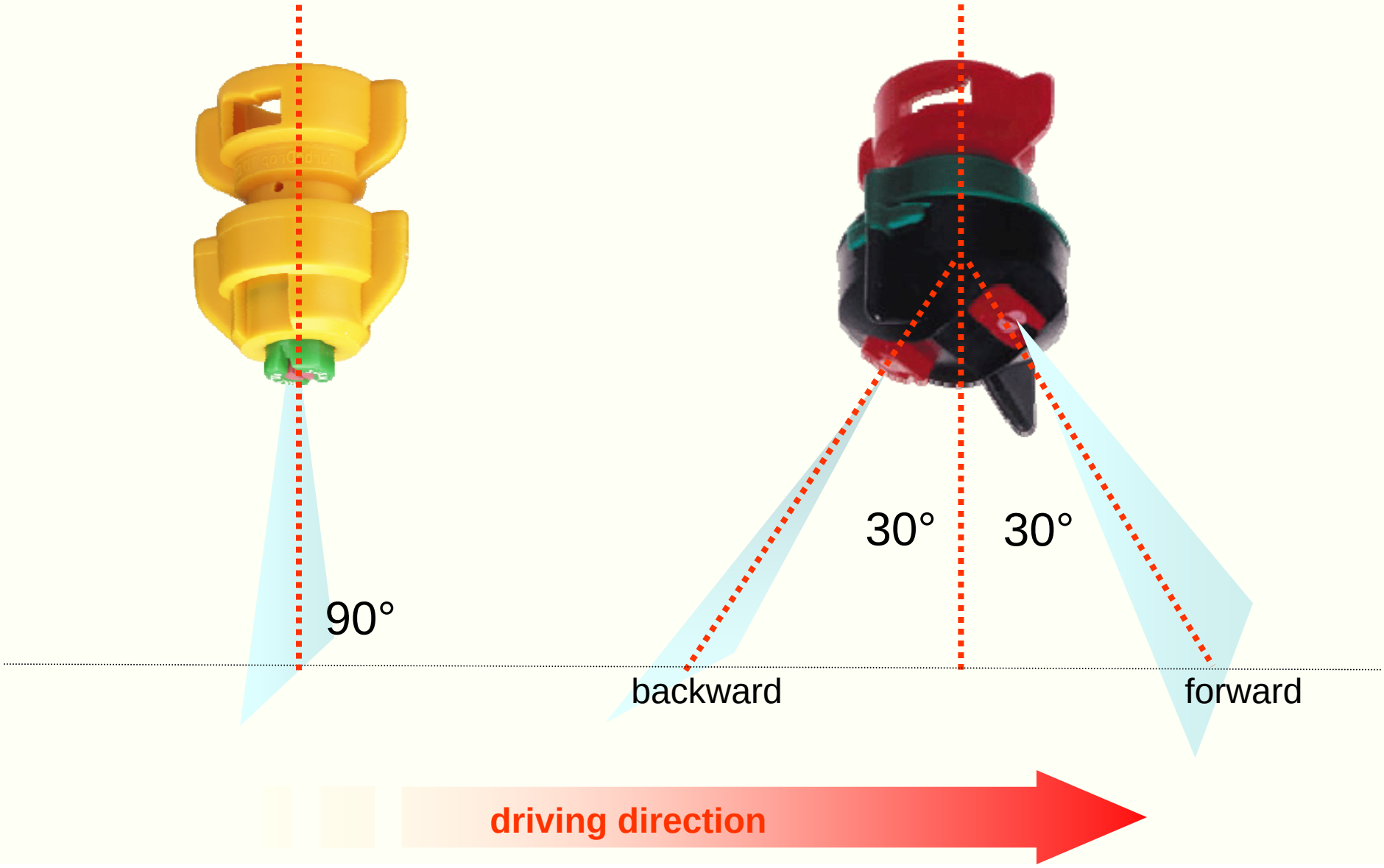
Double Flat Fan Venturi Nozzles from agrotop

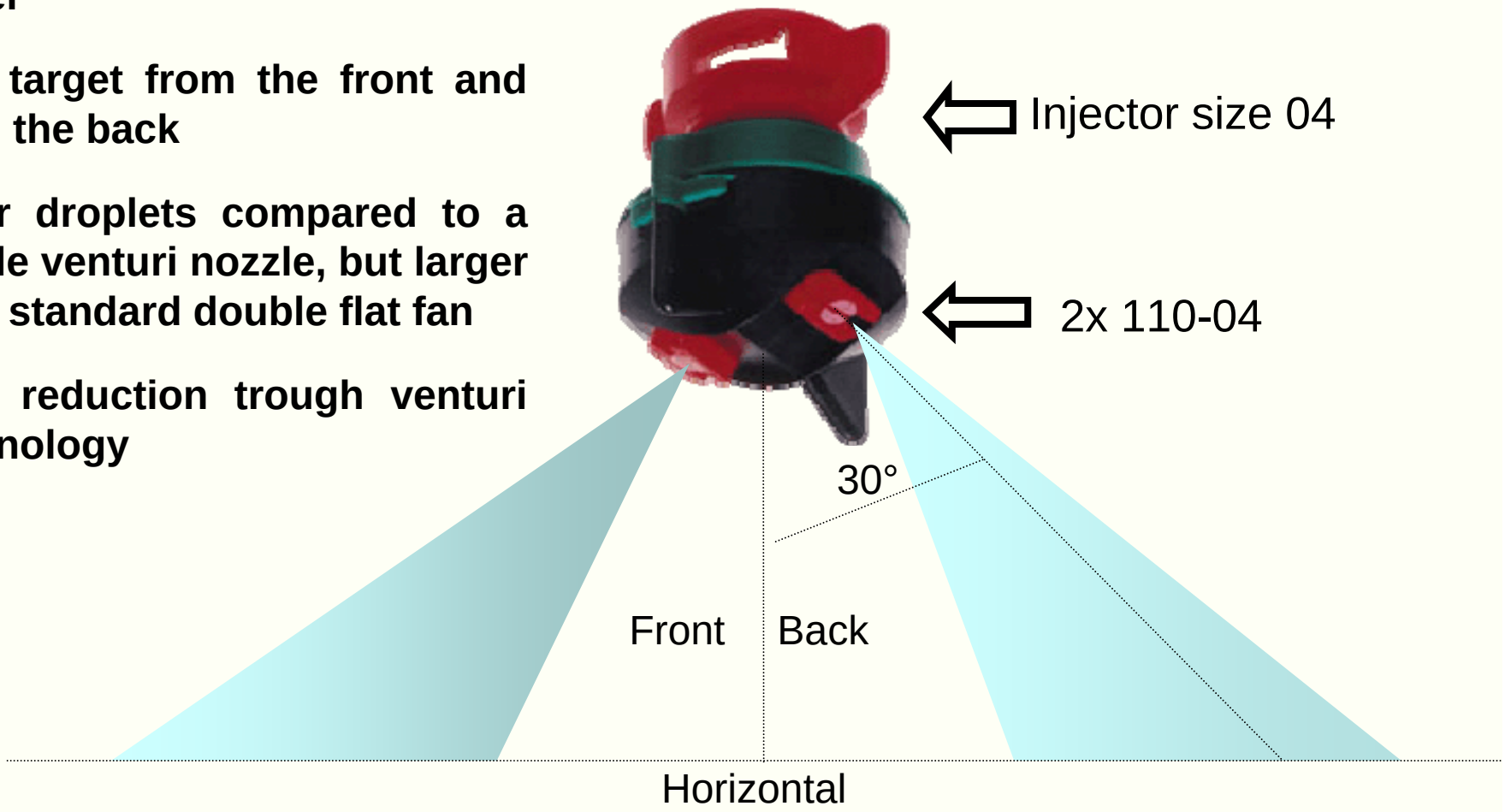

Optimising coverage
using double flat fan
venturi nozzles

Orientation of spray pattern for standard flat fan and double flat fan nozzles



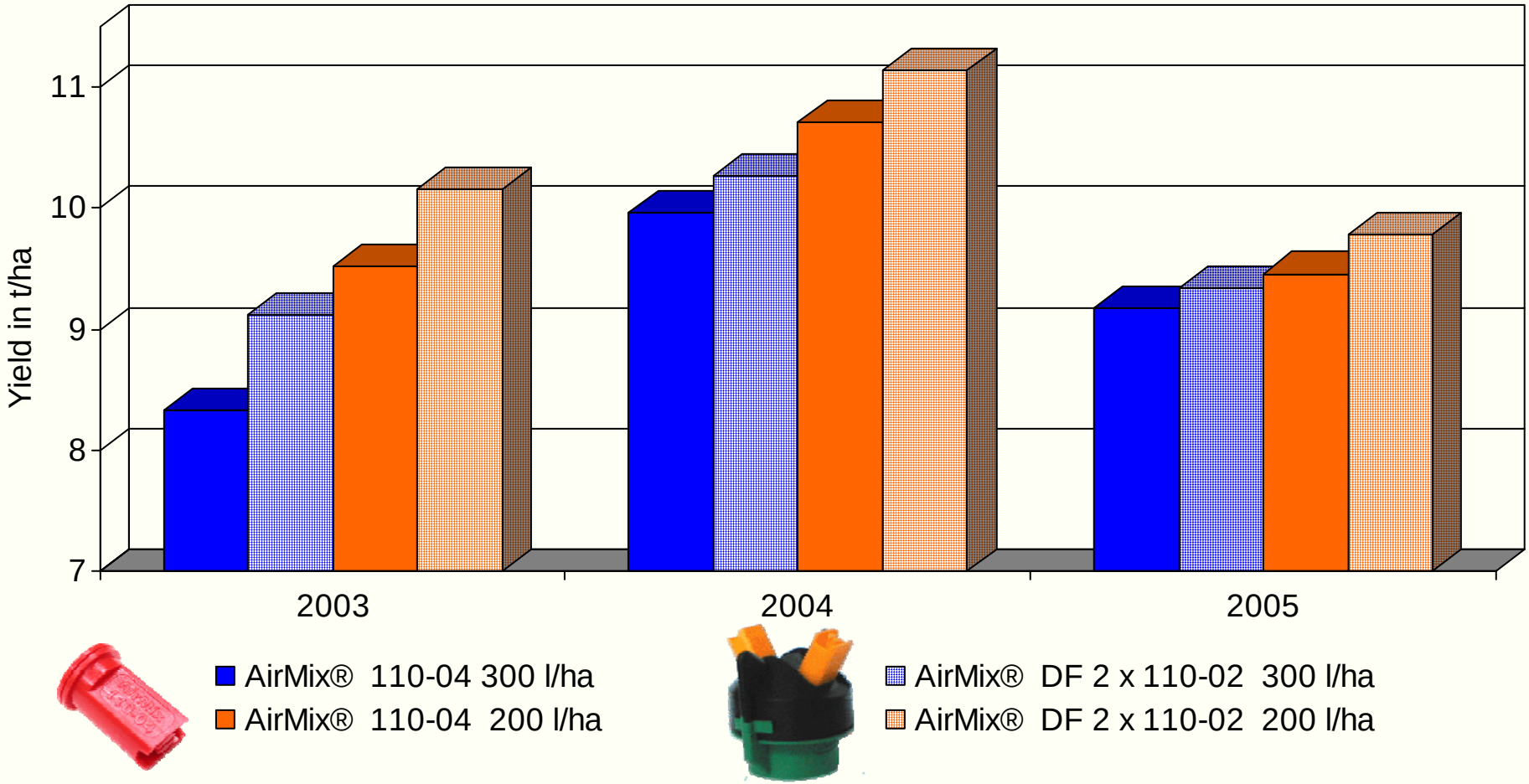
Technical differences of a TurboDrop double flat fan venturi nozzles

- **30° forward and backward angel**
- **Hits target from the front and from the back**
- **Finer droplets compared to a single venturi nozzle, but larger than standard double flat fan**
- **Drift reduction trough venturi technology**



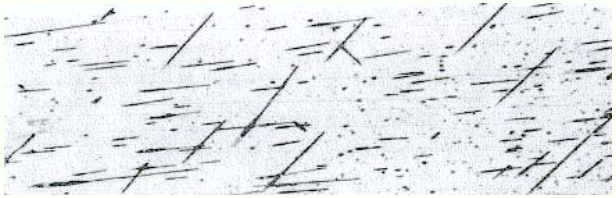
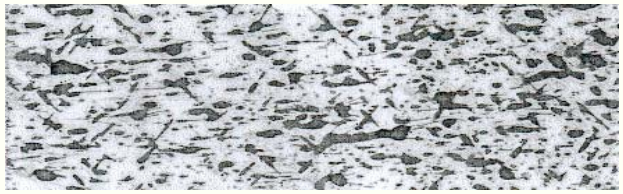
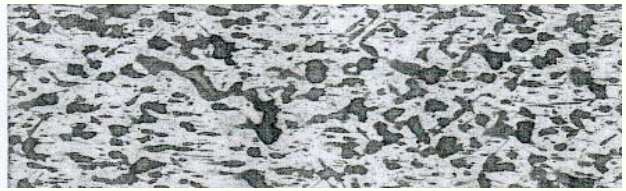
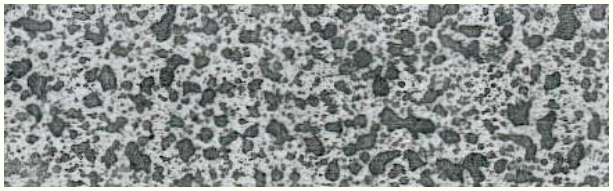
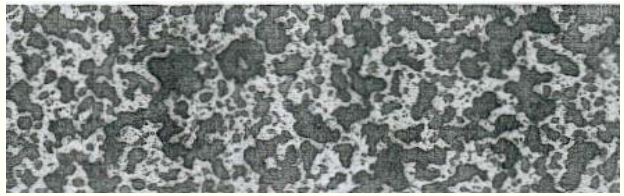
Comparison of different application technologies for fungicide applications in winter wheat (yield in t/ha).

AirMix® venturi nozzle as a single nozzle compared to 2x AirMix® in a double flat fan cap (DF) creating two angled sprays (forward und backward), at two different application rates.



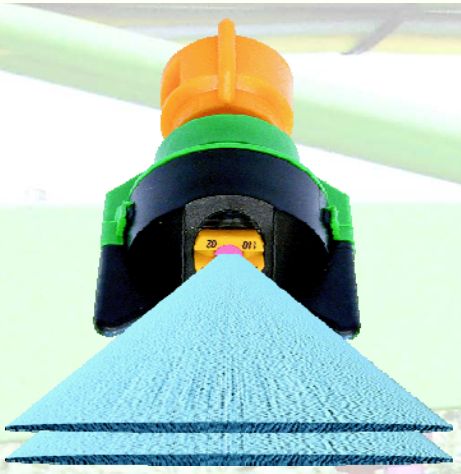
Source: Bayerische Landesanstalt für Landwirtschaft 2005.

Effect of TDDF on coverage

	Standard Nozzle 110-05 300 l/ha; 6,5 km/h; 2,0 bar; VMD 330µm	**TurboDrop® DF** 550 l/ha; 5 km/h; 6 bar; VMD 420µm
Vertical front		
Vertical back		
Horizontal		

Data measured at the DEULA workshop “Current Spray Technologies” in 2001, Freising Germany

Advantages of TurboDrop® and AirMix® Double Flat Fan Venturi Nozzles (DF)



TurboDrop® DF 110- 02

AirMix® DF 2x AirMix 02

Better coverage and **improved** efficacy for:

- Fusarium treatments of ears (contact)
- Potatoes (between leafs specially when crop density is lower)
- Vegetable (anions, leek, etc.)
- Post emergence in sugar beet (weeds “covered” by sugar beet leafs)
- Grass weeds in early development stage (e.g.black grass)
- Ornamental plants

Less penetration in very dense crops compared to a TurboDrop standard flat fan

TurboDrop® HiSpeed

The latest advance in nozzle technology

adriatic

Why fo farmers requires higher application speed?

- **Farm sizes increase every year**

  Need of efficient applications on large areas

- **Optimising application techniques**

  To achieve best chemical performance, application must be done at recommended developing stage of the crop.

  A shorter “time window” requires an increase in the application strength

Successfully applications are guaranteed through:

- effectual coverage
- uniform distribution of spray on crop and target areas respectively
- adequate penetration, if required

Using flat fan nozzles at higher application speeds reduces the:

- crop penetration of the spray
- uniformity of the coverage

Trajectory of droplets of flat fan nozzles

application speed
2,5 m/s = 9 km/h

spray direction
Ø 2,5 m/s (1,9-4,1 m/s)
high variability within
the spray pattern

trajectory of droplets

+ km/h

+ psi

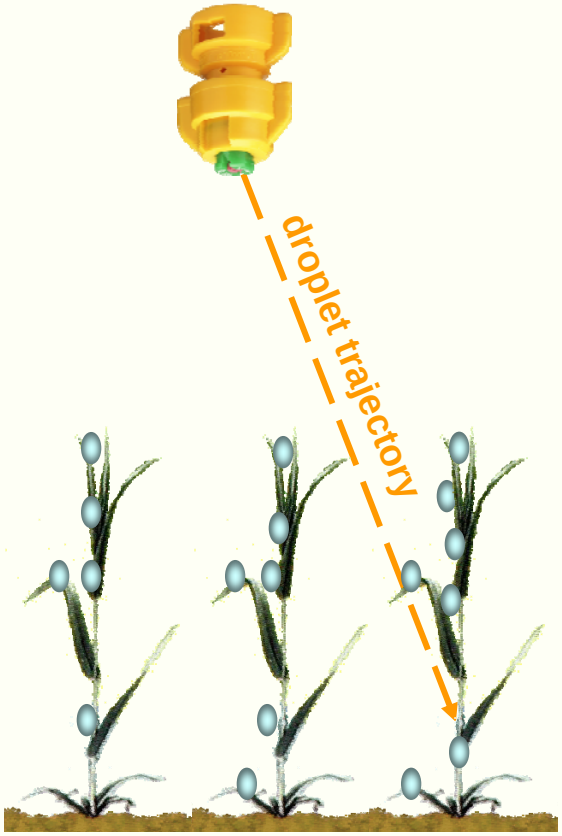
\+ −

"shadow" areas

driving direction

Crop penetration spraying with flat fan nozzles

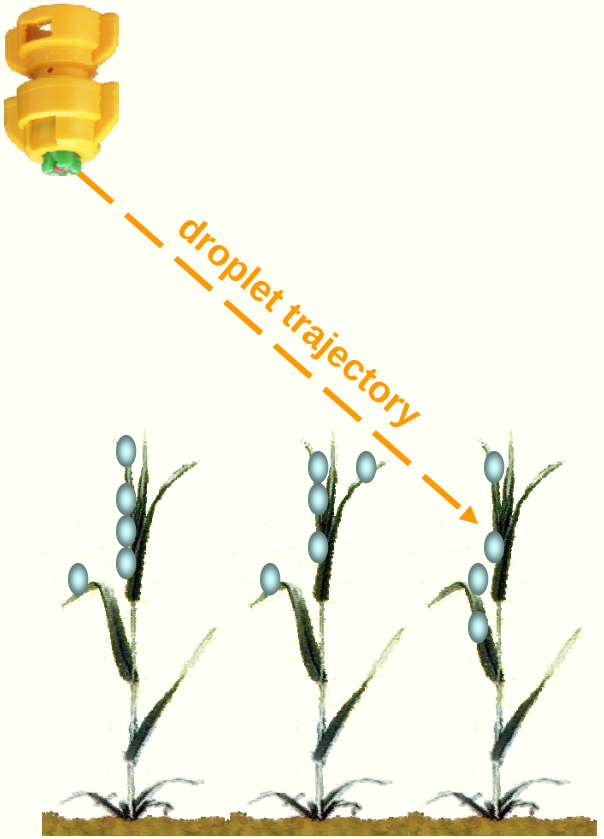
low application speed



small impact angle

better penetration

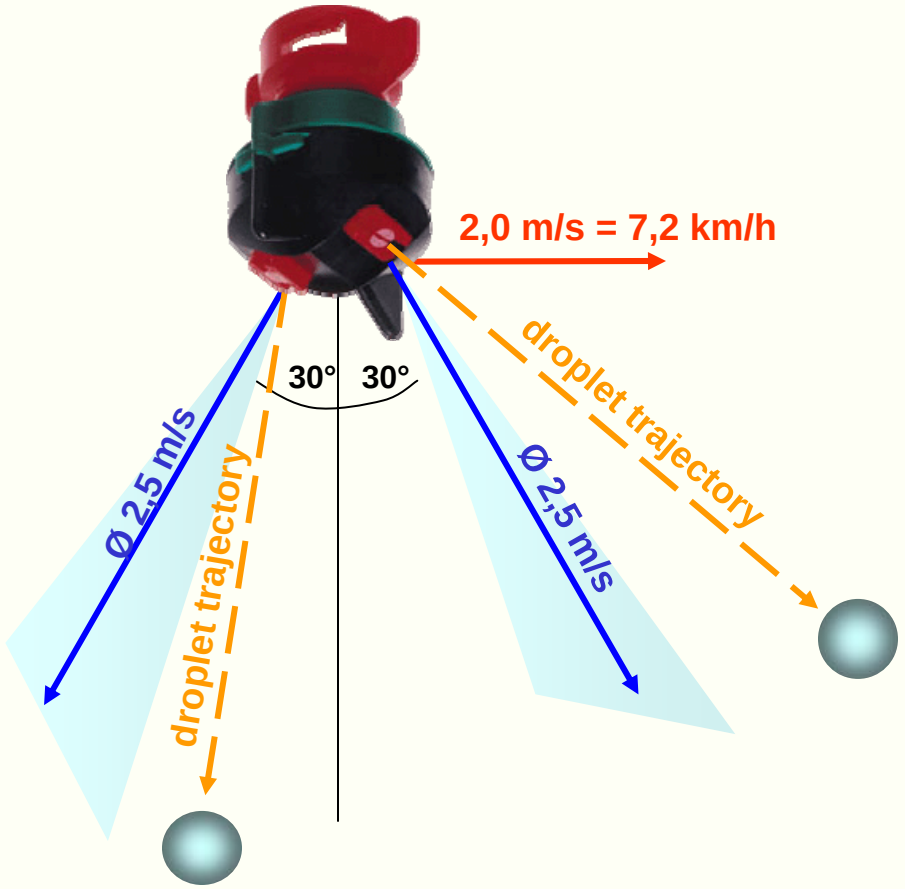
high application speed

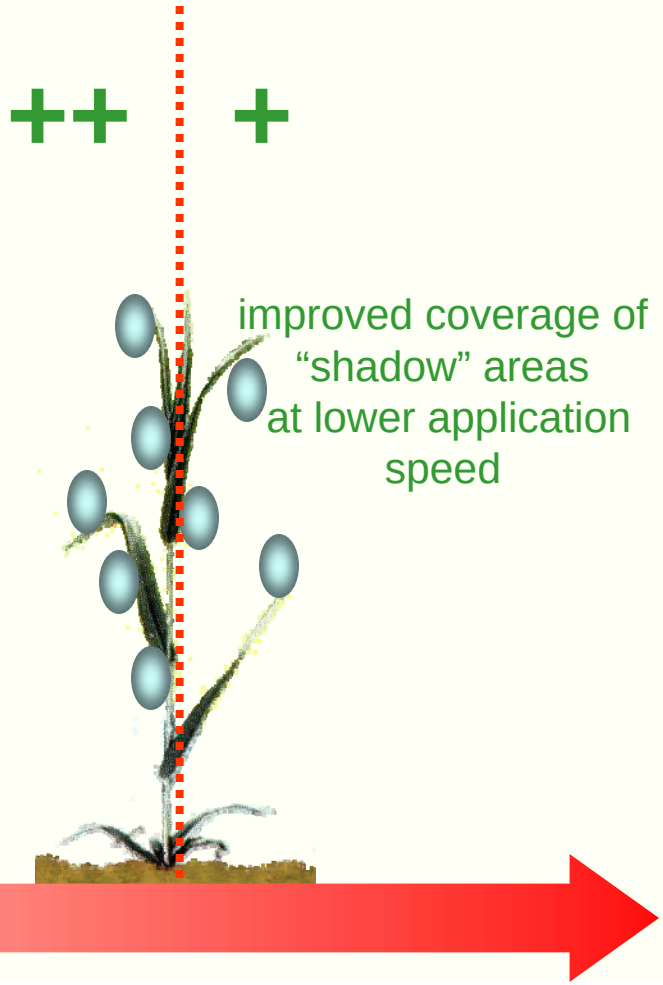


wide impact angle

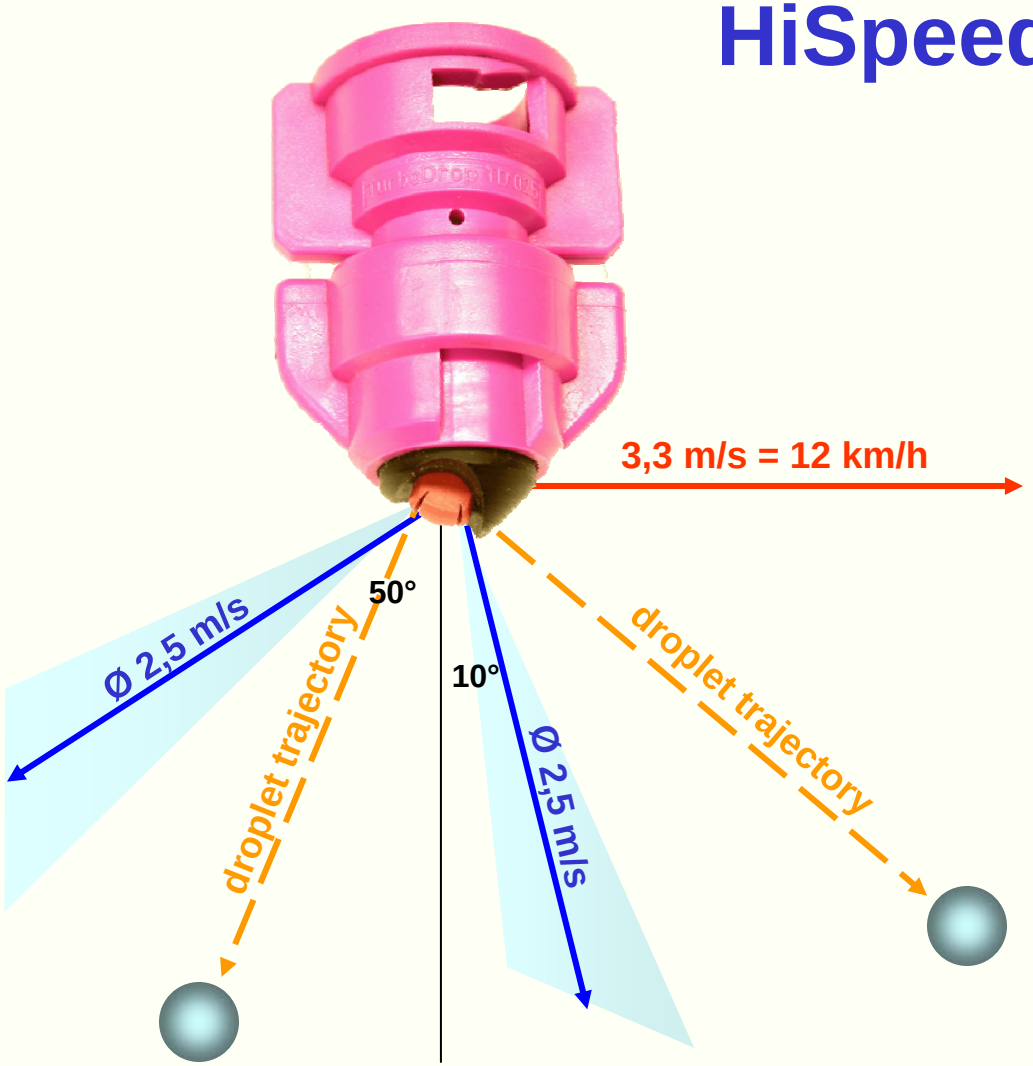
less penetration

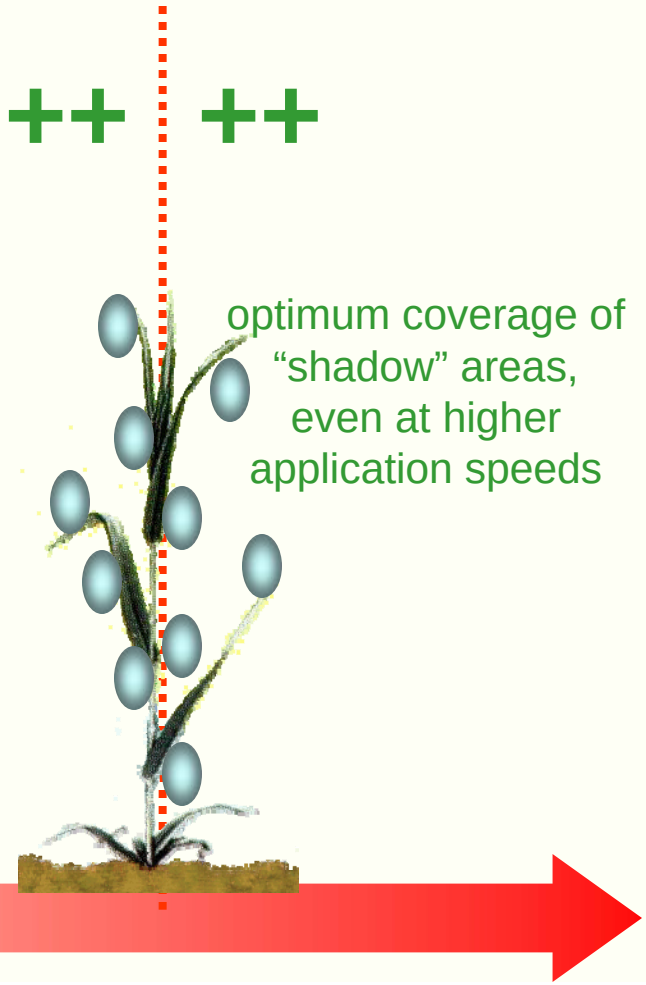
Droplet trajectory of double flat fan nozzles





Droplet trajectory at TurboDrop® HiSpeed





Problems with the uniformity of the coverage at higher application speeds:

- may be resolved partially using double flat fan nozzles with symmetric alignment of the spray patterns, at lower application speed (approx. 7-8 km/h)

- better results can be obtained using double flat fan nozzles with asymmetric alignment of the spray patterns, like the TurboDrop® HiSpeed, specially at higher speeds (approx.16 km/h)

This theory has been validated through:

- the knowledge of using double flat fan nozzles in the field since 1995
- field trial of the “Bayrischen Landesanstalt für Landwirtschaft” from 2003-2005
- a master thesis at the agricultural colleague FH Weihenstephan
- the comparison of the coverage of different nozzle types, spraying under field conditions
- the enthusiastic feedback of users in 2007

TurboDrop® DF
1995

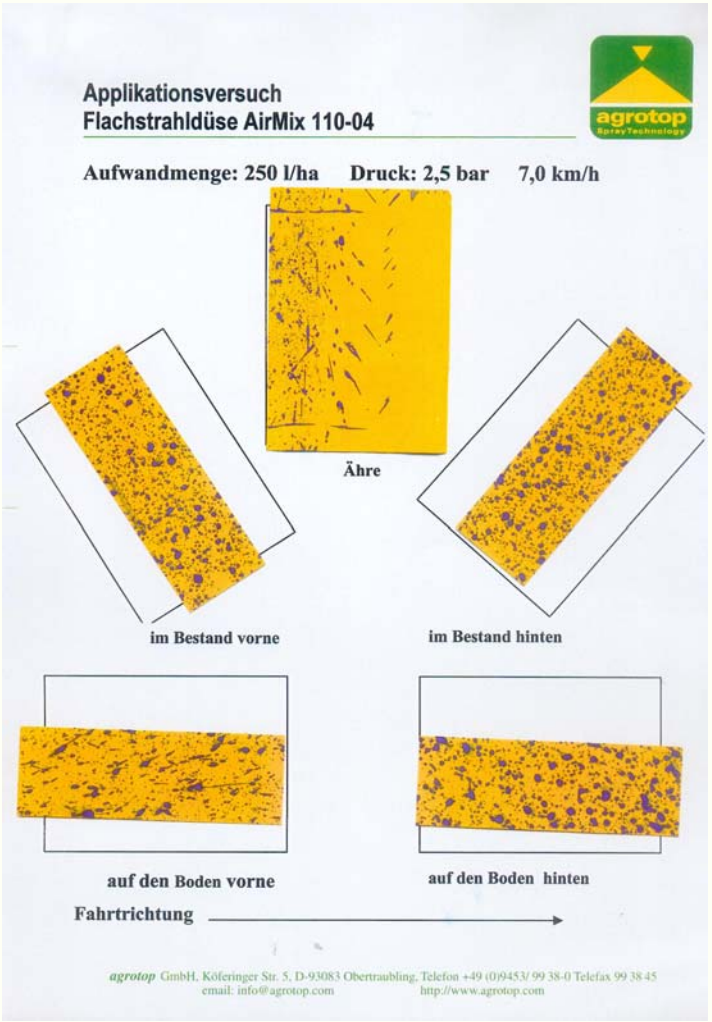
AirMix® DF
2001

TurboDrop® DF
2005 (USA)
wide droplet spectra

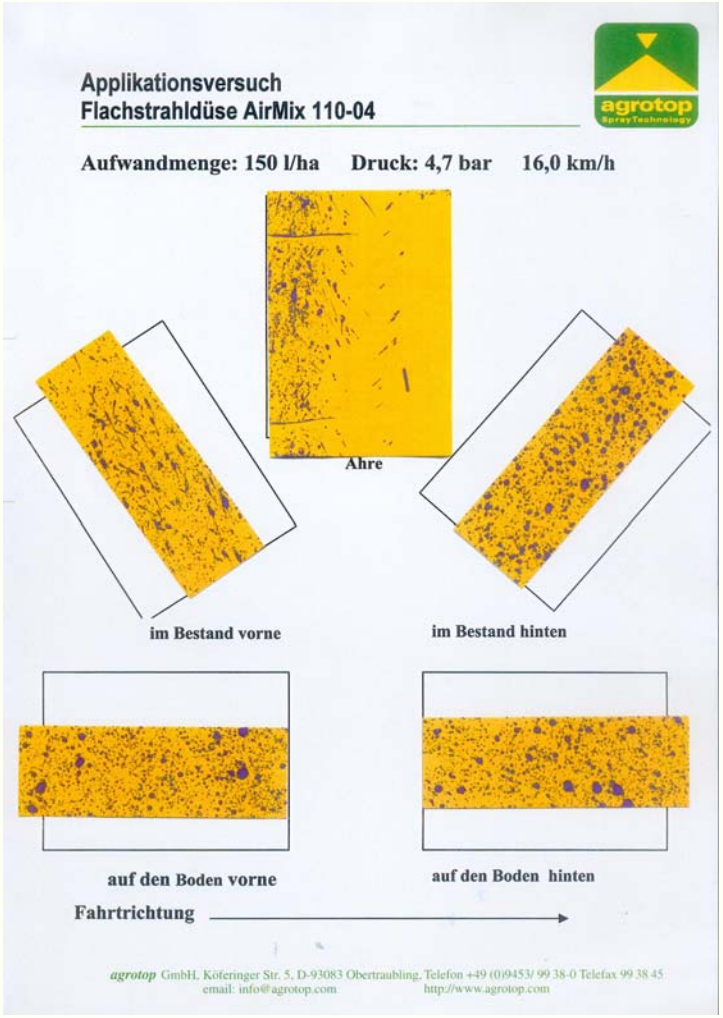
TurboDrop® HiSpeed
2007


Testing coverage using a standardised support for water sensitive paper
agrotop
Spray Technology

Coverage of flat fan nozzles at different application speeds

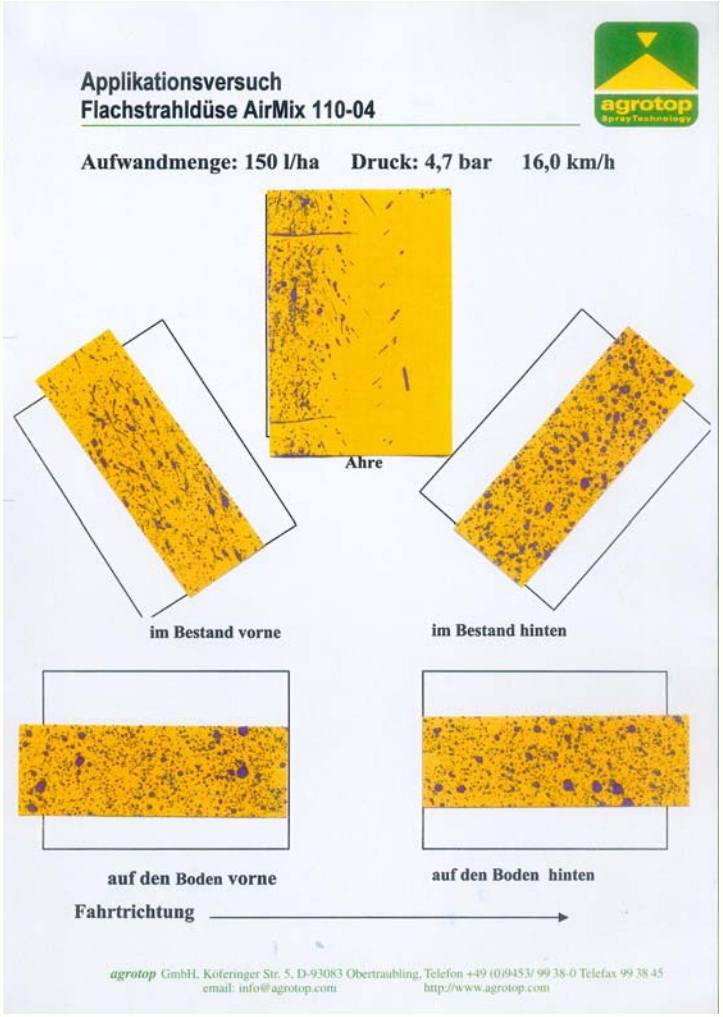


7 km/h

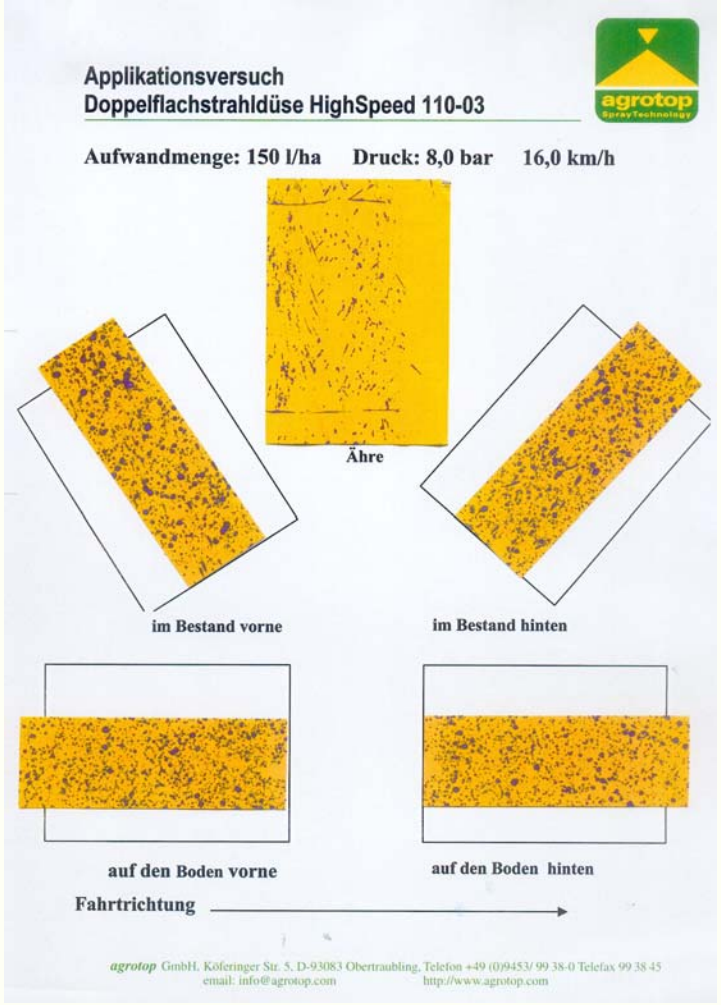


16 km/h

Coverage of flat fan nozzles and und TurboDrop® HiSpeed

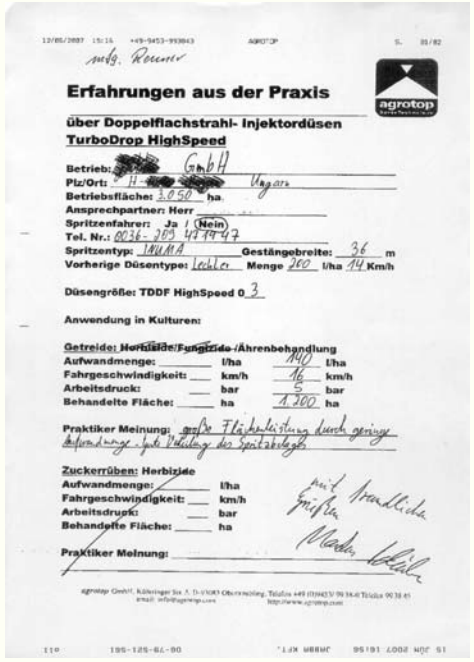


16 km/h



16 km/h

Testimonials using TurboDrop® HiSpeed



Erfahrungen aus der Praxis

über Doppelflachstrahl- Injektordüsen
TurboDrop HighSpeed

Betrieb: GmbH
Plz/Ort: H- Ungarn
Betriebsfläche: 3.050 ha
Ansprechpartner: Herr
Spritzenfahrer: Ja / (Nein)
Tel. Nr.: 0036- 209 437947
Spritzentyp: INUMA Gestängebreite: 36 m
Vorherige Düsentype: Lechler Menge 260 l/ha 14 Km/h

Düsengröße: TDDF HighSpeed 03

Anwendung in Kulturen:

Getreide: Herbizide/Fungizide /Ährenbehandlung
Aufwandmenge: l/ha 140 l/ha
Fahrgeschwindigkeit: km/h 16 km/h
Arbeitsdruck: bar 5 bar
Behandelte Fläche: ha 1.200 ha

Praktiker Meinung: große Flächenleistung durch geringe Aufwandmenge, gute Verteilung der Spritzbrühe

Zuckerrüben: Herbizide
Aufwandmenge: l/ha
Fahrgeschwindigkeit: km/h
Arbeitsdruck: bar
Behandelte Fläche: ha

Praktiker Meinung:

Ear treatment 1200 ha

HiSpeed 110-03

140 l/ha; 16 km/h; 5 bar

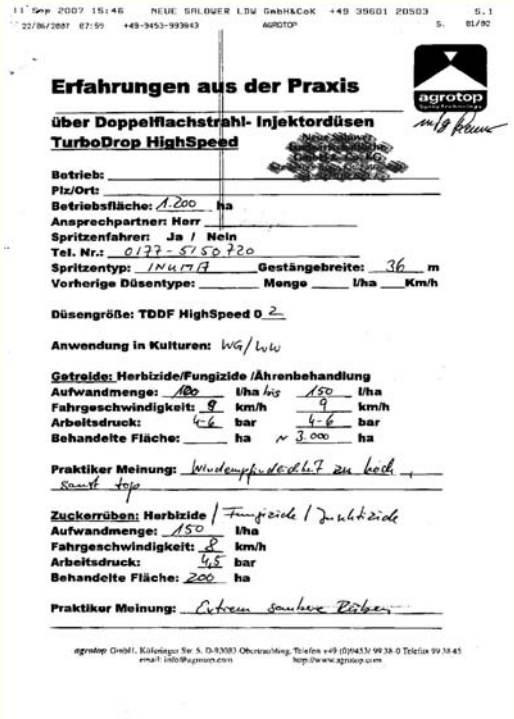
“High working rate due to lower application volume, good coverage.”

Cereals 3000 ha

HiSpeed 110-02

100-150 l/ha; 9 km/h; 4-6 bar

“Relatively fine spray (drift), perfect in all other respects.”



Erfahrungen aus der Praxis

über Doppelflachstrahl- Injektordüsen
TurboDrop HighSpeed

Betrieb:
Plz/Ort:
Betriebsfläche: 1.200 ha
Ansprechpartner: Herr
Spritzenfahrer: Ja / Nein
Tel. Nr.: 0177 - 5150720
Spritzentyp: INUMA Gestängebreite: 36 m
Vorherige Düsentype: Menge l/ha Km/h

Düsengröße: TDDF HighSpeed 02

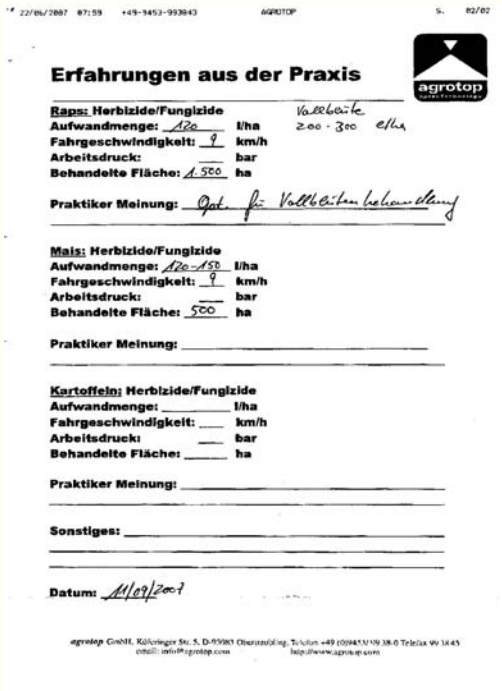
Anwendung in Kulturen: WG/WW

Getreide: Herbizide/Fungizide /Ährenbehandlung
Aufwandmenge: 100 l/ha bis 150 l/ha
Fahrgeschwindigkeit: 9 km/h 9 km/h
Arbeitsdruck: 4-6 bar 4-6 bar
Behandelte Fläche: ha ~ 3.000 ha

Praktiker Meinung: Windempfindlichkeit zu hoch, sonst top

Zuckerrüben: Herbizide / Fungizide / Insektizide
Aufwandmenge: 150 l/ha
Fahrgeschwindigkeit: 8 km/h
Arbeitsdruck: 4,5 bar
Behandelte Fläche: 200 ha

Praktiker Meinung: Extrem sauberes Bild



Erfahrungen aus der Praxis

Raps: Herbizide/Fungizide
Aufwandmenge: 120 l/ha Vollbeize 200 - 300 e/ha
Fahrgeschwindigkeit: 9 km/h
Arbeitsdruck: bar
Behandelte Fläche: 1.500 ha

Praktiker Meinung: Opt. für Vollbeizen bei wenig Verunkrautung

Mais: Herbizide/Fungizide
Aufwandmenge: 120-150 l/ha
Fahrgeschwindigkeit: 9 km/h
Arbeitsdruck: bar
Behandelte Fläche: 500 ha

Praktiker Meinung:

Kartoffeln: Herbizide/Fungizide
Aufwandmenge: l/ha
Fahrgeschwindigkeit: km/h
Arbeitsdruck: bar
Behandelte Fläche: ha

Praktiker Meinung:

Sonstiges:

Datum: 11/09/2007

Sugar bete 200 ha

HiSpeed 110-02

150 l/ha; 8 km/h; 4,5 bar

“Extremely clean field.”

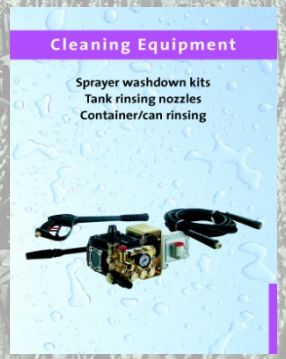
TurboDrop® HiSpeed

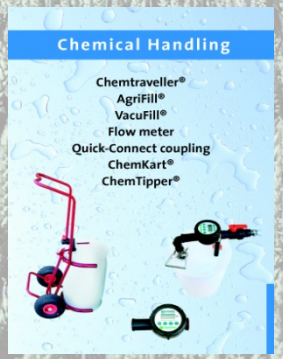
Conclusion:
Good coverage and efficacy of an application can be achieved, even at higher application speeds, using the appropriate nozzle technology.

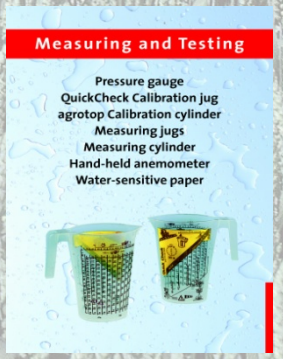
Thank you for your attention !

Your agrotop Team

Wherever you need us







http:// www.agrotop.com

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