe

TYPES OF RUN-OFF

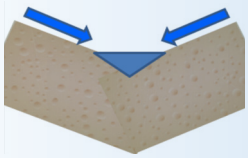
Infiltration restriction:
more rainfall occurs than the soil can infiltrate.
"Rain intensity too high"

Permeability of topsoil is reduced (e.g. via capping)

Saturation excess:
a problem of rain volume and soil water capacity.
"Bucket is full"

- Waterholding capacity limited
- Permeability restrictions in subsoil

Concentrated run-off:
Water flows in a single pathway and starts rill and gully erosion.
"Water seeks a path"



Concentration of water

SIGNS OF RUN-OFF

Capping/crusted soil

Topsoil compaction

Soil water saturated

Signs of soil hydromorphy

Gully erosion

Concentrated flow in talweg

Diagnosis tools have been developed to evaluate the run-off risks (see www.Topps-life.org for diagnosis training)

TAKE CARE AND REDUCE THE RISK.

RUN-OFF RISK REDUCTION CHALLENGES

Keep water in the field – avoid run-off at the source:
- increase infiltration capacity of the soil
- improve soil structure/organic matter
- reduce soil compaction
- slow down speed of water flow
- disperse water against concentration
- retain sediments in fields

Keep the water in the catchment
by collecting and storing the water

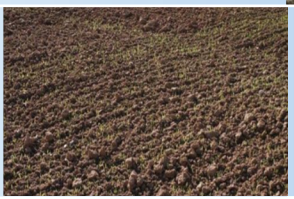
THIS IS YOUR TOOLBOX. YOU JUST HAVE TO USE IT.

Toolbox of reduction measures
SOIL MANAGEMENT

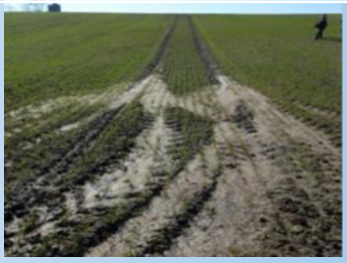
Reduce tillage intensity – keep good soil structure:
- reduce ploughing where possible
- reduce number of travels with heavy machines
- leave organic residues on soil surface

Manage soil compaction – subsoil/topsoil increase infiltration:
- do not plough if soil is too moist
- do not travel on moist soils
- manage compaction with appropriate machines
- grow cover crops with deep roots
- disrupt crusted soil surface (silty soils)

Prepare rough seedbed:
- leave big clods on surface
- reduce tillage intensity
- reduce intensity of PTO-driven tillage



Manage tramlines – reduce water flow, avoid water channelling, break compaction:
- orient tramlines across the slope whenever possible
- alternate the tramline positions each season
- use low-pressure tyres
- where run-off occurs, cultivate or vegetate tramline, or construct small bunds



Toolbox of reduction measures
SOIL MANAGEMENT

Create bunds in the field –
slow down water to increase infiltration:
- use special machines to make inter-row bunds

Contour tilling – slow down water to increase infiltration:
- special machinery needed
- uniform slopes 2 to 10%
- length of slope <35 m

Manage soils that are cracked:
- close cracks formed under dry conditions and avoid soil compaction
- in case of subsurface drainage systems, avoid fast water flow to the drainage
- open cracks are critical for water transfer to drainage or subsoil

Toolbox of reduction measures
CROPPING PRACTICES

Optimise crop rotation –
enhance soil structure and increase infiltration:
- alternate various crops in the field/catchment
- organise and optimise crop rotation in catchment
- increase organic matter content

Implement strip cropping – reduce speed of water:
- reduce slope length by planting various crops across the slope

Toolbox of reduction measures
CROPPING PRACTICES

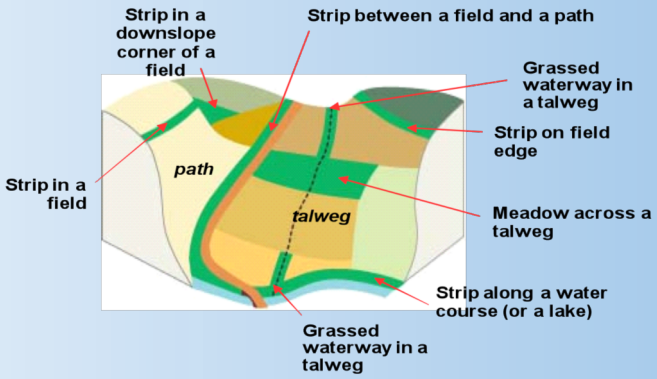
Plant annual cover crops – protect soil structure:
- maximise soil cover by plants or organic materials
- integrate cover crops in your crop rotation plans

Establish cover crops in perennial crops –
stabilise soil, structure and increase infiltration:
- maintain cover crop by mowing to keep plant height <15 cm
- cover the soil surface with organic residues, if permanent plant cover is not possible because of limited water

Toolbox of reduction measures
VEGETATIVE BUFFER STRIPS

Establish efficient buffers to reduce runoff/erosion by infiltration and sediment deposition:
- locate correctly in field & catchment
- choose appropriate width
- maintain permanent vegetation
- enhance biodiversity

Maintain buffer to ensure efficie functioning:
- plant local plant species
- minimise traffic on buffers
- do not spray or fertilise
- keep grass height >15 cm
- remove/distribute soil sediments
- close shortcuts for water



Toolbox of reduction measures
RETENTION STRUCTURES

Retention/dispersion structures to slow down water movement through the catchment:

- natural wetland
- constructed wetland
- vegetated ditch
- bunds/dams
- fascines

Maintain retention/dispersion structures:

- creation and maintenance needs to be organised in catchment
- sediments need to be removed after some time
- dispersion structures are used to disperse concentated runoff

In field water dispersion reduce the risk of water concentration:

- build fascines
- establish small edge-of-field bunds
- build gravel filters

Out-of-field measures:

Buffer runoff movements in ponds/wetlands. Retention time is important for PPP dissipation.

Toolbox of reduction measures
USE OF PLANT PROTECTION PRODUCTS (PPP)

Apply PPP following the label:

- at the right place
- at the right time
- at the right amount
- with the right equipment
- in case of questions contact your adviser

Plan and optimise PPP application timing:

- check local weather forecast – do not spray when heavy rain is forecasted (time between application and next rain is a critical factor)
- check soil conditions and water saturation status in the field – do not spray when soil is frozen or water-saturated
- check if drains are flowing-postpone applications if they are or adapt PPP selection (consult advisor/manufacturer advice)

Example: situation varies according to water saturation of soil

Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.
			X	X	X	X					
X	X	X					X	X	X	X	X
			X			X					

X **Drainage flow** X **Application possible** X **PPP of less concern**

Select appropriate PPP or crop protection solution if runoff risk is high:

- follow crop protection advice in your area
- select less mobile PPP, evaluate dose reduction/mixtures
- consider alternative plant protection solution
- consider growing other crops

Implement Best Management Practices to reduce losses of PPP to water from run-off/erosion:

- evaluate the field specific risk for runoff/erosion
- select appropriate risk reduction measures
- implement the measures and monitor their efficiency

WITH YOUR HELP, WE CAN HAVE CLEANER SURFACE WATER

TOPPS PROWADIS

TOPPS prowadis is a three-year multi-stakeholder project which started in 2011, covering 7 European countries implemented by local partners and experts.

TOPPS stands for Train Operators to Promote Best Management Practices & Sustainability.

TOPPS is funded by the European Crop Protection Association (ECPA).

TOPPS aims to reduce losses of Plant Protection Products to water.

For further information visit www.TOPPS-life.org

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