Short course on how to reduce spray drift
Reduce PPP losses from diffuse sources
Spray drift

Key factors

- Wind speed
- Wind direction
- Temperature
- Air humidity
- Proximity to water
- Proximity sensitive area
- Crop treated
- Adjacent vegetation
- Droplet size
- Application technique
- Adjustment of sprayers
Be aware of the external conditions when spraying close to sensitive areas

**Proximity to sensitive areas**
- Plan thoroughly your application if you need to spray in the zone of awareness
- Respect distance regulations
- Select optimal time of the day

**Wind speed**
- Select spraying when wind blows towards sensitive area and wind speed is > 3 to 5 m/s

**Temperature**
- Spray when temperature is < 25 degrees and air humidity is > 40 %

**Wind direction**
- If possible postpone spraying when wind blows towards sensitive area and wind speed is > 3 to 5 m/s
Air induction nozzles allow to reduce the amount of fine droplets other dispersion techniques are less flexible

- Droplets below 100 micron cause the main drift risk
- Small droplets are lost by wind, thermic turbulence and may evaporate at low air humidity
- Coarse droplet spectra have shown comparable biological activity

Avoid droplets < 100 micron
Nozzles are classified in some countries (in % drift reduction, up to 99%)
Distance regulations are linked to the use of antidrift technologies according to local regulations
Key recommendations to manage spray drift in field applications

- **Droplet size**: reduce amount of fine droplets
- **Boom height**: the lower the better ≤ 50cm
- **Driving speed**: keep speed along sensitive areas < 8 km/h
- **Sprayer with air support**: (bare soil !)

[Diagram of a tractor spraying field]
Key parameters to manage spray drift in orchard / vine applications

**Direct measures**
- Reduce fine droplets
- Optimize sprayer adjustment
  - air support
  - liquid volume
- Select best spray scenario
- Select drift reducing sprayer

**Indirect measures**
- Hedgerows catch spray drift
- Hailnets reduce spray drift by about 50%
- Consider buffer strips / untreated zones
Key recommendation to manage drift in orchard / vine
USE COARSE DROPLETS

- Use nozzles with low amount of fine droplets
- Comparable efficacy for most PPP

Air injector nozzles

Air induction nozzles (hardly visible)

Standard hollow cone nozzles
Key recommendations to manage drift in orchard / vine
ADJUST AIR DIRECTION, AIR VOLUME AND AIR SPEED

Orchard / vine sprayers transport the droplets into the canopy with the help of air.

• AIR direction / height need to be adjusted by windshields

• Windshields need to be adjusted according to unsymetric air volume and speed

• AIR volume can be adjusted by PTO speed at the tractor or gear box at the sprayer

General observation:
Often applications are done with too much air volume.
More technical adjustment possibilities would be beneficial
Key recommendations to manage drift in orchard / vine
ADJUST LIQUID OUTPUT TO CHANGING CANOPY

Big challenge is the correct adjustment of the spray output to the crop canopy

• spray volume need to cover and penetrate the shape and structure of the canopy

• nozzles with different spray output need to be arranged to fit the canopy

• Several adjustments needed during the season as canopy develops

The images shared by courtesy of Health and Safety Executive – UK. Walklate et al. 2003.
Key recommendations to manage spray drift in orchard / vine

SPRAY SCENARIO: spray border rows from outside in

- if wind blows towards a sensitive area, spray border rows from outside in
- modify airsupport to balance the drift risk

Spray scenarios can be used if later spraying cannot be postponed or sudden change of wind direction occurs.
Key recommendations to manage drift in orchard / vine

VARIOUS SPRAYERS ARE ABLE TO REDUCE DRIFT

Axialfan sprayer with installation
• distance to target more equal
• Air directed to canopy

Pictures: Ipach DLZ-Rheinpfalz

Tangential- fan sprayer
• distance to target more equal
• Air directed parallel to canopy

Tunnel sprayer
• drift is collected by shields
• Special training of crop is necessary / cannot operate everywhere

Measurement of drift reduction concentrates on complete sprayer and its configuration – a challenge
Understand more about drift risks and drift reduction

www.TOPPS-drift.org

Field crops / Orchards / Vine – 8 languages
Education and awareness
... We have means for the cloud to disappear
Acknowledgement

This presentation is based on results from the European wide TOPPS – prowadis project intended to reduce losses of Plant Protection Products to water from diffuse sources (spray drift and runoff). The project developed Best Management Practices (BMPs) and disseminates these through information, trainings and demonstrations.

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