

Drift Evaluation Tool

Drift risk diagnosis and effects of mitigation measures

TOPPS stakeholder workshop
Nov 14th 2018 Brussels
Greg Doruchowski
TOPPS-country coordinator
INHORT Skierniewice, POLAND

Spray drift is always there !



Key questions for better decisions

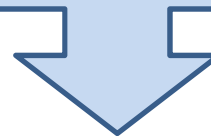


What is the risk of water contamination due to drift in S P E C I F I C weather and field situation ?

What factors need to be considered to assess the risk?

What measures can be used to mitigate the risk ?

How efficient are the measures ?

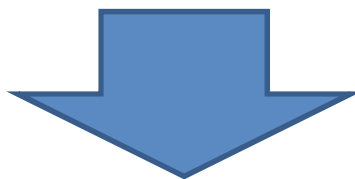


EVALUATION TOOL

Objectives

Interactive and user-friendly application:

- diagnose the drift risk
- propose risk mitigation measures



- help the operator make better decisions
- reduce risk of contamination of water and other sensitive areas due to spray drift

english ▼

danish
english
french
german
italian
nederlands
polish
spanish

Understand the factors influencing spraydrift of Plant Protection Products
and how mitigation measures can be used to reduce it



These evaluation tools were developed in the European
TOPPS-prowadis project in collaboration with partners
and experts from 7 EU countries (BE, DE, DK, ES, FR, IT,
PL)

The project was supported by the European Crop
Protection ASS. (ECPA)



VIDECENTRET FOR LANDBRUG



» [Offline Version Download \(zip-file\)](#)

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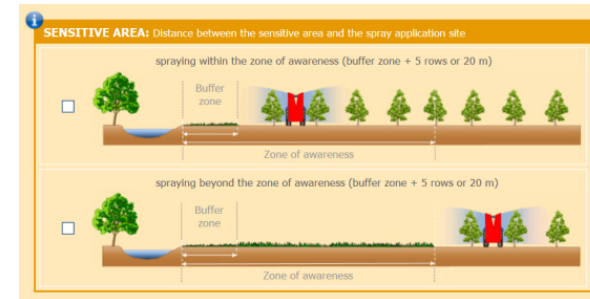


Factors influencing risk of water contamination

I. APPLICATION SITE

proximity to water

LOCATION



II. METEO & FIELD CONDITIONS

uncontrollable factors

SITUATION

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| 1 WIND: Direction <input type="checkbox"/> TOWARDS sensitive area <input type="checkbox"/> PARALLEL to sensitive area <input type="checkbox"/> AWAY FROM the sensitive area | 1 AIR: Temperature <input type="checkbox"/> < 15°C <input type="checkbox"/> 15 - 25°C <input type="checkbox"/> > 25°C | 1 CROP: Canopy density <input type="checkbox"/> 10% <input type="checkbox"/> 25% <input type="checkbox"/> 50% <input type="checkbox"/> 75% <input type="checkbox"/> 90% |
| 1 WIND: Velocity <input type="checkbox"/> CALM < 0,5 m/s <input type="checkbox"/> LOW 0,5 - 1,5 m/s <input type="checkbox"/> MEDIUM 1,6 - 3,0 m/s <input type="checkbox"/> HIGH 3,1 - 4,0 m/s <input type="checkbox"/> VERY HIGH > 4,0 m/s | 1 AIR: Humidity <input type="checkbox"/> < 40% <input type="checkbox"/> 40 - 60% <input type="checkbox"/> > 60% | 1 ORCHARD: Adjacent structure <input type="checkbox"/> BARE GROUND <input type="checkbox"/> MEADOW <input type="checkbox"/> HIGH VEGETATION, WINDBREAK <input type="checkbox"/> HAILNET |

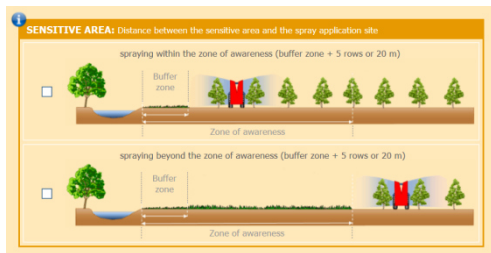
15 CLICKS

III. EQUIPMENT & METHODS

operator dependent factors

MITIGATION

| | | | |
|--|--|--|--|
| 1 DRIFT REDUCTION TECHNOLOGY CLASSIFICATION: <input type="checkbox"/> NO CLASSIFICATION <input type="checkbox"/> 25 % <input type="checkbox"/> 50 % <input type="checkbox"/> 75 % <input type="checkbox"/> 90 % <input type="checkbox"/> 95 % <input type="checkbox"/> 99 % <input type="checkbox"/> other: % | 1 APPLICATION PARAMETERS: Driving velocity <input type="checkbox"/> 3 - 4,5 km/h <input type="checkbox"/> 4,6 - 6 km/h <input type="checkbox"/> 6,1 - 8 km/h <input type="checkbox"/> > 8 km/h | 1 SPRAYER ADJUSTMENT: Spray output adjustment <input type="checkbox"/> No special adjustment <input type="checkbox"/> Number of nozzles visually adjusted to crop height <input type="checkbox"/> Above = output of nozzles visually adjusted to tree height <input type="checkbox"/> Spray range and distribution adjusted by sprayer test service | 1 SPRAYER ADJUSTMENT: Air flow adjustment <input type="checkbox"/> No special adjustment <input type="checkbox"/> Airflow velocity visually adjusted to crop density <input type="checkbox"/> Above = air direction/deflection visually adjusted to crop density <input type="checkbox"/> Airflow velocity and direction adjusted by sprayer test service |
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LOCATION

I. APPLICATION SITE

Proximity to water

Standard situation:

Wind: 3-4 m/s

Temperature: 15-25 °C

Humidity: 40-60%

Nozzles: Hollow-cone

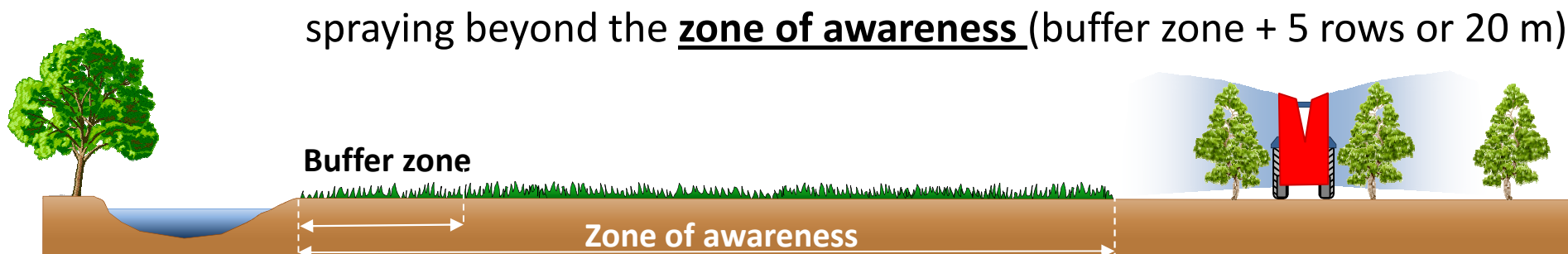
Pressure: >10 bar

Sprayer: Radial flow

Driving velocity 6-8 km/h



spraying within the zone of awareness (buffer zone + 5 rows or 20 m)



spraying beyond the zone of awareness (buffer zone + 5 rows or 20 m)

| | | |
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II. METEO & FIELD CONDITIONS

Uncontrollable factors



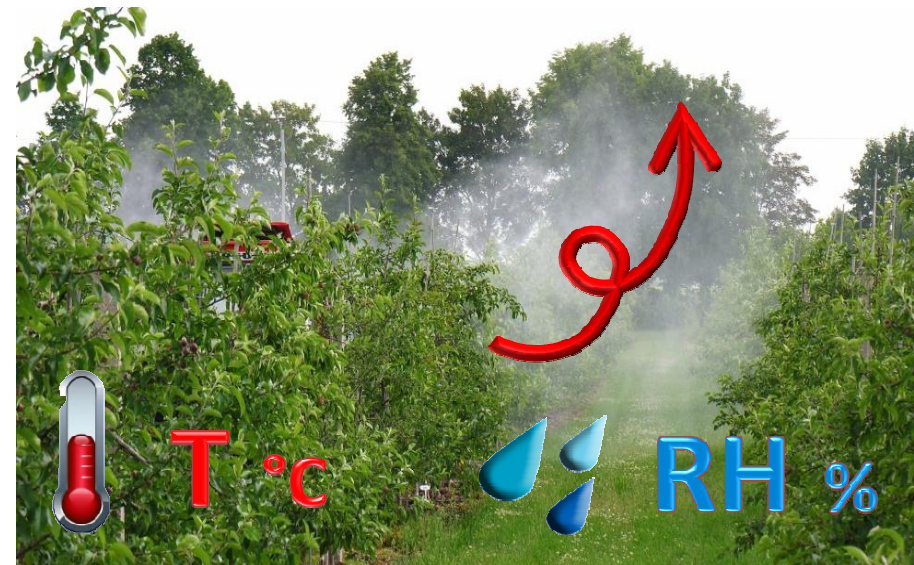
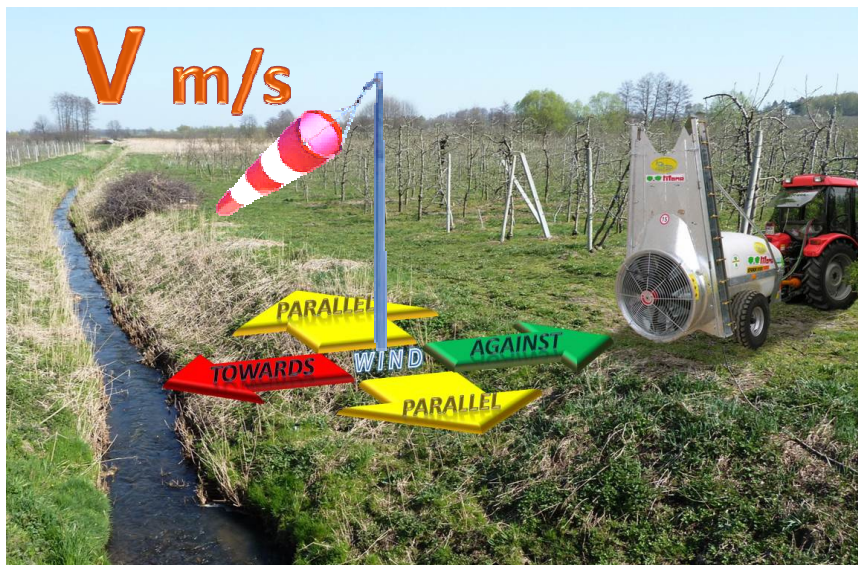
SITUATION

WIND

- direction
- velocity

AIR

- temperature
- relative humidity



| | | |
|--|---|---|
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II. METEO & FIELD CONDITIONS

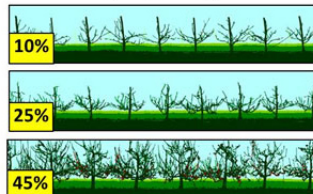
Uncontrollable factors

SITUATION

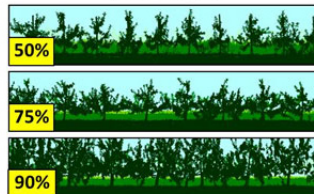
- crop density
- adjacent structures



Early stage



Late stage



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|--|---|--|
| WIND: Direction <input type="checkbox"/> TOWARDS sensitive area <input type="checkbox"/> PARALLEL to sensitive area <input type="checkbox"/> AWAY FROM the sensitive area | AIR: Temperature <input type="checkbox"/> < 15°C <input type="checkbox"/> 15 - 25°C <input type="checkbox"/> > 25°C | CROP: Canopy density <input type="checkbox"/> 10% <input type="checkbox"/> 25% <input type="checkbox"/> 50% <input type="checkbox"/> 75% <input type="checkbox"/> 90% |
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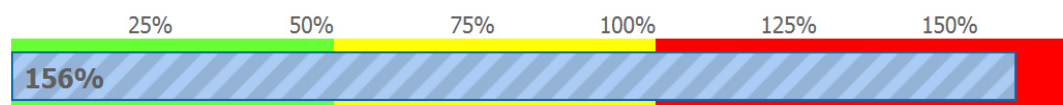
Uncontrollable factors

SITUATION

RESULTS

Drift Risk Value

Field & Weather Situation 

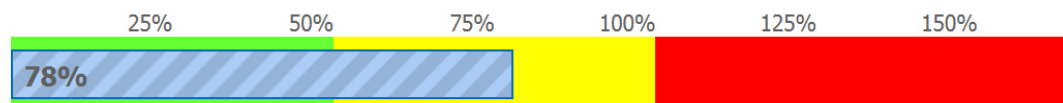


RECOMMENDATION

HIGH risk of spray drift. Do not spray unless SDRT is used and /or drift reducing application parameters are set. Follow the local regulations and the label recommendations for buffer zones

Drift Risk Value

Field & Weather Situation 

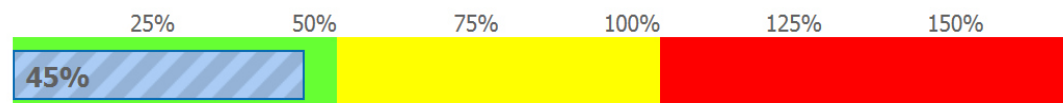


RECOMMENDATION

MEDIUM risk of water contamination by drift. Consider using SDRT and/or setting drift reducing application parameters. Follow the local regulations and the label recommendations for buffer zones

Drift Risk Value

Field & Weather Situation 



RECOMMENDATION

LOW risk of spray drift. During spray application periodically check the meteorological conditions and in case of unfavourable weather change, apply the drift mitigation measures. Follow the local regulations and the label recommendations for buffer zones

| DRIFT REDUCTION TECHNOLOGY CLASSIFICATION | APPLICATION PARAMETERS: Driving velocity | SPRAYER ADJUSTMENT: Spray output adjustment | SPRAYER ADJUSTMENT: Air-flow adjustment |
|--|---|---|--|
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III. EQUIPMENT & METHODS

Operator dependent factors

SPRAY DRIFT REDUCTION TECHNOLOGY (SDRT)

(combination of nozzles application parameters and scenarios)

MITIGATION



| | | | |
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III. EQUIPMENT & METHODS

Operator dependent factors

SPRAYER ADJUSTMENTS

- driving velocity

MITIGATION



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MITIGATION

III. EQUIPMENT & METHODS

Operator dependent factors

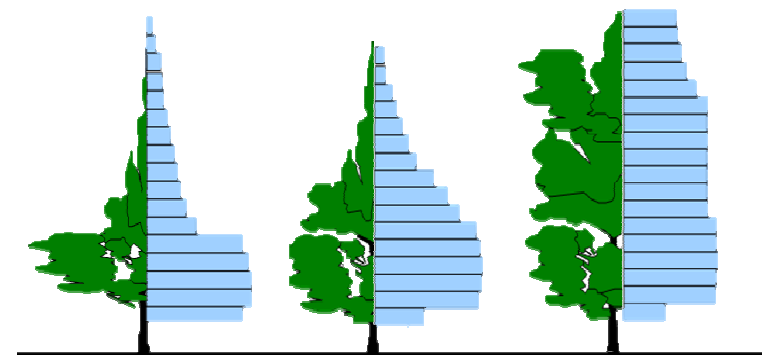
SPRAYER ADJUSTMENTS

- spray flow adjustment



NUMBER of NOZZLES

NOZZLE FLOWRATE



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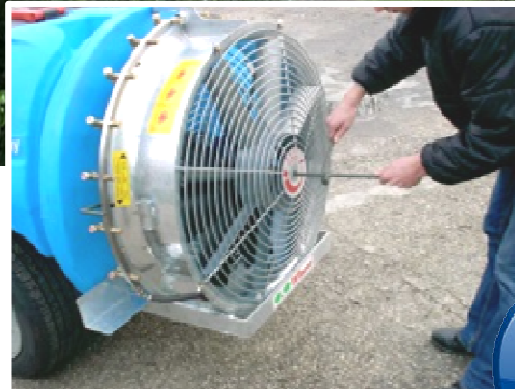
III. EQUIPMENT & METHODS

Operator dependent factors

SPRAYER ADJUSTMENTS

- air flow adjustment

MITIGATION



AIR VOLUME

AIR DIRECTION

III. EQUIPMENT & METHODS

Operator dependent factors

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MITIGATION

AXIAL FLOW



CROS-FLOW



MULTI-SPOUT



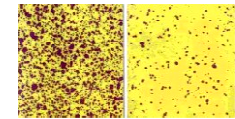
TUNNEL
REFLECTION
RECYCLING



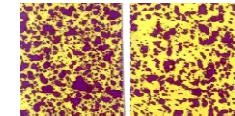
- sprayer type

- nozzle type

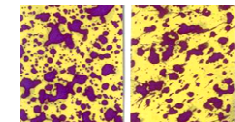
HOLLOW CONE



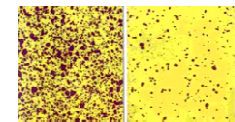
AIR-INDUCTION
HOLLOW CONE



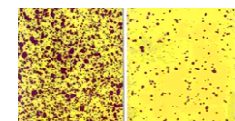
AIR-INDUCTION
FLAT-FAN



PNEUMATIC



FLAT-FAN



| | | | |
|--|--|---|--|
| DRIFT REDUCTION TECHNOLOGY CLASSIFICATION: <input type="checkbox"/> NO CLASSIFICATION <input type="checkbox"/> 25 % <input type="checkbox"/> 50 % <input type="checkbox"/> 75 % <input type="checkbox"/> 90 % <input type="checkbox"/> 95 % <input type="checkbox"/> 99 % <input type="checkbox"/> other: % | APPLICATION PARAMETERS: Driving velocity <input type="checkbox"/> 3 - 4.5 km/h <input type="checkbox"/> 4.6 - 6 km/h <input type="checkbox"/> 6.1 - 8 km/h <input type="checkbox"/> > 8 km/h | SPRAYER ADJUSTMENT: Spray output adjustment <input type="checkbox"/> No special adjustment <input type="checkbox"/> Number of nozzles visually adjusted to crop height <input type="checkbox"/> Above + output of nozzles visually adjusted to tree height <input type="checkbox"/> Spray range and direction adjusted by sprayer test service | SPRAYER ADJUSTMENT: Air-flow adjustment <input type="checkbox"/> No special adjustment <input type="checkbox"/> Airflow velocity visually adjusted to crop density <input type="checkbox"/> Above + air direction deflection visually adjusted to crop density <input type="checkbox"/> Airflow velocity and direction adjusted by sprayer test service |
| APPLICATION METHOD: Sprayer type <input type="checkbox"/> AXIAL FLOW <input type="checkbox"/> CROSS FLOW <input type="checkbox"/> MULTI-SHOOT <input type="checkbox"/> TUNNEL / INTERSECTION / RECYCLING | APPLICATION METHOD: Nozzle type & pressure <input type="checkbox"/> HOLLOW CONE @ < 10 bar <input type="checkbox"/> HOLLOW CONE @ > 10 bar <input type="checkbox"/> AIR-IND. HOLLOW CONE @ < 10 bar <input type="checkbox"/> AIR-IND. HOLLOW CONE @ > 10 bar <input type="checkbox"/> AIR-IND. FLAT FAN @ < 10 bar <input type="checkbox"/> AIR-IND. FLAT FAN @ > 10 bar <input type="checkbox"/> PNEUMATIC ATOMIZER <input type="checkbox"/> FLAT FAN @ < 10 bar <input type="checkbox"/> FLAT FAN @ > 10 bar | APPLICATION SCENARIO: Spray scenario <input type="checkbox"/> SPRAYING ON BOTH SIDES of TREE ROWS <input type="checkbox"/> SPRAYING ON OUTER SIDE of ROW 1 <input type="checkbox"/> SPRAYING ON OUTER SIDES of ROWS 1+2 <input type="checkbox"/> SPRAYING ON OUTER SIDES of ROWS 1+2+3 | APPLICATION SCENARIO: Air-flow scenario <input type="checkbox"/> BLOWING ON BOTH SIDES of TREE ROWS <input type="checkbox"/> BLOWING ON OUTER SIDE of ROW 1 <input type="checkbox"/> BLOWING ON OUTER SIDES of ROWS 1+2 <input type="checkbox"/> BLOWING ON OUTER SIDES of ROWS 1+2+3 |

MITIGATION

III. EQUIPMENT & METHODS

Operator dependent factors

APPLICATION SCENARIO
(altering application parameters when approaching water)



- spray scenario



- air-flow scenario



| | | | |
|--|--|---|--|
| DRIFT REDUCTION TECHNOLOGY CLASSIFICATION: <input type="checkbox"/> NO CLASSIFICATION <input type="checkbox"/> 25 % <input type="checkbox"/> 50 % <input type="checkbox"/> 75 % <input type="checkbox"/> 90 % <input type="checkbox"/> 95 % <input type="checkbox"/> 99 % <input type="checkbox"/> other: % | APPLICATION PARAMETERS: Driving velocity <input type="checkbox"/> 3 - 4.5 km/h <input type="checkbox"/> 4.6 - 6 km/h <input type="checkbox"/> 6.1 - 8 km/h <input type="checkbox"/> > 8 km/h | SPRAYER ADJUSTMENT: Spray output adjustment <input type="checkbox"/> No special adjustment <input type="checkbox"/> Number of nozzles visually adjusted to crop height <input type="checkbox"/> Above = output of nozzles visually adjusted to tree height <input type="checkbox"/> Spray range and direction adjusted by sprayer test service | SPRAYER ADJUSTMENT: Air-flow adjustment <input type="checkbox"/> No special adjustment <input type="checkbox"/> Airflow velocity visually adjusted to crop density <input type="checkbox"/> Above = air direction deflection visually adjusted to crop density <input type="checkbox"/> Airflow velocity and direction adjusted by sprayer test service |
| APPLICATION METHOD: Sprayer type <input type="checkbox"/> AXIAL FLOW <input type="checkbox"/> CROSS FLOW <input type="checkbox"/> MULTI-SHOOT <input type="checkbox"/> TURNER / INJECTION / RECYCLING | APPLICATION METHOD: Nozzle type & pressure <input type="checkbox"/> HOLLOW CONE @ < 10 bar <input type="checkbox"/> HOLLOW CONE @ > 10 bar <input type="checkbox"/> AIR-IND. HOLLOW CONE @ < 10 bar <input type="checkbox"/> AIR-IND. HOLLOW CONE @ > 10 bar <input type="checkbox"/> AIR-IND. FLAT FAN @ < 10 bar <input type="checkbox"/> AIR-IND. FLAT FAN @ > 10 bar <input type="checkbox"/> PNEUMATIC ATOMISER <input type="checkbox"/> FLAT FAN @ < 10 bars <input type="checkbox"/> FLAT FAN @ > 10 bars | APPLICATION SCENARIO: Spray scenario <input type="checkbox"/> SPRAYING ON BOTH SIDES OF TREE ROWS <input type="checkbox"/> SPRAYING ON OUTER SIDE OF ROW 1 <input type="checkbox"/> SPRAYING ON OUTER SIDES OF ROWS 1+2 <input type="checkbox"/> SPRAYING ON OUTER SIDES OF ROWS 1+2+3 | APPLICATION SCENARIO: Air-flow scenario <input type="checkbox"/> BLOWING ON BOTH SIDES OF TREE ROWS <input type="checkbox"/> BLOWING ON OUTER SIDE OF ROW 1 <input type="checkbox"/> BLOWING ON OUTER SIDES OF ROWS 1+2 <input type="checkbox"/> BLOWING ON OUTER SIDES OF ROWS 1+2+3 |

III. EQUIPMENT & METHODS

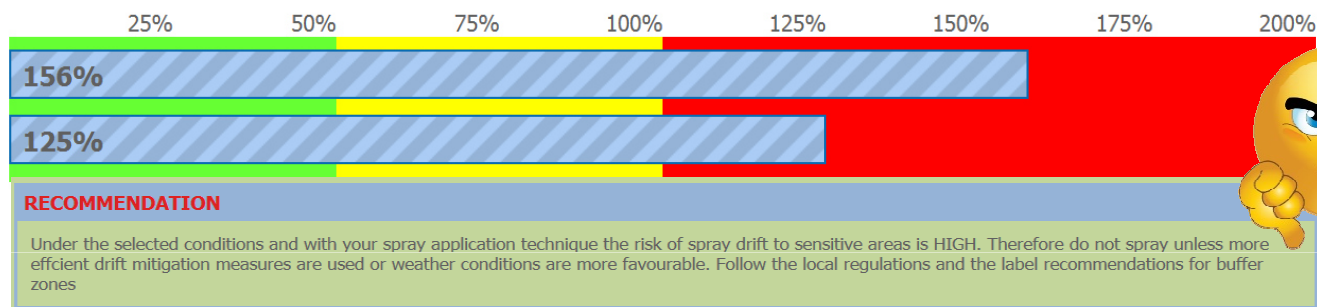
Operator dependent factors

RESULTS

Drift Risk Value

Field & Weather Situation 

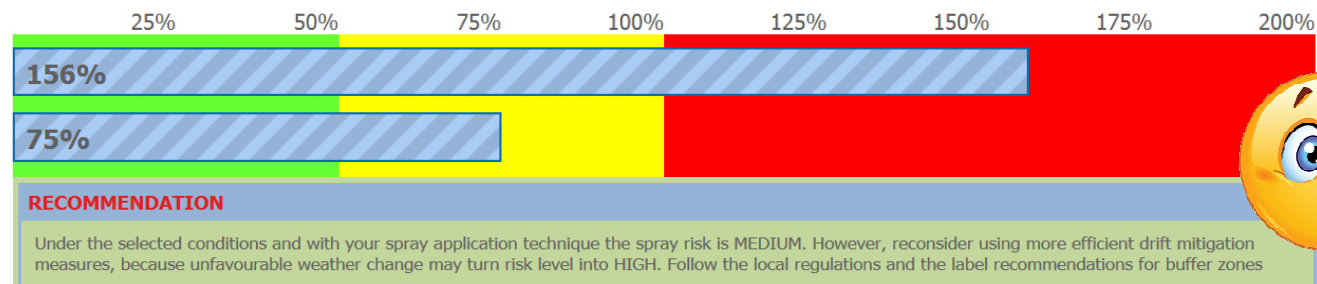
Application Situation 



Drift Risk Value

Field & Weather Situation 

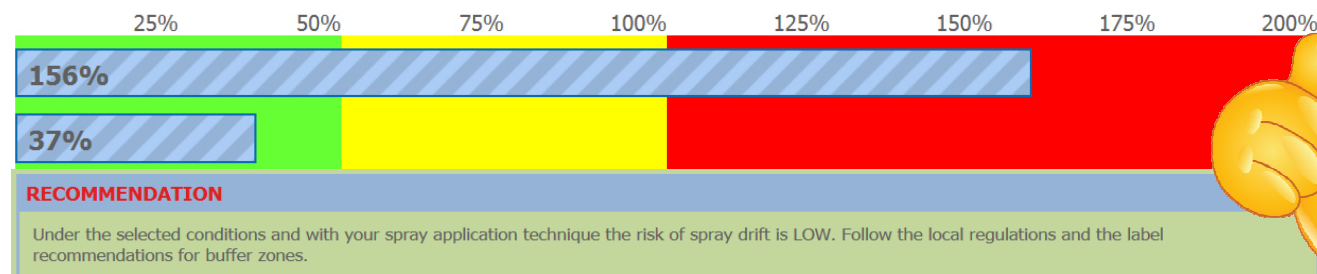
Application Situation 



Drift Risk Value

Field & Weather Situation 

Application Situation 





DET application

POTENTIAL USERS:

- applicators
- advisors
- trainers
- teachers
- students



*Thank you
and
enjoy using DET application ;-)*



<http://www.topps-drift.org/>