

# Fungicide Application Technology

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# Objective:

- Determine the effect of application parameters on the fate of spray in narrow-row (7.5 inch drilled) soybean canopies



# Measures of sprayer performance

- Spray coverage
- Spray deposit
  - Lower canopy: 12 inches above ground
  - Middle canopy: 24 inches above ground
- Fungicide (Headline) spray residue on plant tissue
  - Sampled several plants from each spray plot
  - Separated leaves from stems
  - Separated middle and bottom sections



# 2005 Asian Soybean Rust Field Trials: Treatments

Treatment		Pressure (psi)	Speed (mph)	Nozzle Flow (gpm)	Spray Quality
Sprayer	Nozzle				
Jacto air-assist sprayer	Jacto JA3 (cone)	154	7	0.35	fine
Boom sprayer	XR8004	31	7	0.35	medium
Boom sprayer	XR8002	42	4	0.20	fine
Boom sprayer	XR8005	20	7	0.35	coarse
Boom sprayer	Turbo Dual QJ90- TT11002 (twin-fan)	31	7	0.35	medium
Boom sprayer	TJ60-8004 (twin-fan)	31	7	0.35	medium
Boom sprayer	TX-18 (hollow cone)	54	7	0.35	medium
Boom sprayer with canopy opener	XR8004	31	7	0.35	medium

Application rate for all treatments: 15 gpa



# Sprayer Treatments

TX-18 hollow cone

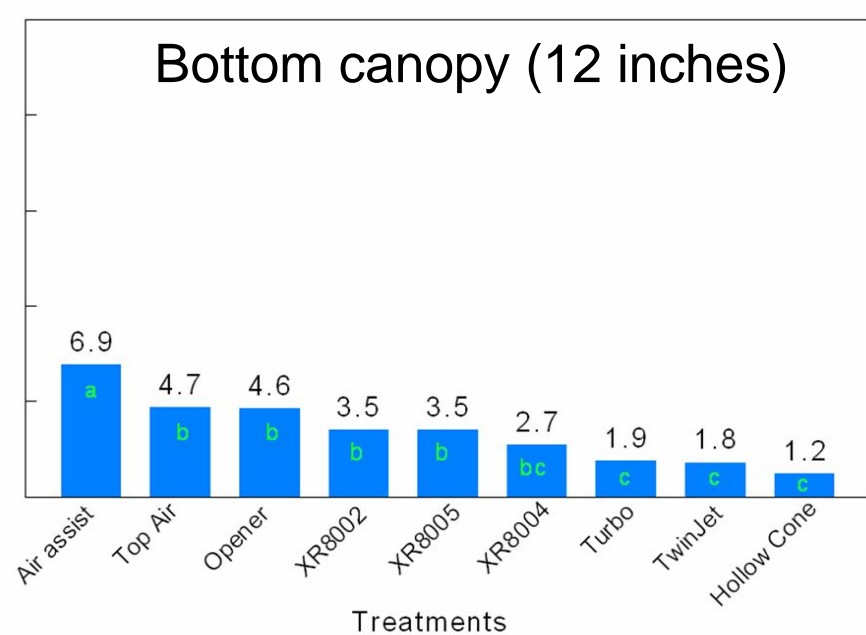
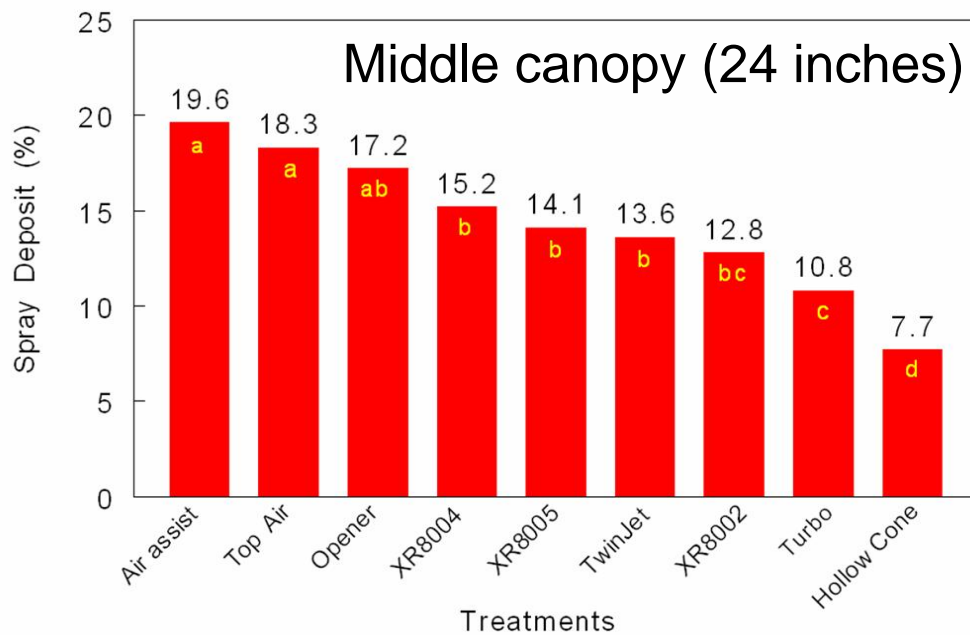


Canopy opener, XR8004  
flat fan

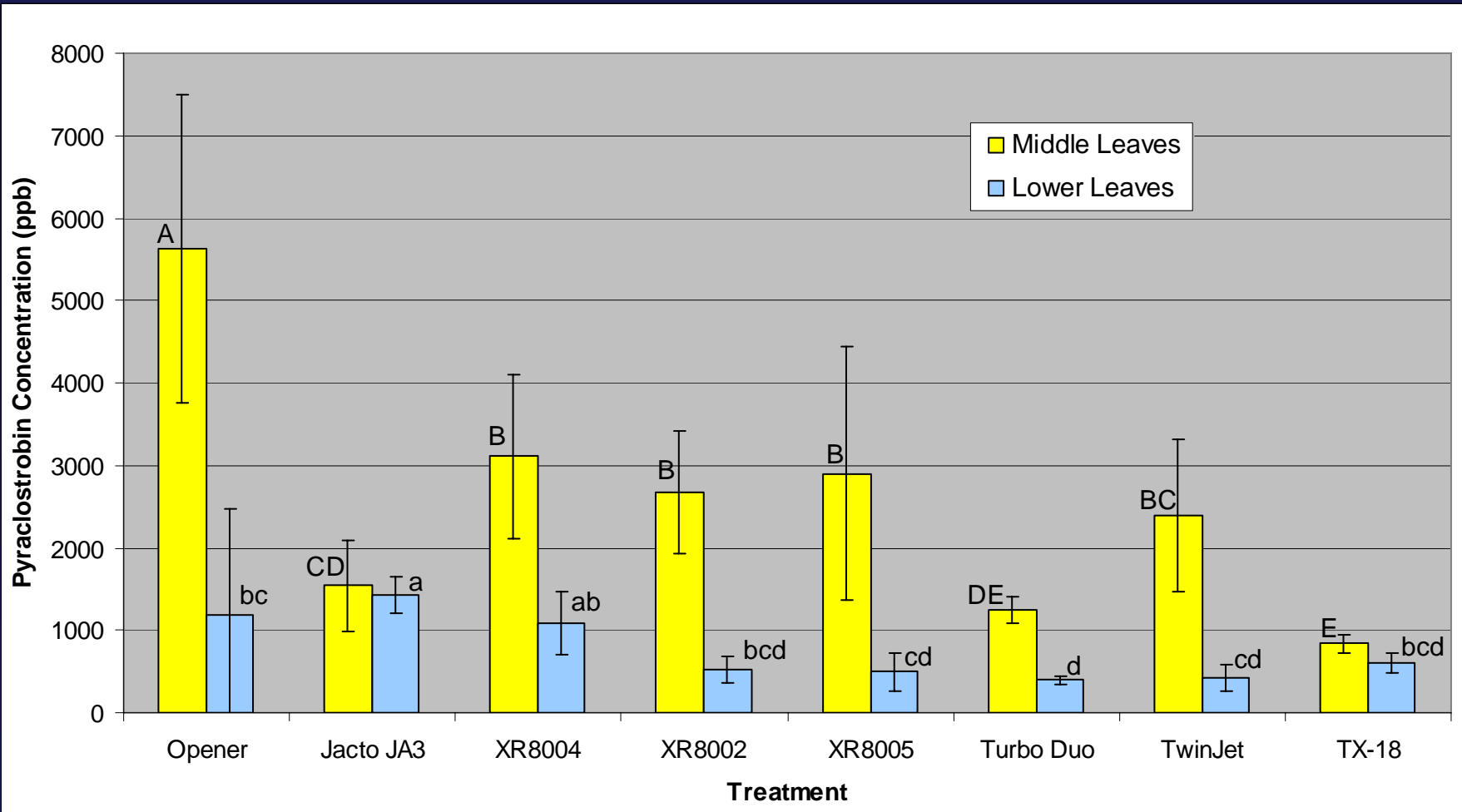


XR8004 Flat fan

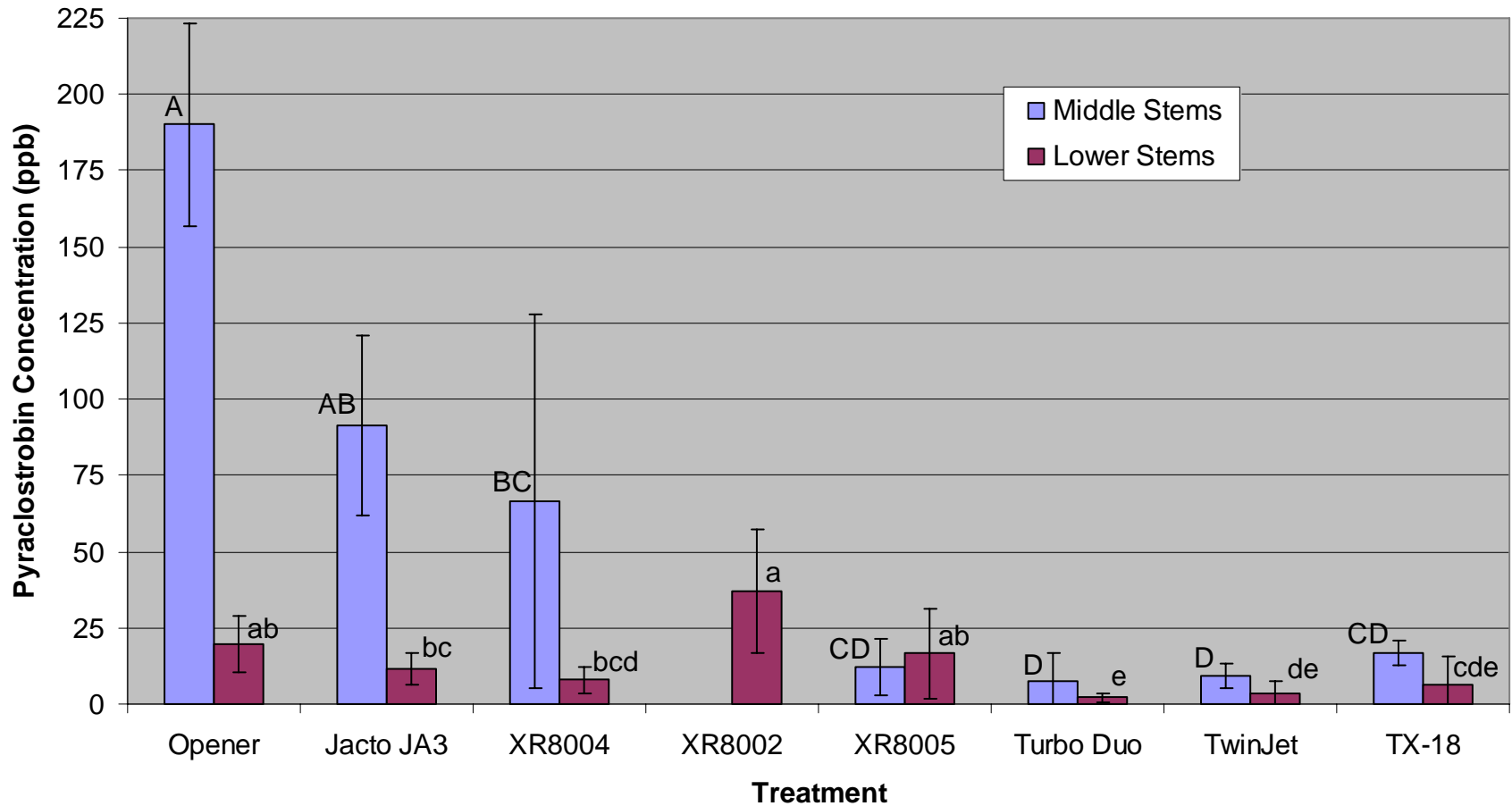
# Results: 2005 Percent Spray Volume deposited on artificial targets



# Results: 2005 Fungicide Deposits (Leaves)



# Results: 2005 Fungicide Deposits (Stems)



# 2006 Asian Soybean Rust Field Trials: Treatments

Treatment		Pressure (psi)	Nozzle Flow (gpm)	Application Rate (gpa)
Sprayer	Nozzle			
Boom sprayer	XR8004	34	0.35	15
Boom sprayer	XR8004	59	0.47	20
Boom sprayer	TTJ60-11003	57	0.35	15
Jacto air-assist sprayer	11002AXI (fan)	48	0.24	10
Jacto air-assist sprayer	11002AXI (fan)	118	0.35	15
Jacto air-assist sprayer	Jacto JA3 (cone)	151	0.35	15

Travel speed for all treatments: 7 mph



# Sprayer Treatments

Jacto air-assist, flat fan 11002AXI (fan)



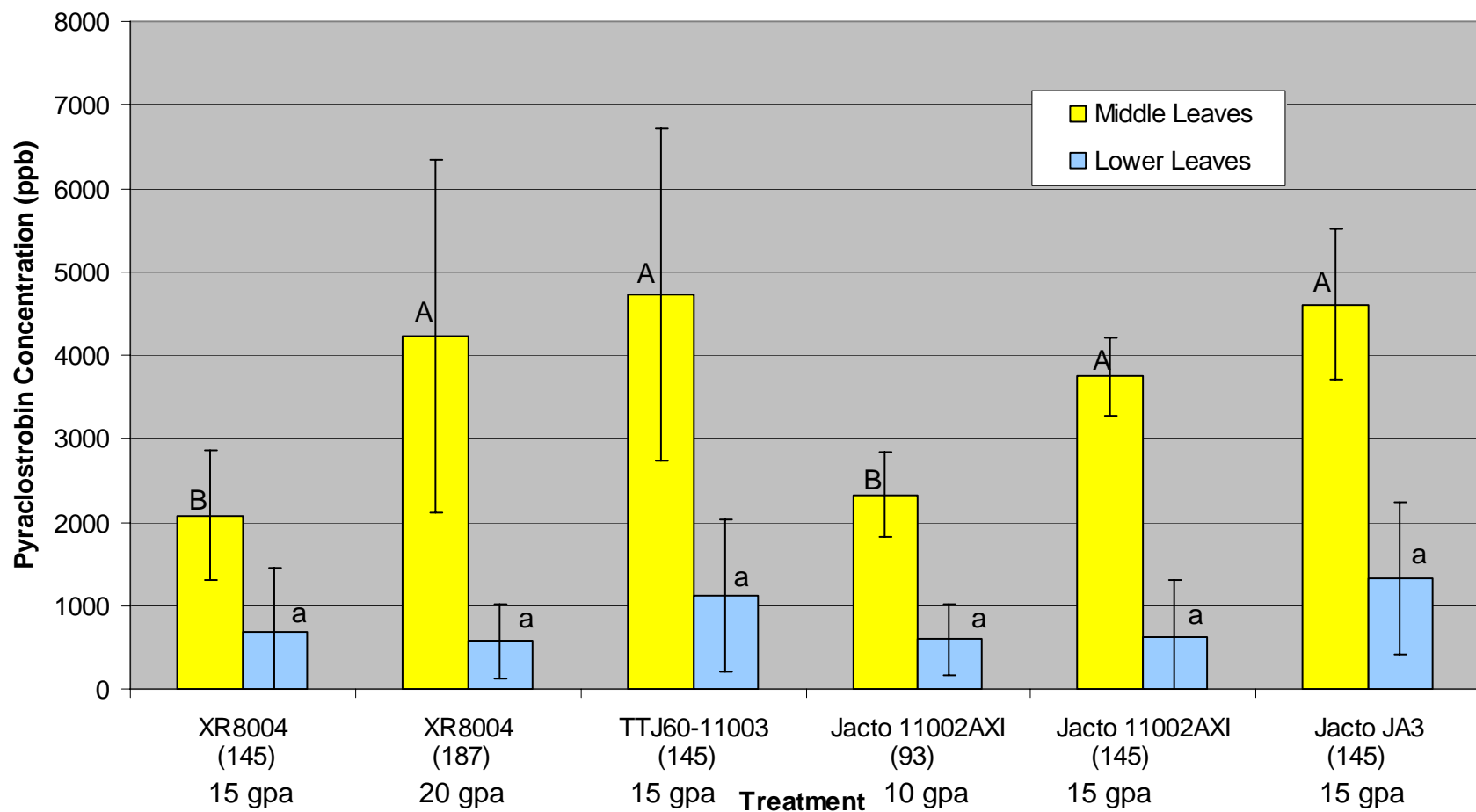
Conventional broadcast, TTJ60-11003



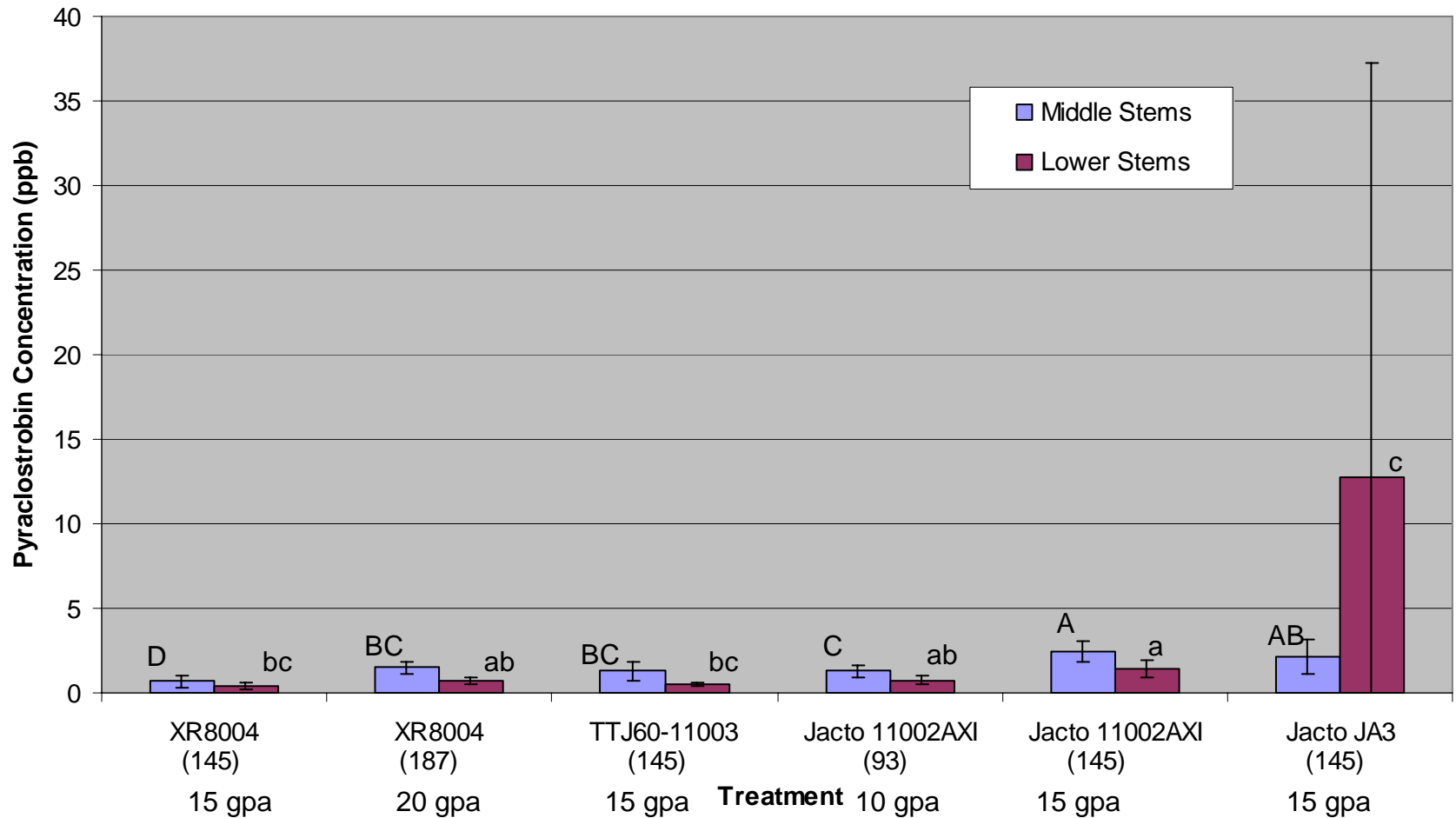
Jacto air-assist, JA3 (cone)



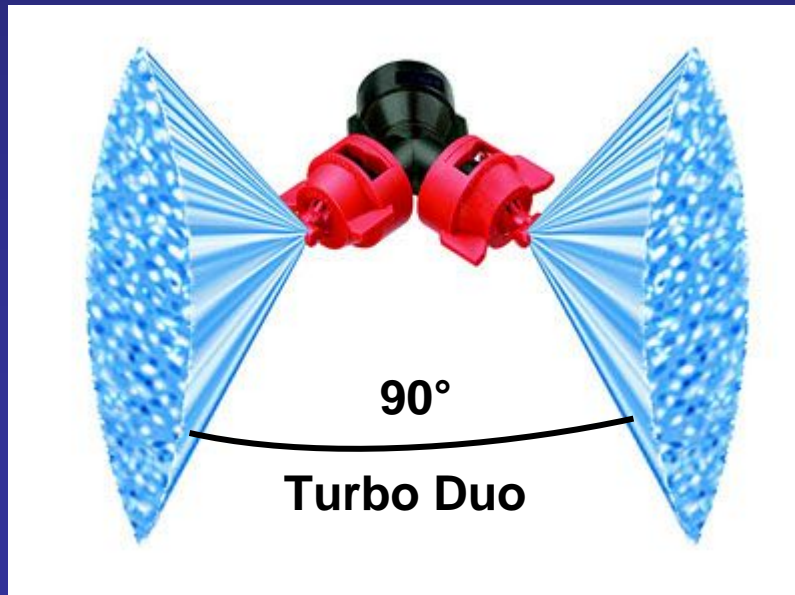
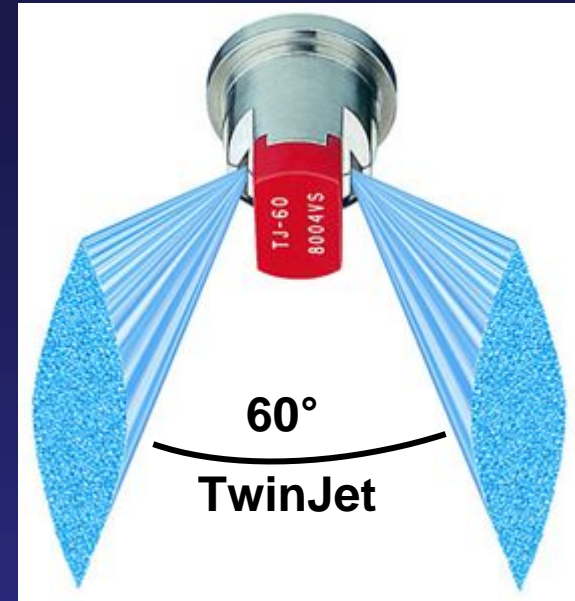
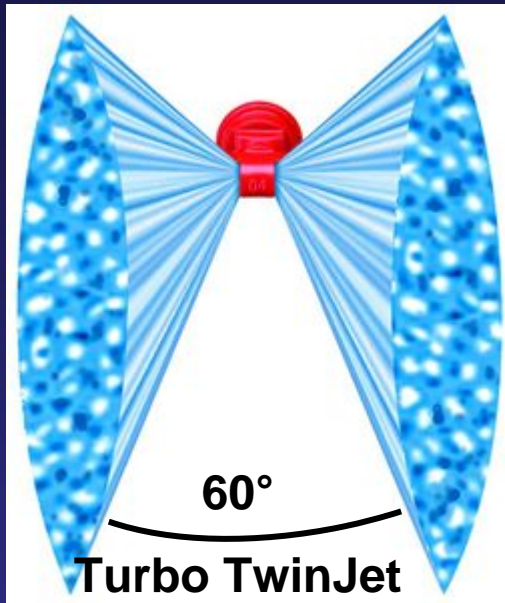
# Results: 2006 Fungicide Deposits (Leaves)



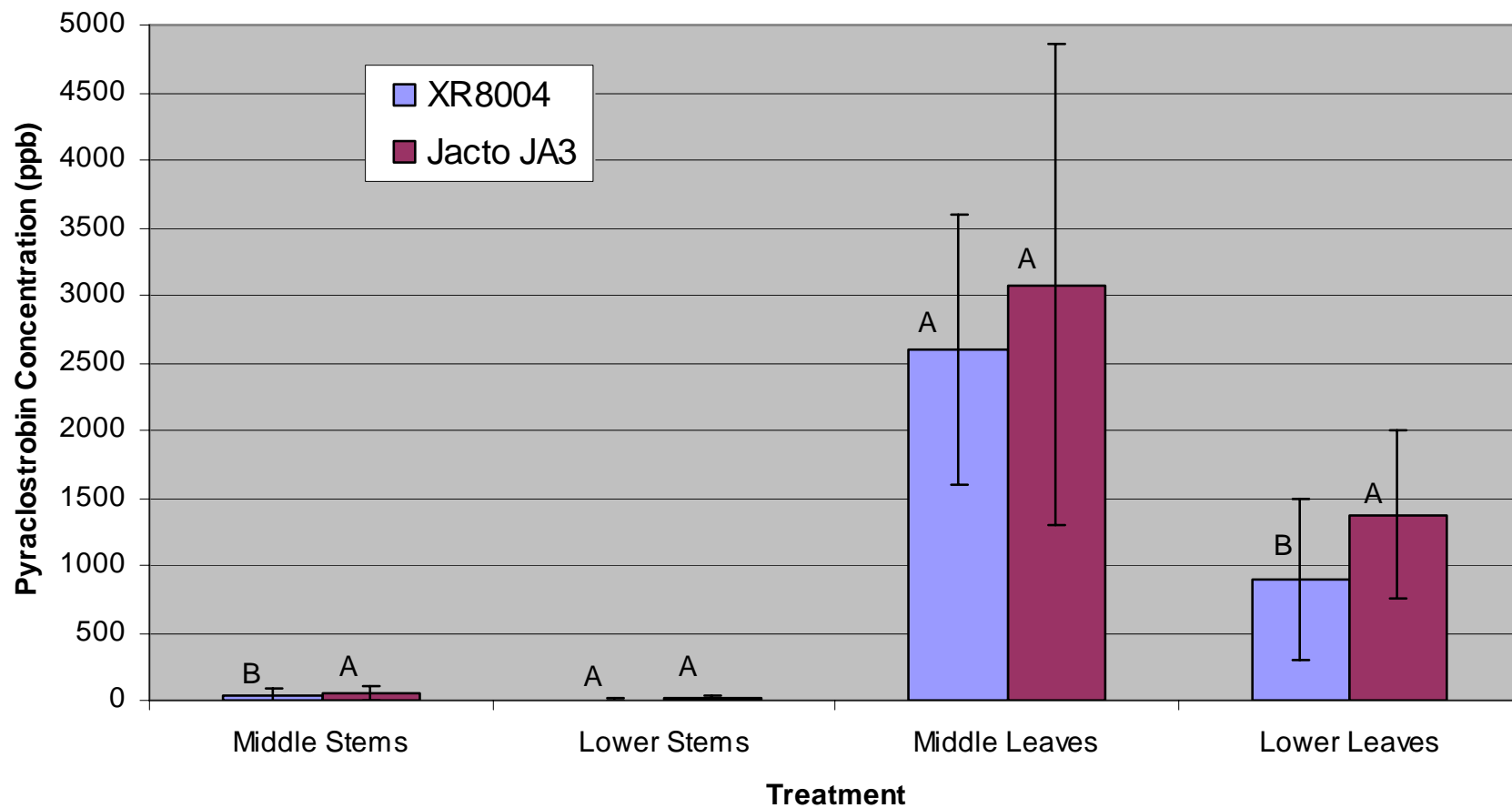
# Results: 2006 Fungicide Deposits (Stems)



# Rust Trial Nozzles



# Across 2005 & 2006: Fungicide deposits



# Summary & Conclusions:

- Much less pesticide residue found on stem tissue than leaf tissue
- Significant differences in residue between middle and lower canopy area
- Canopy differences affect deposition
  - Higher deposits and coverage found in shorter/less dense canopy
- ‘Medium’ quality sprays performed well for conventional, broadcast applications

# Summary & Conclusions:

- Application rate not a good predictor of pesticide residue levels (\*for range tested)
- Air-assisted sprays aid deposition lower in the canopy (and lower application rate)
- Spray pattern alone not a good predictor of pesticide deposits
- Amount of pesticide residue not a perfect predictor of efficacy

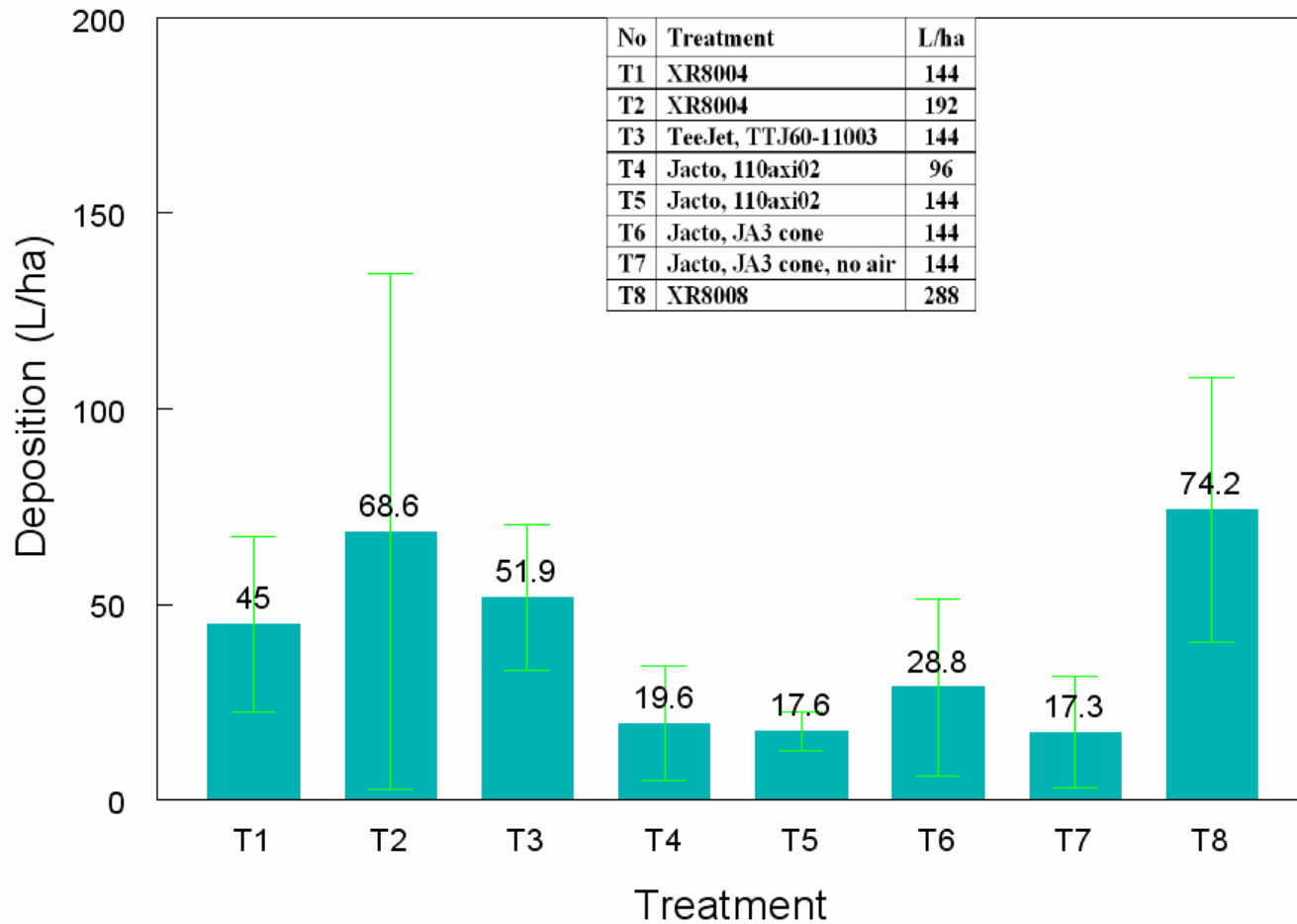
# 2007 Asian Soybean Rust Field Trials: Treatments

Treatment		Pressure (psi)	Nozzle Flow (gpm)	Application Rate (gpa)
Sprayer	Nozzle			
Boom sprayer	XR8004	21	0.35	15
Boom sprayer	XR8004	45	0.47	20
Boom sprayer	TTJ60-11003	45	0.35	15
Jacto air-assist	11002AXI (flat fan)	58	0.24	10
Jacto air-assist	11002AXI (flat fan)	130	0.35	15
Jacto air-assist	JA3 (hollow cone)	155	0.35	15
Jacto (No air)	JA3 (hollow cone)	155	0.35	15
Boom sprayer	XR8008	29	0.70	30

Travel speed for all treatments: 7 mph

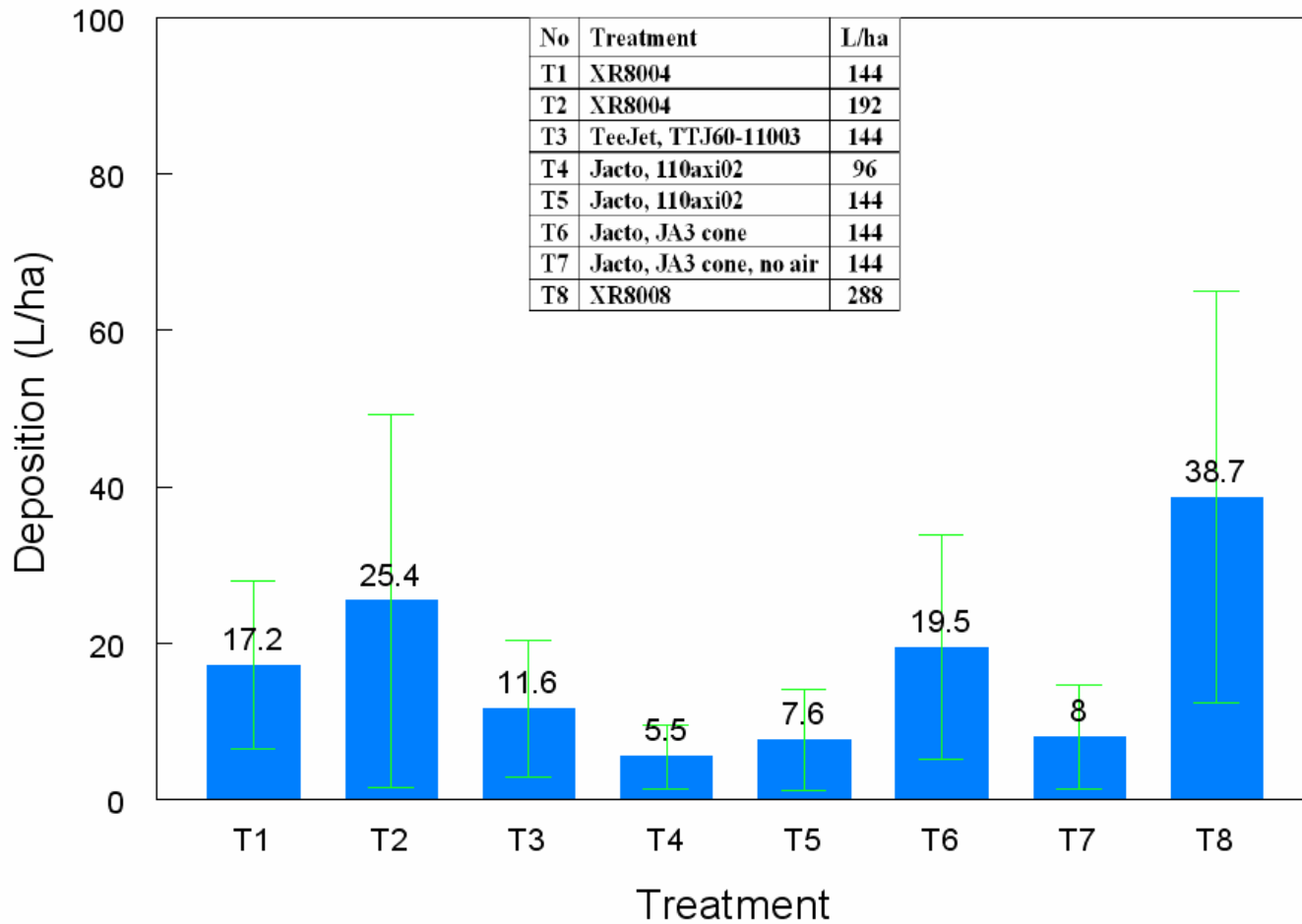
# 2007 Preliminary Results: Dye target deposits

Spray deposition at the middle part inside soybean canopies (2007 test)



# 2007 Preliminary Results: Dye target deposits

Spray deposition at the bottom part inside soybean canopies (2007 test)



# 2007 Preliminary Summary & Conclusions:

- Spray volume not necessarily a significant parameter for range of volumes tested (10-30 gpa)
- Similar amounts of dye found on lower canopy artificial targets for air-assist and non-air treatments
- Smaller droplet, hollow cone nozzle with air produced higher deposits than flat fan nozzle with air
- Continuing analysis of tracer and pesticide residue

# Questions?

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