On-Farm Evaluations of Auxin Nozzles For Peanut Pest Management (Year 2)

E.P. Prostko[1], M.R. Abney, R.C. Kemerait, G.C. Rains, D. S. Carlson, J.L. Jacobs, D.B. Sutherland, W.G. Tyson

[1]*Department of Crop & Soil Sciences*

UNIVERSITY OF GEORGIA
College of Agricultural & Environmental Sciences

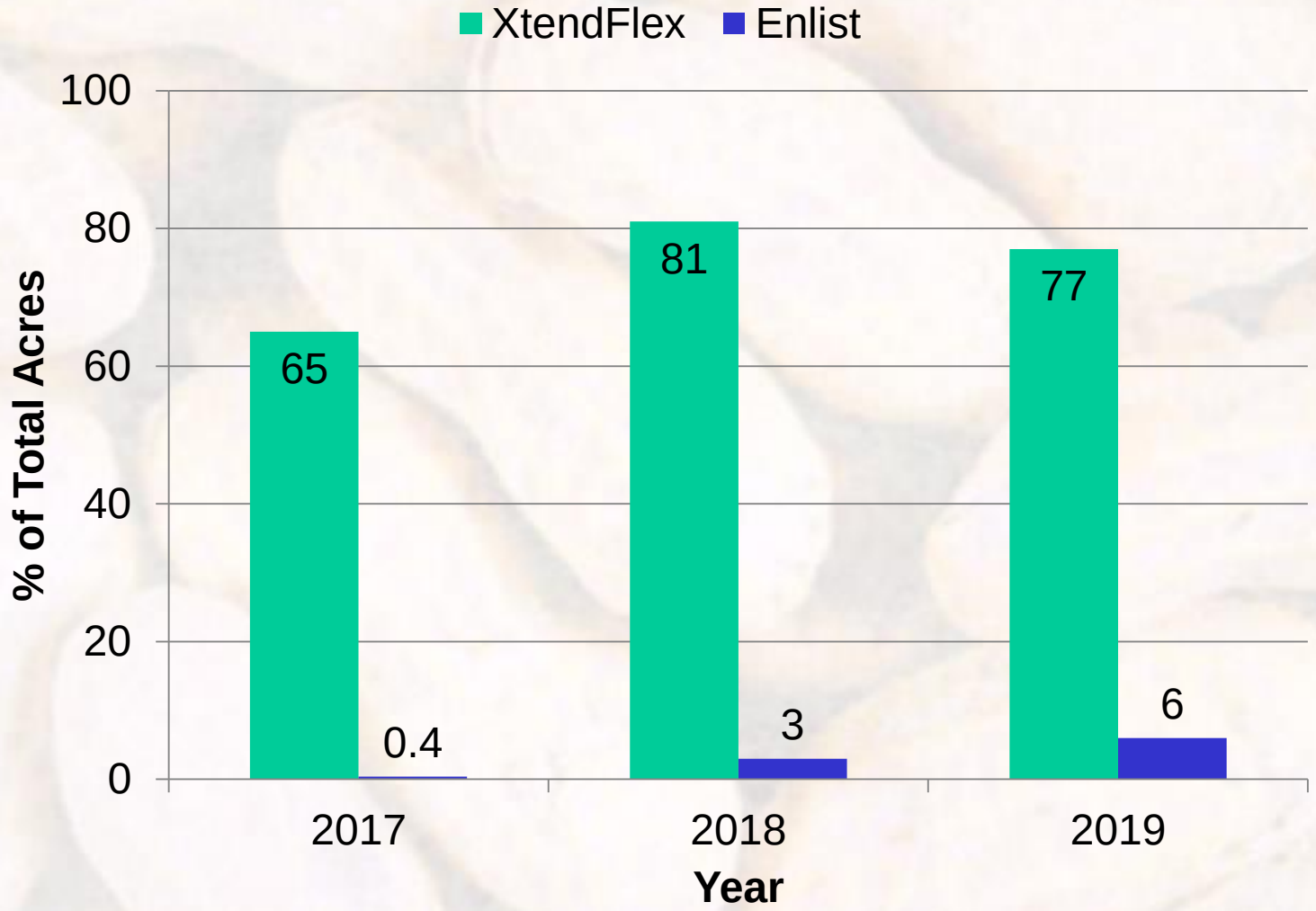
Peanut and Cotton In Georgia - 2019

660,000 acres harvested
47.4% of US Total (#1)

1,390,000 acres harvested
11.8% of US Total (#2)

Source: USDA/NASS, *Crop Production – 2019 Summary (01*/10/2020)

XtendFlex® and Enlist™ Cotton Varieties in Georgia



Source: USDA/AMS Annual Cotton Variety Reports (mp_cn833)

Nozzle Requirements for Auxins

Manufacturer	Nozzle Type	Part Number	Operating Pressure (psi)							
			20	30	40	50	60	70	80	90
Greenleaf Technologies	TADF03-D	TADF03-D	Min 20		Max 40					
	TADF06-D	TADF06-D	Min 20			Max 50				
	TDXL 11003-D	TDXL 11003-D	Min 20		Max 40					
	TDXL 11004-D	TDXL 11004-D	Min 20			Max 50				
	TDXL 11005-D	TDXL 11005-D	Min 20				Max 60			
	TDXL 11006-D	TDXL 11006-D	Min 20				Max 60			
Pentair Hypro	ULD120-04	ULD120-04 / FC-ULD120-04	Min 20		Max 40					
	ULD120-05	ULD120-05 / FC-ULD120-05	Min 20		Max 40					
John Deere	ULD120-04	PSULD2004 / PSULDQ2004	Min 20		Max 40					
	ULD120-05	PSULD2005 / PSULDQ2005	Min 20		Max 40					
Lechler	ID 110-03	ID 110-03 / ID 110-03C		Min 30	Max 40					
	ID 110-04	ID 110-04 / ID 110-04C		Min 30	Max 40					
	ID 110-05	ID 110-05 / ID 110-05C		Min 30	Max 40					
	ID 80-04	ID 80-04 / ID 80-04C		Min 30	Max 40					
TeeJet® Technologies	AI11003	AI11003-VS / AIC1103-VS		Min 30	Max 40					
	AI8003	AI8003-VS / AIC8003-VS		Min 30	Max 40					
	AI8005	AI8005-VS / AIC8005-VS		Min 30	Max 40					
	TTI11003	TTI11003-VP	Min 20				Max 60			
	TTI11004	TTI11004-VP	Min 20				Max 63			
	TTI11005	TTI11005-VP	Min 20				Max 60			
	TTI11006	TTI11006-VP	Min 20			Max 50				
	TTI60-11003	TTI60-11003VP		Min 30		Max 50				
	TTI60-11004	TTI60-11004VP		Min 30			Max 60			
	TTI60-11005	TTI60-11005VP		Min 30			Max 60			
	TTI60-11006	TTI60-11006VP		Min 30			Max 60			
Wilger	DR110-10	40286-10		Min 30	Max 40					
	UR110-05	40292-05		Min 30		Max 50				
	UR110-06	40292-06		Min 30			Max 60			
	UR110-08	40292-08		Min 30				Max 70		
	UR110-10	40292-10		Min 30				Max 70		
Total Ag Industries	MUG110-02	M-1080		Min 30						Max 90
	MUG110-025	M-1081		Min 30						Max 90
	MUG110-03	M-1082		Min 30						Max 90
	MUG110-035	M-1083		Min 30						Max 90
	MUG110-04	M-1084		Min 30						Max 90
	MUG110-05	M-1085		Min 30					Max 80	

Xtendimax®

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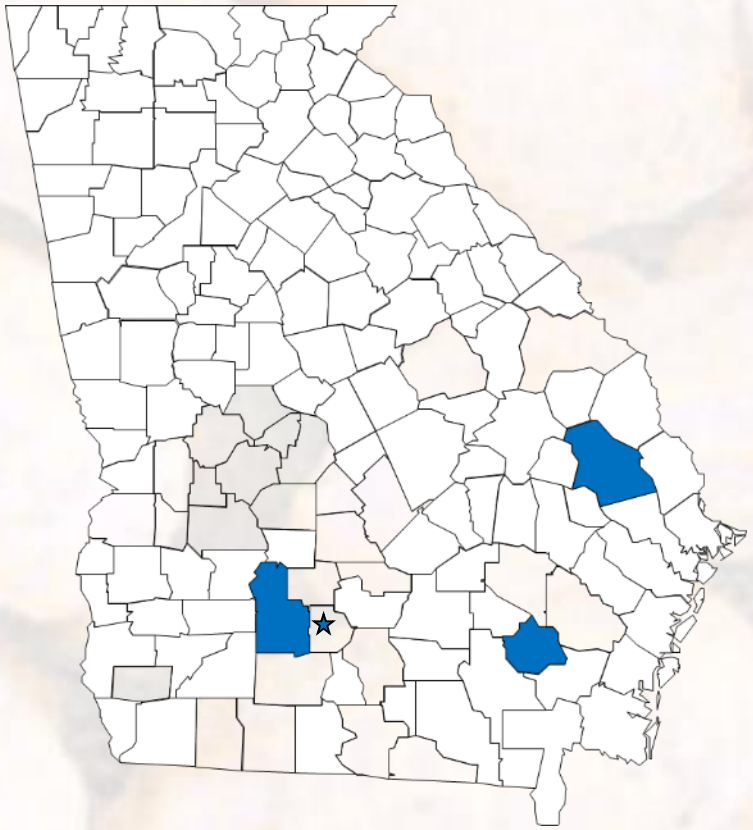
Small-Plot Research vs. Commercial Applications *(Are we missing something?)*

Objective:

- Compare the field performance of auxin nozzles (TTI, TDXL) to flat fan nozzles in commercial peanut fields (year 2).
- Spray card analysis
  - *droplet size and coverage*
  - *DropletScan or DepositScan*
- weeds, insects, disease, yield

2019 Nozzle Tests
Farmer Cooperators

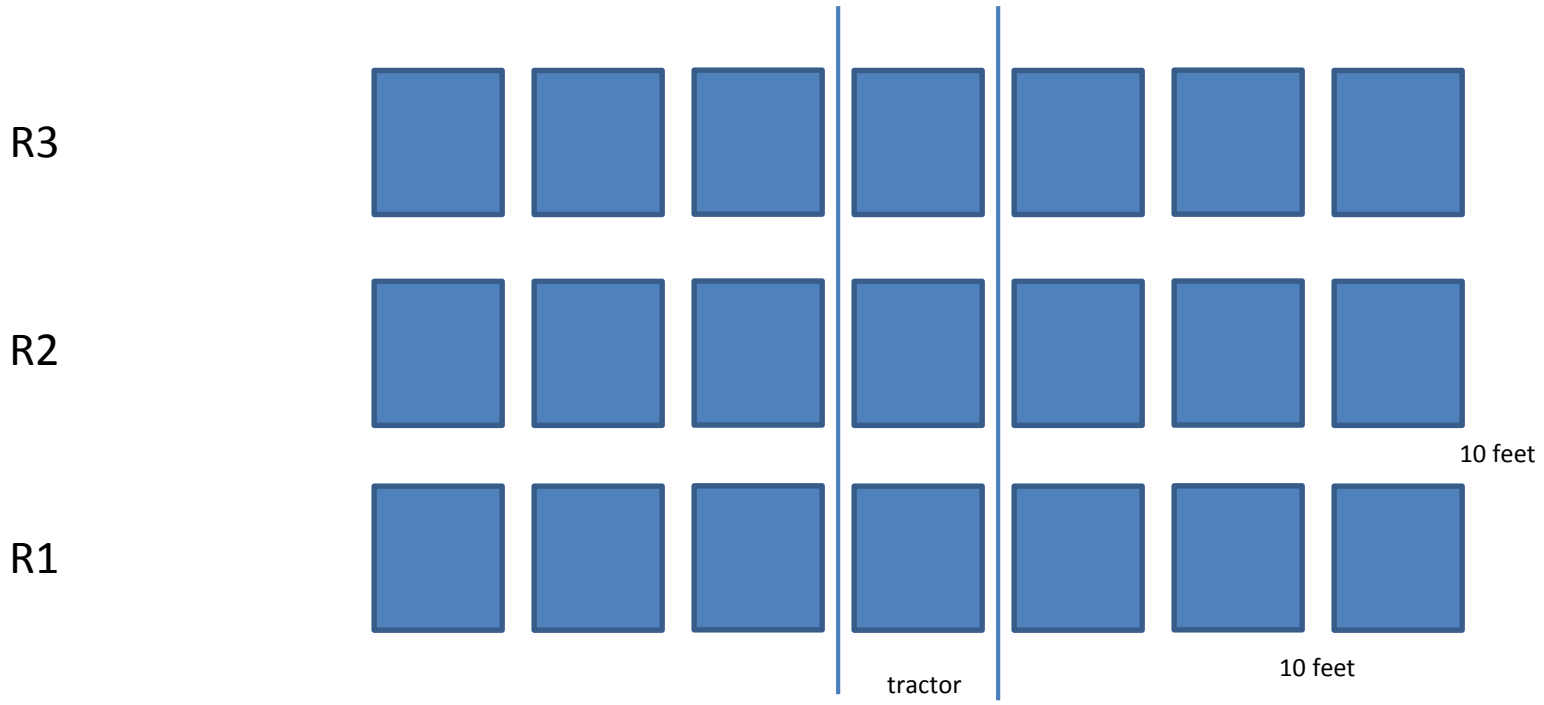
- Bulloch County
  - *Greg Sikes*
  - *JD4630, 90’ boom*
- Pierce County
  - *Jim Waters*
  - *JD4730, 100’ boom*
- Worth County
  - *Steve Patterson*
  - *JD4730, 90’ boom*



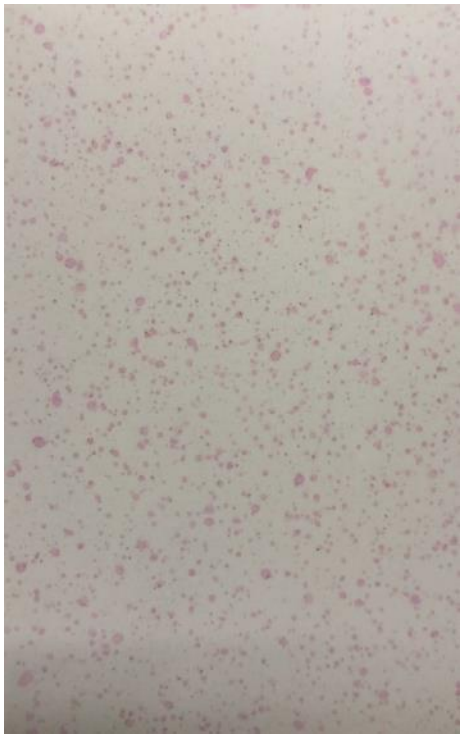
2019 Commercial Nozzle Tests

Spray Card Analysis

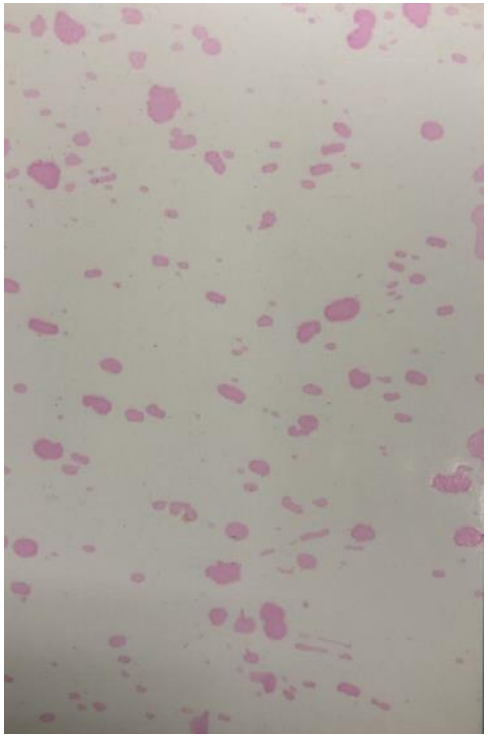
2019 Nozzle Tests
VMD_{50} and Coverage



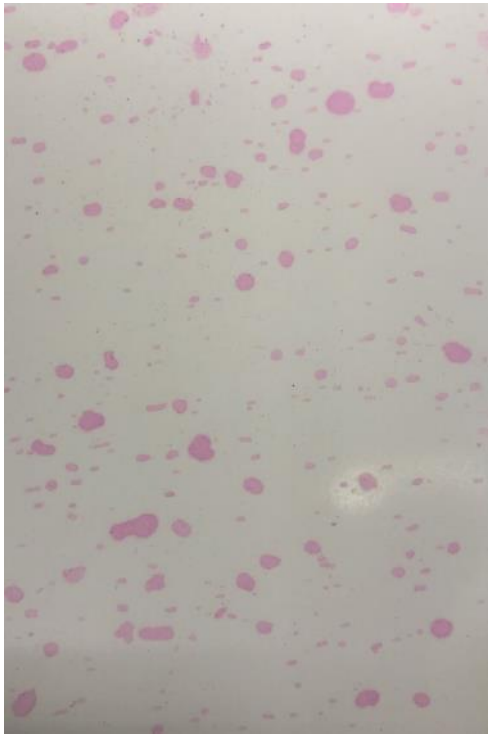
Bulloch County Nozzle Test
March 21, 2019 (Rep 2, card #4)



XRC-11004



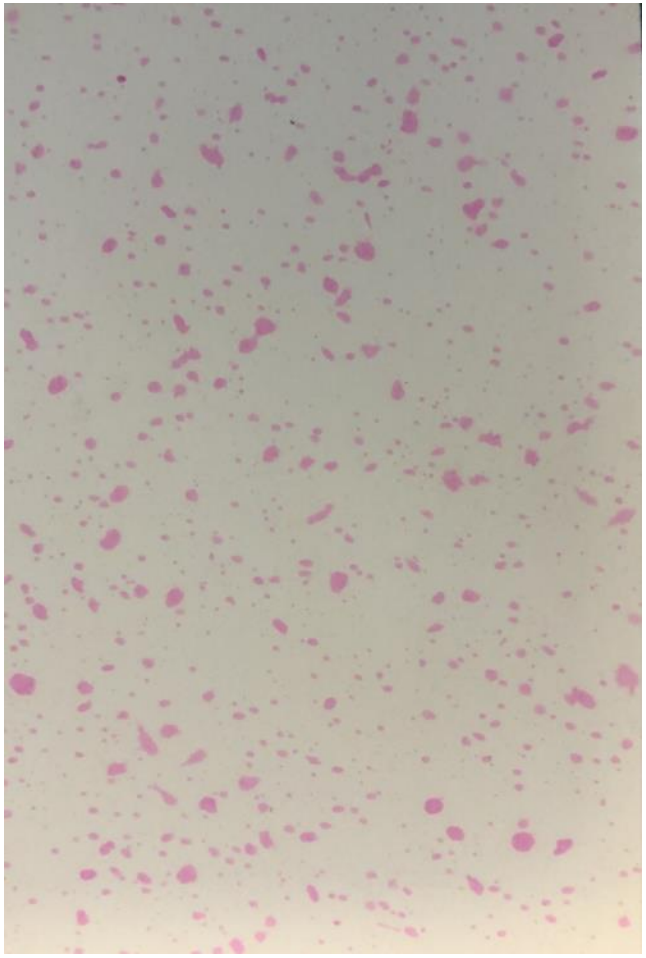
TTI-11004



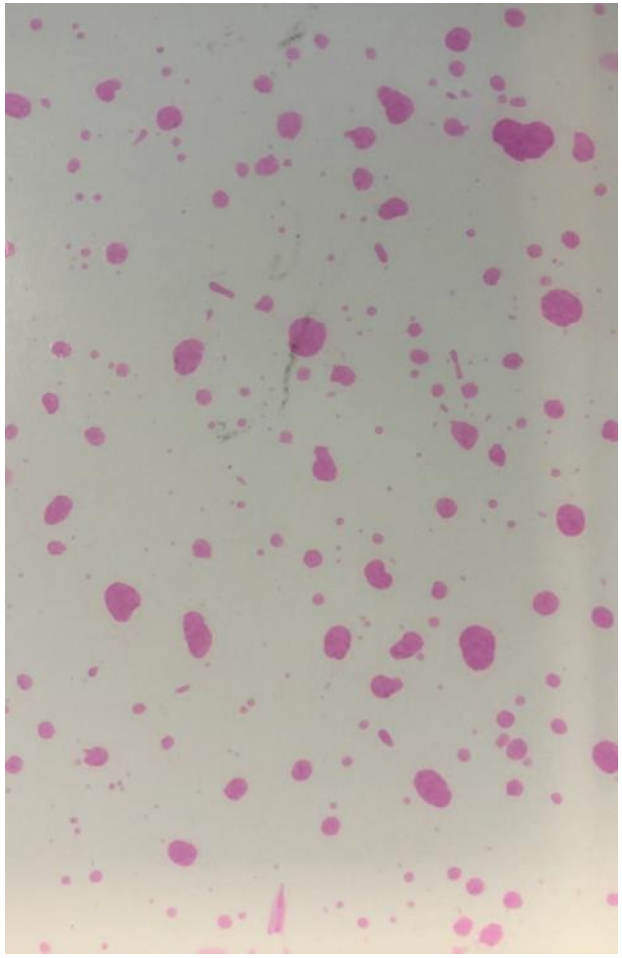
TDXL-11004D

JD 4630, 90’ boom, 15” spacing, 12 GPA, 12 MPH, 28 PSI, 36” boom height (avg.)

Pierce County Nozzle Test
March 26, 2019 (Rep 1, card #5)



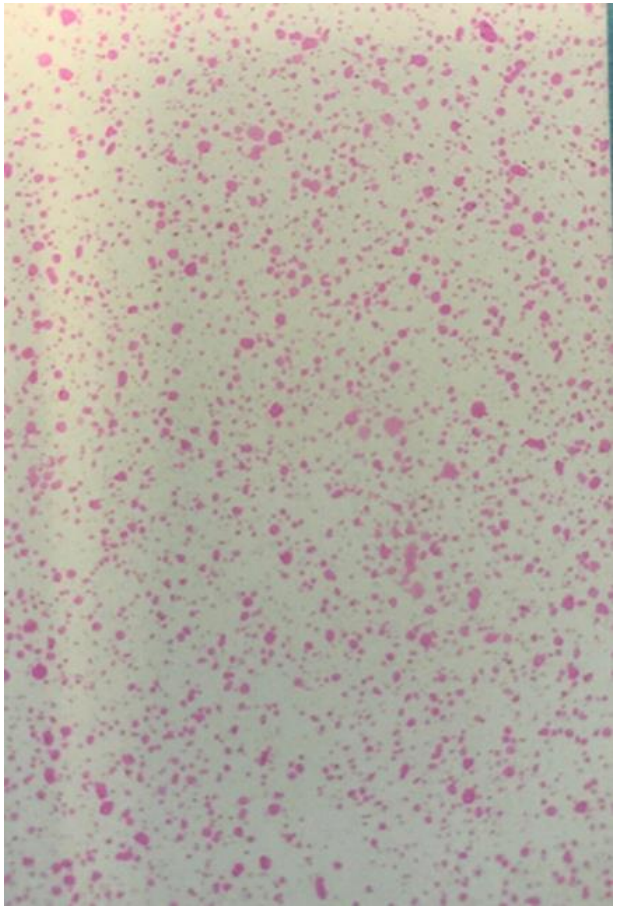
XR-11006



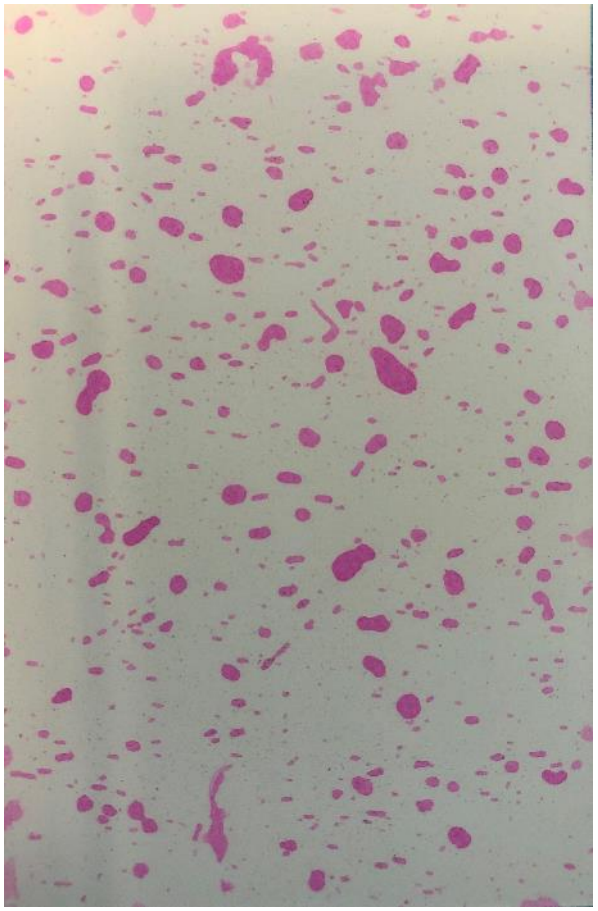
TTI-11006

JD 4730, 100’ boom, 15” spacing, 15 GPA, 11.6 MPH, 18-20 PSI, 36” boom height (avg.)

Worth County Nozzle Test
April 4, 2019 (Rep 2, card #2)



XRC-11006



TTI-11006

JD 4730, 90’ boom, 20” spacing, 20 GPA, 12.5 MPH, 42-57 PSI, 36” boom height

Droplet Size and Spray Coverage from 2019 Nozzle Tests with Commercial Sprayers[1]

	Bulloch[1,3]			Pierce[1,4]		Worth[2,5]	
	TTI-11004	XRC-11004	TDXL-11004	TTI-11006	XR-11006	TTI-11006	XRC-11006
VMD_{50} (microns)	456 a[6]	182 c	411 b	381 a	196 b	481 a	348 b
Coverage (%)	11.8 a	8.1 b	12.0 a	5.4 a	3.4 b	10.0 a	7.4 a

[1]According to DepositScan™
[2]According to DropletScan™
[3]JD4630, 90' boom, 15" nozzle spacing, 12.0 MPH, 12 GPA, 28 PSI, 36" boom height
[4]JD4730, 100' boom, 15" nozzle spacing, 11.6 MPH, 15 GPA, 18-20 PSI, 36" boom height
[5]JD4730, 90' boom, 20" nozzle spacing, 12.5 MPH, 20 GPA, 42-57 PSI, 36" boom height
[6]Means in the same row within same location with the same letter are not significantly different (LSD = 0.10). Means from 21 kromekote water sensitive cards.

2019 Commercial Nozzle Tests
Field Methodology

- 3 commercial peanut fields
- Plot size
  - *sprayer width (90'-100') X field length (437'-1993')*
- 4 replications
- 2 nozzle types
  - *3 in Bulloch*
- All agri-chemicals
- ANOVA
- Fisher's Protected LSD (P=0.10)

2019 Nozzle Tests
(Weeds, Insects, Disease, Yield)

2019 Peanut Nozzle Tests

County	Rotation	Variety	Irrigated (I) or Dryland (D)	Tillage	Row Pattern	Planting Date	Digging Date	Harvest Date
Bulloch	cotton cotton **peanut**	GA-06G	D	ST	Single	May 17	Oct. 3	Oct. 8
Pierce	cotton cotton **peanut**	GA-06G	D	CT	Single	May 18	Oct.1	Oct. 5
Worth	peanut cotton **peanut**	GA-06G	I	CT	Twin	May 9	Sept. 21	Sept. 24

2019 Nozzle Tests

Pesticides/Fertilizers Applied

County	Total Applications (#)	Herbicides	Fungicides	Insecticides	Other
Bulloch	6	Valor Strongarm Cadre Dual Magnum 2,4-DB	Approach Prima Equus Elatus Convoy Tebusol	Dimilin	Boron PegPower
Pierce	6	Valor Dual Magnum Cadre 2,4-DB	Bravo Priaxor Provost Silver Tebuconazole	Dimilin	Boron
Worth	6	Gramoxone Dual Magnum Warrant Basagran Cadre	Headline Topsin Tebuconazole Convoy Chlorothalinol	Orthene Dimilin	Boron Manganese Ascend

Late-Season Insect, Weed, and Disease Ratings from 2019 Nozzle Tests with Commercial Sprayers**

	Bulloch[1]			Pierce[2]		Worth[3]	
	TTI-11004	XRC-11004	TDXL-11004	TTI-11006	XR-11006	TTI-11006	XRC-11006
Total # of insects (#/15 swp)	8.0	10.0	9.8	7.8	7.8	22.8	20.0
Total # of weeds (#/m^2)	0	0	0	1.4	0.2	0	0
Leaf Spot (1-10)	1.0	1.0	1.0	1.0	1.0	1.2	1.1
White Mold (%)	7.3	8.9	7.1	4.1	5.3	8.7	6.9

[1]JD4630, 90' boom, 15" nozzle spacing, 12.0 MPH, 12 GPA, 28 PSI, 36" boom height
[2]JD4730, 100' boom, 15" nozzle spacing, 11.6 MPH, 15 GPA, 18-20 PSI, 36" boom height
[3]JD4730, 90' boom, 20" nozzle spacing, 12.5 MPH, 20 GPA, 42-57 PSI, 36" boom height
No significant differences were observed between nozzle type at any location (P>0.10).

2019 Nozzle Test
XRC-11004-VP

Bulloch Co.
9/9/19
115 DAP

2019 Nozzle Test
TTI-11004-VP

Bulloch Co.
9/9/19
115 DAP

2019 Nozzle Test
TDXL-11004-D

Bulloch Co.
9/9/19
115 DAP

Yield Data

18’ or 36’ width by field length (0.18-1.07A)

Bulloch Co.
10/08/19

Peanut Yield As Influenced By Nozzle Type from 2019 Nozzle Tests with Commercial Sprayers

	Bulloch[1]			Pierce[2]		Worth[3]	
	TTI-11004	XRC-11004	TDXL-11004	TTI-11006	XR-11006	TTI-11006	XRC-11006
lbs/A[4]	4312	4338	4188	5037	4994	6588	6581
	P = 0.7624 CV = 7.03			P = 0.7596 CV = 3.63		P = 0.9823 CV = 6.36	

[1]JD4630, 90' boom, 15" nozzle spacing, 12.0 MPH, 12 GPA, 28 PSI, 36" boom height
[2]JD4730, 100' boom, 15" nozzle spacing, 11.6 MPH, 15 GPA, 18-20 PSI, 36" boom height
[3]JD4730, 90' boom, 20" nozzle spacing, 12.5 MPH, 20 GPA, 42-57 PSI, 36" boom height
[4]Adjusted to 10% moisture.

Summary - 2019

- Spray card analysis
  - *VMD_{50} larger with auxin nozzles (381-481 microns vs. 182-348 microns)*
  - *Coverage better with auxin nozzles in 2/3 tests*
- No differences in weeds, insects, disease, and yield between nozzles were observed in large, on-farm field trials.

Conclusions

- 6 on-farm, large plot replicated trials in 2018 and 2019
  - *+ 4 site-years small-plot (weed control)*
- No differences between nozzle type for insects, disease, weeds, and yield.
- Suggestions
  - *use at least 12 GPA*
  - *good rotations*
  - *timely applications*
  - *grass control??*

Worth Co.
09/24/19

Questions/Comments

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