Helicopter Drift Trials in Germany

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Introduction

- Exposure assessment in the authorization procedure for plant protection products is based in the first instance on the maximum application rate and the German drift values

- Basic Drift Values are available for
  - field crops
  - fruit crops
  - grapevine
  - hops
  - ornamental plants

- Basic Drift Values are valid for ground application but not for aerial application
Drift Values for Aerial Application

- In Germany aerial application is used in vineyards with steep slopes and in forests
- Aerial application techniques have changed in the last years (air induction nozzles)
- No Basic Drift Values are available
- Drift trials are necessary to develop Basic Drift Values
Aerial spraying in Vineyards in steep slopes

Application Techniques changed

Hollow cone nozzles until 2001
Low Drift Air Induction Nozzles since 2002
Drift trials in vineyards

• 10 Trials in early growth stages (no leaves)
• 8 Trials in late growth stages
• Wind speeds between 2 m/s and 5 m/s
• Hollow cone nozzles (ATR) and air induction nozzles (AirMix)
Drift trials in forests

- Due to the costs trials have to be conducted in combination with real applications
- Applications are not done every year
- It is difficult to find suitable sites for the trials
- Wind speed and wind directions must fit during the application
Aerial spraying in Forests

Results of Drift Trials in Forests with Helicopters 1994 - 2004
Drift results so far

Drift trials in 1994 and 2004 by different institutions showed a high drift potential, when spraying with hollow cone nozzles.

Buffer zones and air induction nozzles resulted in a significant drift reduction.

More trials are necessary to get reliable data.
Drift trials in forests 2008 – Layout plan

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Trial arrangement for drift measurements in forests

Treated forest

Measuring area

Layout following ISO 22866 – Equipment for crop protection – Methods for field Measurements of spray drift

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Drift trials in 2008

Forest sprayed to the edge

6 trials

Nozzles: AirMix 110 05
Spray pressure: 2.5 bar
Speed: 70 km/h
Swath width: 15 m
Width of treated area: 90 m

Results

Drift reduction of more than 90 % compared to applications with hollow cone nozzles

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Trial arrangement for drift measurements in forests

Treated forest | Untreated forest | Measuring area

Layout following ISO 22866 – Equipment for crop protection – Methods for field Measurements of spray drift

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Drift trials in 2008

Trials with a 50 m buffer zone

3 trials

Nozzles: AirMix 110 05
Spray pressure: 2.5 bar
Speed: 70 km/h
Swath width: 15 m
Width of treated area: 90 m

Results

Drift reduction of more than 99 % compared to applications with hollow cone nozzles without a buffer zone.
Conclusion

- With low drift nozzles it is possible to reduce spray drift significantly.
- The drift level can be reduced to the drift level of ground equipment.
Thank you for your attention

Dirk Rademann, Institute for Application Techniques in Plant Protection
Why Aerial Spraying?

Keith A. Jones
RRSG Seminar, San Francisco, February 2009

What is a Sprayer for?

Atomize the pesticide
Regulate the flow
Safeguard operator
Deliver it to the target
(Safely, Effectively)
Spraying Platforms

Portable (hand-held and backpack)

Tractor-mounted  Sprayer  Aircraft-mounted

Other vehicle-mounted

Why Aerial?

- Scale
- Urgency
- Access
- Cost
Scale

- Large Areas
  - Soybean
  - Cotton
  - Forests, Trees
  - Sugar Cane
  - ........
Scale

Urgency

- Prevent total crop destruction
  - Locust Outbreak
- Disease Outbreak
  - Malaria Control
Accessibility

- Vector Control
- Locust Control
- Forests
- Sugar Cane
- Difficult Terrain
  - Bananas
  - Palm
  - ........
Accessibility

Accessibility
Accessibility

Cost

All of the Above!
Safety

All of the Above!

Minimising Risk

Track navigation – the old way
Track navigation the new way – Global Positioning Systems

GPS can...

• lay out accurate spray tracks on a display
• show position of aircraft
• guide the pilot along the tracks
Modelling the deposit with Agdrift

Summary

- Aerial Spraying is only viable option in specific circumstances
  - Scale
  - Urgency
  - Access
  - Cost
- Safest option under these circumstances
- Technological developments reduces risk
Thank you