

Where does your spray go?

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Key messages

The choice of nozzle affected where spray was deposited within the canola canopy.

Conventional flat fan 11002 nozzles provided better coverage at the top of the canopy and 11003 nozzles provided more even coverage throughout the canopy. Air induced nozzles had the poorest coverage but the highest average droplet size which would reduce drift.

In summary use 11002 to distribute spray preferentially at the top of the canopy, use 11003 for more even distribution through the canopy and use air induced nozzles for larger droplets and reduced drift.

The addition of a spray oil increased droplet size and potentially reduced drift for 11003 nozzles but had little effect when 11002 or air induced nozzles were used

Aims

To determine distribution of spray within a canola canopy using 3 different nozzle and 2 adjuvants.

Method

Canola at the early flowering stage and infested with Diamondback moth larvae was sprayed with 3 different Spraying Systems TeeJet® XR nozzles (flat fan 11002, flat fan 11003, and air induced flat fan 11002) and 2 adjuvants (Agral® wetting agent and Canopy® spray oil) at Freeling on October 1. All treatments were applied at 3kPa and the carrier volume achieved by adjusting speed.

The spray distribution was measured by placing water sensitive cards horizontally at 10, 30 and 50 cm above ground level within the canopy and at the top of the canopy at 100 cm above ground level. Two sets of cards were used in each plot and there were four replicates of each treatment.

Results

Figure 1 shows the air induced nozzles had a lower droplet density at every height within the canopy compared to the conventional flat fan nozzles. There was little difference between the 11002 and 11003 nozzles.

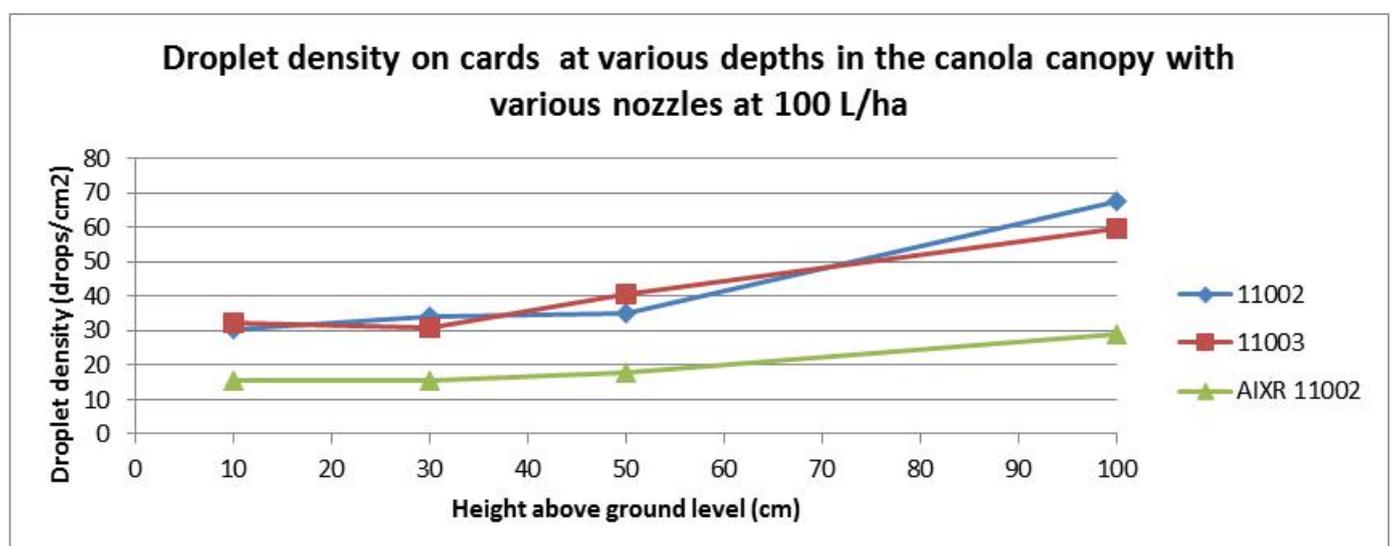


Figure 1: Spray droplet distribution in a canola canopy sprayed at early flowering.

Figure 2 shows that at the top of the canopy 11002 nozzles provide greater coverage than 11003 which provided greater coverage than the air induced nozzles. The 11003 nozzles provided the most even distribution throughout the canopy.

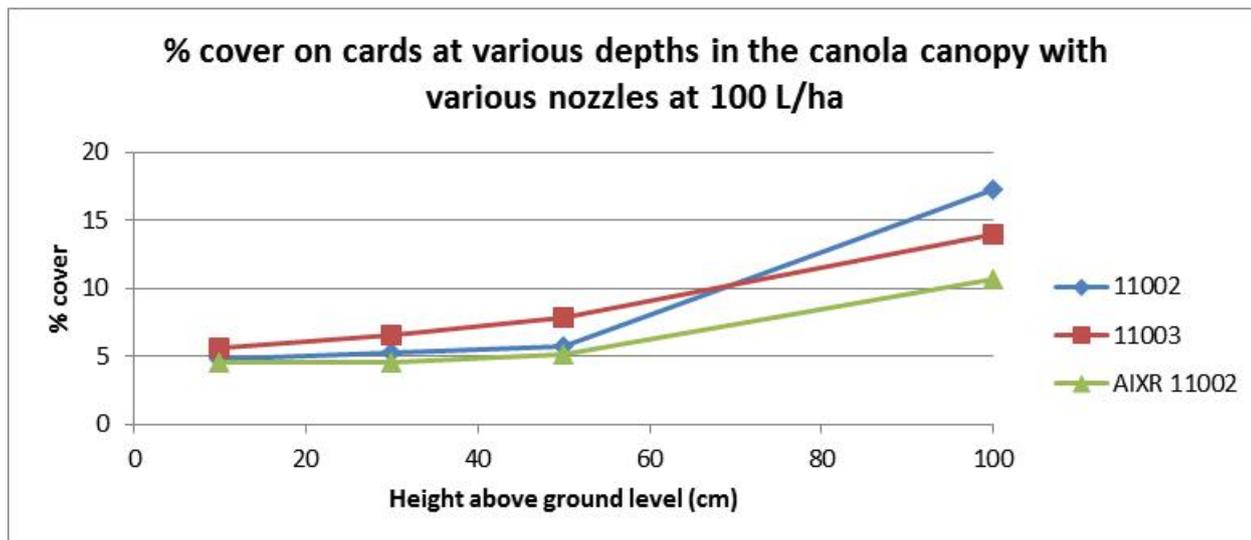


Figure 2: Spray cover in a canola canopy sprayed at early flowering.

DN50 (at 100 L/ha carrier)

The DN50 is the droplet size where 50% of droplets are smaller than that size and is a measure of spray droplet size.

Changing the adjuvant from wetting agent to spray oil increased the DN50 for 11003 nozzles but had no significant effect for other nozzle types.

11003 and 11002 nozzles had similar sized droplets for sprays with wetting agent. Using spray oil increased the average droplet size for 11003 nozzles but had little effect for 11002 nozzles. Air induced AIXR11002 nozzles had larger droplets and was the same for both adjuvants (see Table 1).

Table 1: The effect of nozzle type and adjuvant on the average droplet size.

Nozzle and adjuvant	Mean DN50 (microns)	
11002 Wetting agent	185.9	a
11002 Spray oil	189.5	a
11003 Wetting agent	184.5	a
11003 Spray oil	216.0	b
AIXR 11002 Wetting agent	234.1	c
AIXR 11002 Spray oil	234.6	c

Conclusion

For non-systemic products conventional nozzles could be a better choice because they provide better coverage at all levels in the canopy. The finer 11002 nozzles provided greater coverage at the top of the canopy and the 11003 provided better coverage throughout the canopy. The air induced nozzles had larger droplets which would reduce drift and could be appropriate where systemic, highly translocated products are being used.

There was an interaction between adjuvant and nozzle type on droplet size. Compared to wetting agent, spray oil increased the average droplet size for the 11003 nozzles but had no significant effect for the other 2 nozzle types.

Key words

Air induced nozzles, DN50, canola, canopy penetration, drift, droplet size, nozzles, spray oil, wetting agent.

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