

## SPRAY DRIFT



Best Management Practices  
and better water protection  
reduce spray drift

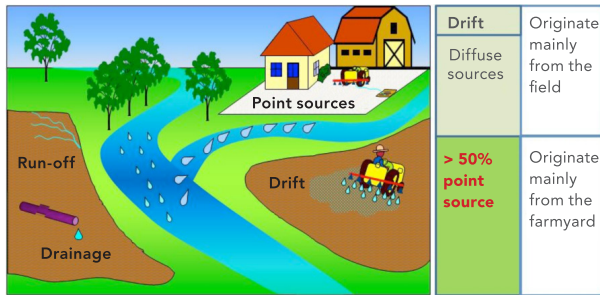




## YOU CAN HELP TO PROTECT OUR WATER. THE TOPPS OBJECTIVES

TOPPS aims to reduce pesticide (PPP) water contamination both from diffuse and point sources. The project defines Best Management Practices (BMP) and promotes them through information, advice, training and demonstration targeted on farmers, advisers and other stakeholders.

### Main entry pathways of PPP to water



## Together we can protect the environment.

### The TOPPS prowadis project

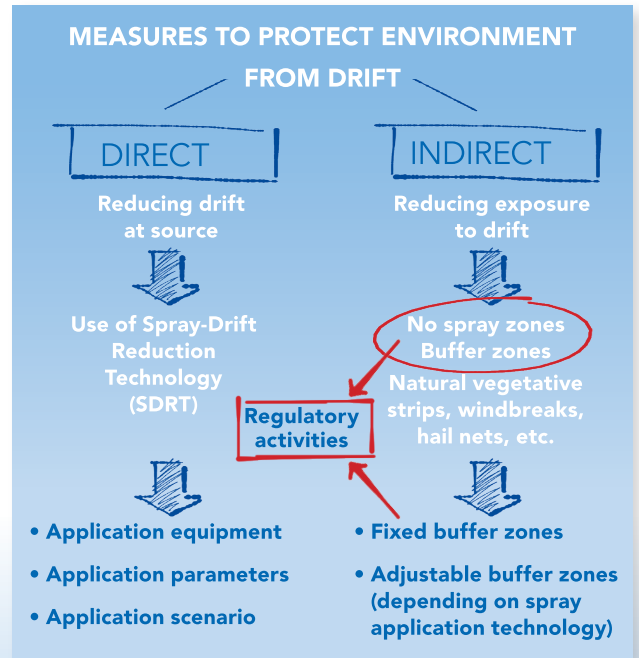
TOPPS prowadis is a three-year multi-stakeholder project which started in 2011, covering 7 European countries, executed by local partners and experts. TOPPS stands for Train Operators to Promote Best Management Practices & Sustainability. TOPPS prowadis is focused on reducing PPP entries to water from diffuse sources – run-off/erosion and spray drift.

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



## SPRAY DRIFT

**Definition: unintended losses of PPP outside the treated field during application**



## THE KEY POINTS TO REDUCE DRIFT.

Spray drift is a concern for:

- Sprayer operator and bystanders
- The environment
- Neighbouring crops
- Housing and public areas

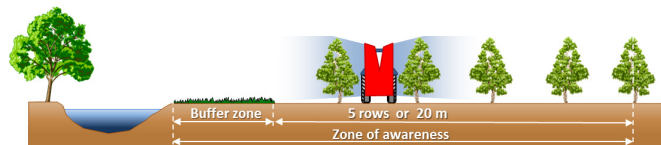
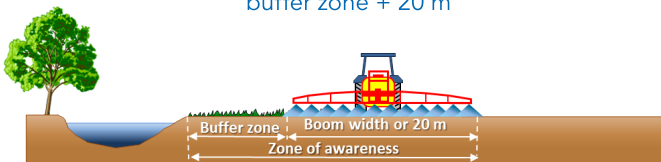


## DRIFT RISK CAN BE REDUCED THROUGH DRIFT RISK MANAGEMENT

The risk for spray drift depends on several factors; some of these factors cannot be directly influenced by the operator. Spray drift can be strongly reduced by implementing appropriate risk-reduction measures.

Risk factors	Risk reduction measures
PROXIMITY to sensitive area	<ul style="list-style-type: none"><li>• Map fields adjacent to sensitive areas</li><li>• Respect distance regulations</li><li>• Read PPP label</li></ul>
WIND: high speed and direction towards sensitive areas	<ul style="list-style-type: none"><li>• Observe weather conditions and forecast</li></ul>
AIR: high temperature and low humidity	<ul style="list-style-type: none"><li>• Use anti-drift technology and choose the best hour of the day (morning, evening)</li></ul>
FIELD CONDITION: vegetation in and around the field (height/density)	<ul style="list-style-type: none"><li>• Adjust spray equipment correctly</li></ul>
INADEQUATE SPRAY APPLICATION: inadequate equipment, sprayer adjustment and operation	<ul style="list-style-type: none"><li>• Consider drift reduction BMPs before and during operation</li><li>• Use adequate equipment</li></ul>

Spraying within the zone of awareness  
buffer zone + 20 m



## IT'S AS EASY AS THAT: THREE STEPS TO BE FOLLOWED.

**1** Diagnose spray drift risk before each application



**2** Select drift reduction measures

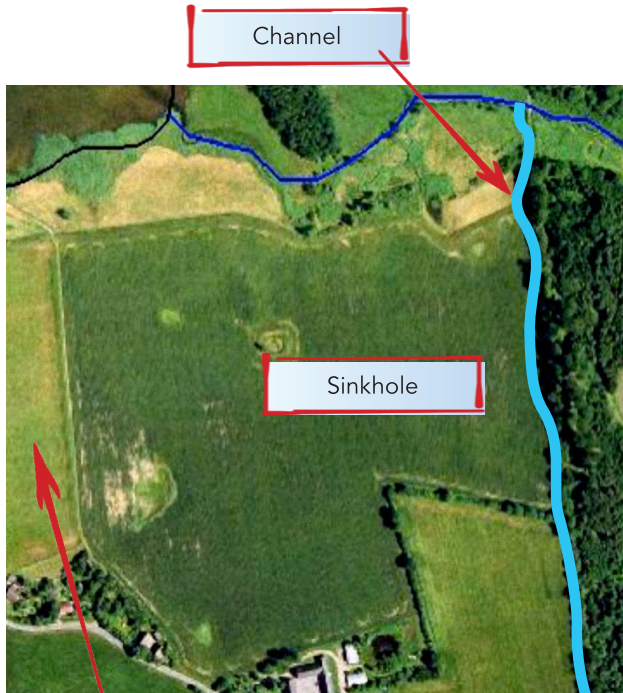


**3** Follow TOPPS-prowadis Best Management Practices (BMP)



## HOW YOU CAN DIAGNOSE THE SPRAY DRIFT RISK.

a) Determine the proximity of the application site to a sensitive area (map your fields/plantations).



b) Evaluate the spray drift risk factors related to weather and field conditions

### WIND

- Speed
- Direction



### AIR

- Temperature
- Humidity



### FIELD CONDITIONS

#### Crop status in field

- Crop height
- Crop density

#### Adjacent vegetation

- Bare soil
- Meadow
- Hedge/windbreaks










### Best Management Practices

Spray fields adjacent to sensitive areas when weather conditions are most favourable:

- Wind direction away from sensitive area
- Wind speed <2.5 m/s
- Moderate temperature (<25 °C)
- Humidity >50%

### Best Management Practices

Do not spray when wind blows towards the sensitive area and wind speed exceeds 5 m/s

WIND SPEED (m/s)	INDICATORS
0	 Smoke rises straight up
1	 Smoke drifts
2-3	 Wind felt on face, leaves rustle
4-5	 Leaves and twigs move, light flags flap
6-7	 Small branches move

### Best Management Practices

If you operate in the zone of awareness make a drift risk diagnosis and consider drift reduction measures.

Use the drift evaluation tools:

## DRIFT RISK EVALUATION TOOL

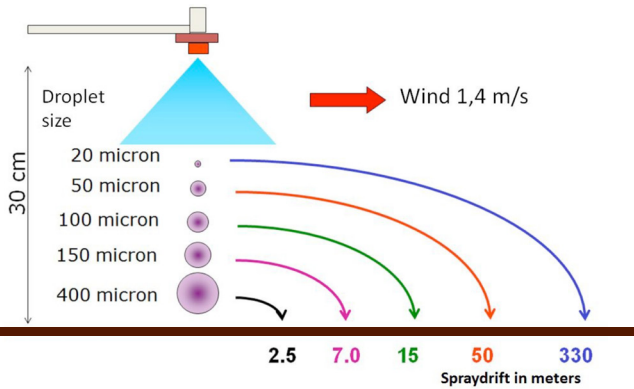


[www.TOPPS-drift.org](http://www.TOPPS-drift.org)





## THIS IS KEY: select the right droplet size.



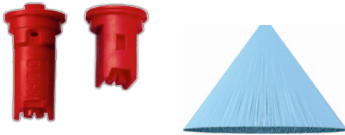
Fine droplets <100 µm represent a high drift risk

### Best Management Practices

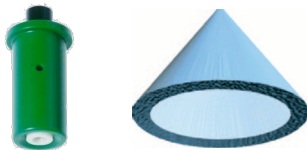
Reduce amount of fine droplets by anti-drift nozzle technology. Check nozzle manufacturer's information.

#### Air induction flat fan nozzles

operated between 2 and 8 bar **reduce spray drift by 70–90%** compared with conventional flat fan nozzles.



**Air induction hollow cone nozzles** operated between 3 and 10 bar may reduce spray drift by 75% compared with conventional hollow cone nozzles.



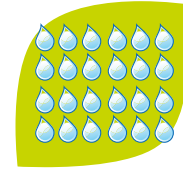
### Best Management Practices

Be aware that small droplets can theoretically cover a bigger area. However, high losses due to wind and low penetration need to be considered.

Today, modern PPP with innovative formulations deliver excellent efficacy without fine droplets.



- less prone to drift
- better penetration



- higher losses due to drift
- less energy to penetrate crops

### Best Management Practices

Equip your sprayer with multi-nozzle holders to easily select the appropriate droplet spectrum and to reduce spray drift risk (e.g. anti-drift nozzles close to sensitive areas).



## THIS IS KEY: distance from sprayer to target.

The bigger the distance from nozzle to target, the higher is the risk of generating spray drift.

### Best Management Practices

Adjust boom height correctly, not higher than 50 cm. Consider that boom height at 75 cm increases the drift risk by 50% compared to a height of 50 cm.





## THIS IS KEY: sprayer type and adjustment.

### FIELD CROP SPRAYERS

Spraying speed: the faster the sprayer speed, the longer is the time fine droplets remain drifting in the air.

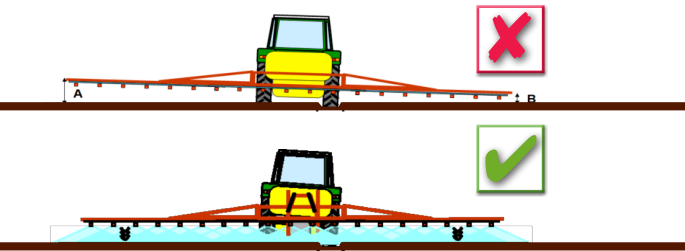


#### Best Management Practices

Do not increase spraying speed above 8 km/h when spraying close to sensitive areas.

#### Best Management Practices

Choose spray boom technique which is stable when driving on uneven fields



#### Best Management Practices

Consider use of air-assisted boom sprayers when PPP applications are often carried out in windy situations. When air-assisted sprayers are used on bare soil, or soil with poor crop cover, reduce the air speed.



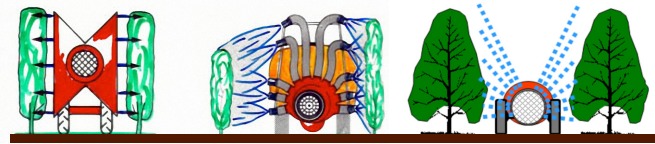
No air assistance

With air assistance

## ORCHARD SPRAYERS

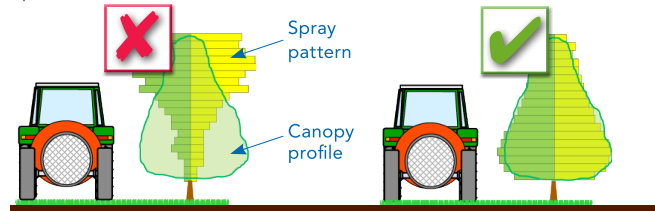
### Best Management Practices

Prefer the use of tower-shaped or multi-spout air-assisted sprayers which can be adjusted more precisely to the canopy profile compared with conventional axial fan sprayers. This allows the distance between the nozzles and the target to be reduced.



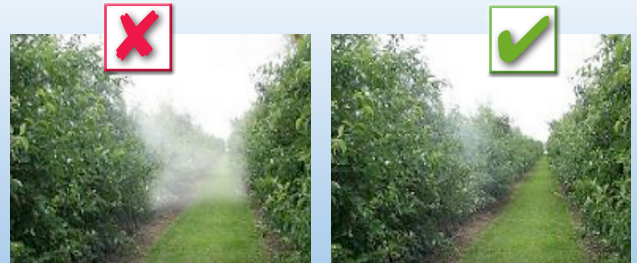
### Best Management Practices

Adjust spray output to crop shape and canopy to minimise spray losses.



### Best Management Practices

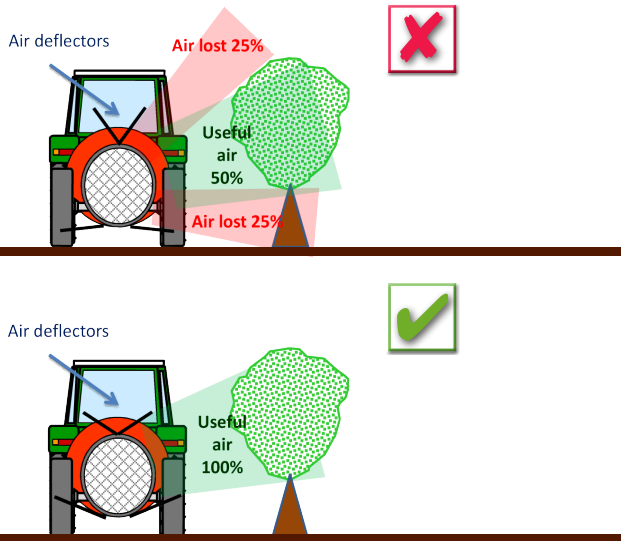
Correctly adjust the air flow output according to the canopy density. Consider that a correct air flow adjustment may reduce spray drift by 50%, and that in most applications too much air is used!



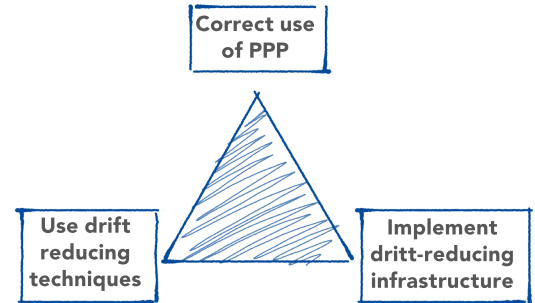


## Best Management Practices

Properly adjust the air flow direction in order to match the canopy profile using air deflectors.



## FOLLOW TOPPS PROWADIS BEST MANAGEMENT PRACTICES (BMP)



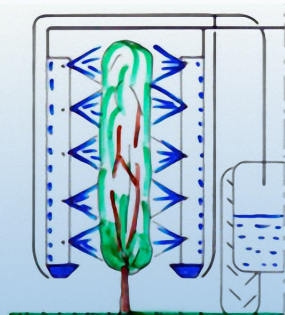
- Use right equipment
- Adjust sprayer correctly
- Operate sprayer with care
- Implement buffer zones
- Retention structures (hedges, hail nets, etc.)

## FOLLOW PPP LABEL!

**Be aware of local regulations concerning buffer zones**

## Best Management Practices

Consider the use of shielded sprayers (e.g. tunnel sprayers) which are able to capture drift and to recycle spray losses.



All materials developed in TOPPS projects can be found at: [www.TOPPS-life.org](http://www.TOPPS-life.org)

Drift risk evaluation tools for field, orchard and vineyard applications can be found at: [www.TOPPS-drift.org](http://www.TOPPS-drift.org)  
Inform yourself about environmentally optimised sprayer technologies at: [www.TOPPS-eos.org](http://www.TOPPS-eos.org)

Let's work together. For our environment and clean water.



Protect our water!  
Keep it clean

The cloud must disappear!  
PPP losses cost efficacy

Protect the environment!  
Fulfil environmental requirements  
and make them work for you

Reduce contamination risk  
for you and others

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



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