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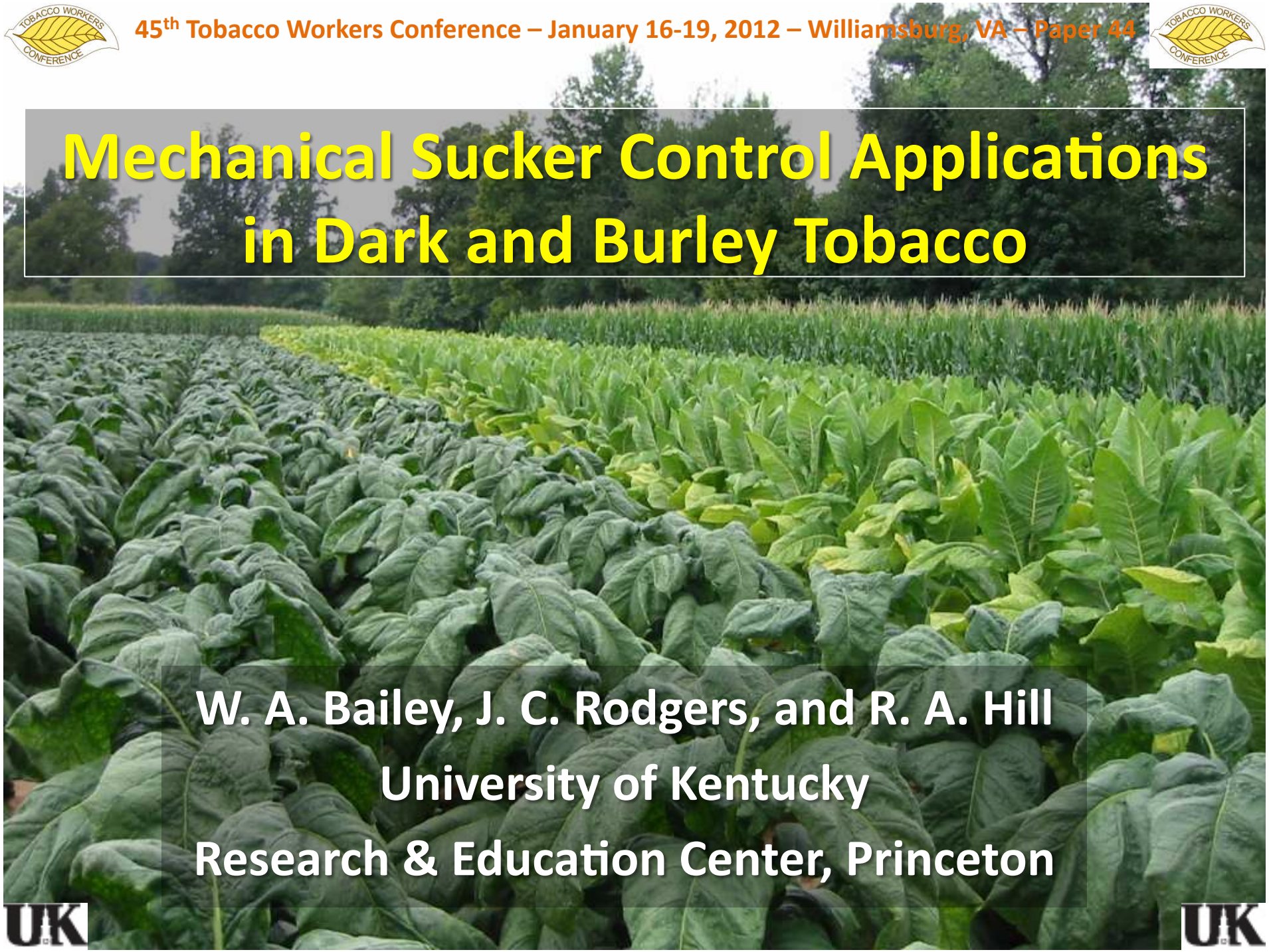
Mechanical Sucker Control Applications in Dark and Burley Tobacco



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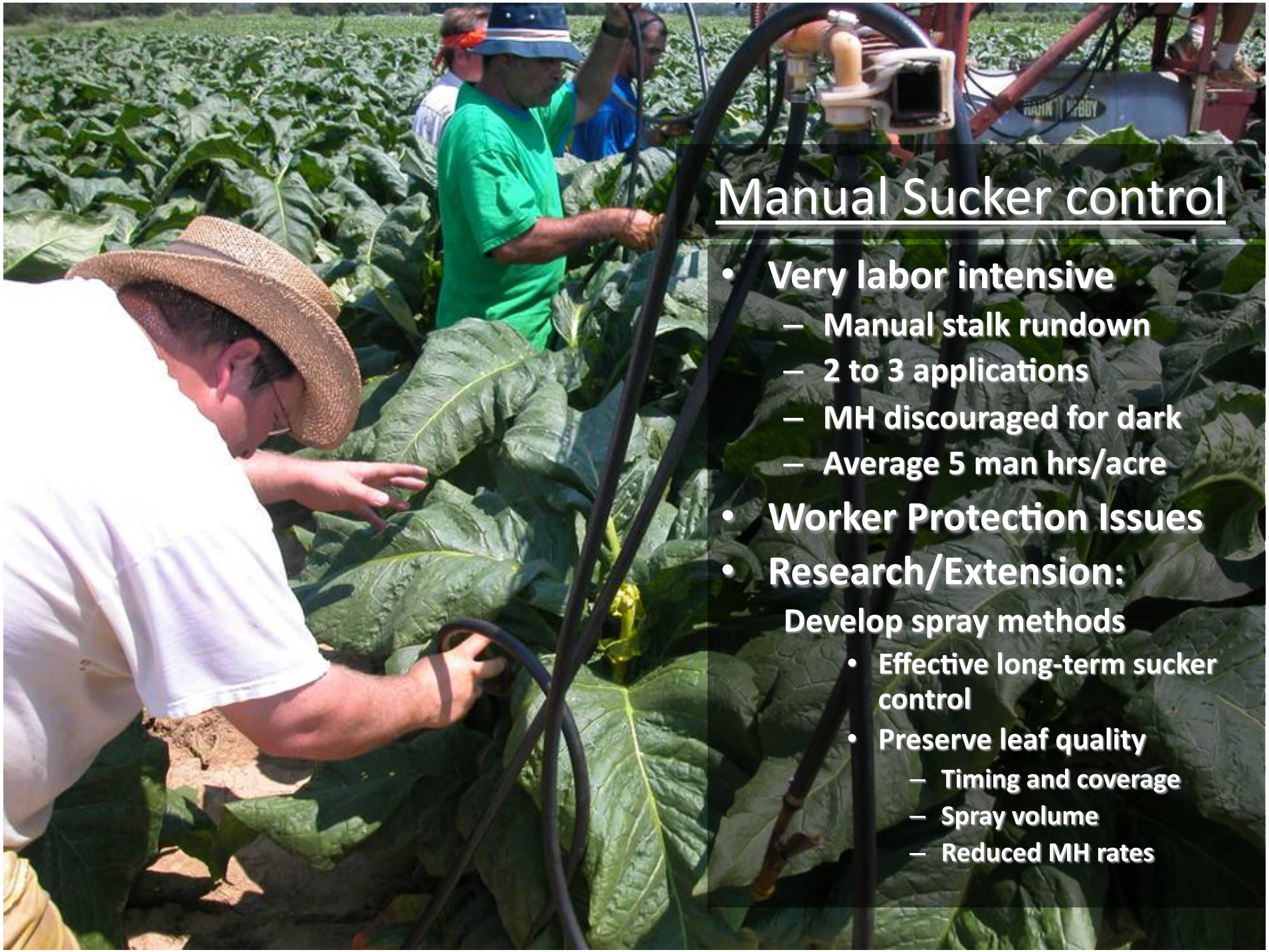
Sucker Growth in Dark and Burley Tobacco



Manual Sucker control

- **Very labor intensive**
  - Manual stalk rundown
  - 2 to 3 applications
  - MH discouraged for dark
  - Average 5 man hrs/acre
- **Worker Protection Issues**
- **Research/Extension:**

  Develop spray methods
  - Effective long-term sucker control
  - Preserve leaf quality
    - Timing and coverage
    - Spray volume
    - Reduced MH rates

2011 Dark Tobacco Sucker Control Trial

MSU West Farm, Murray, KY

- **Objectives:**
  1) Compare sucker control from various treatments including contacts, local systemics, and MH when applied mechanically with standard 3-nozzle/row applications or with conveyor hoods.
  2) Compare sucker control with standard rates of MH, reduced rates of MH, and non-MH systems.

- PD 7309LC dark tobacco transplanted June 14
  - 40” rows, 32” plant spacing = 4900 plants/acre
- Topped August 17, harvested October 6
- Plots 4 rows, 40 ft. long, 4 replications
  - All 4 rows treated, data collected from center 2 rows
  - All applications made at 60 gal/A with and without conveyor

Suckercides Tested

- Contact:
  - Off-shoot T (OST) – C_6 - C_8 - C_{10} - C_{12} fatty alcohols
- Local systemics
  - Flupro (flumetralin) – 1.2 lbs ai/gal
  - Butralin – 3 lbs ai/gal
- Systemic - maleic hydrazide
  - Royal MH-30 – 1.5 lbs ai/gal

Conveyor Spray Hoods

- Funnel device that fits over standard 3-nozzle system to concentrate spray closer to stalk.
- Potential advantages:
  - Better coverage on leaf axils on stalk
  - Less leaf exposure could mean less residues
- Potential disadvantage:
  - Narrower treated width, straight tobacco more critical

2011 Dark Tobacco Sucker Control Trial

MSU West Farm, Murray, KY - Treatments

Trt	Treatment	Rate (gal/A)	Application Method	Timing
1	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1.5 gal+0.5 gal	Standard 3-nozzle	1 wk pretop fb top fb 1 wk post top
2	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1.5 gal+0.5 gal	Standard with conveyor	1 wk pretop fb top fb 1 wk post top
3	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1 gal+0.5 gal	Standard 3-nozzle	1 wk pretop fb top fb 1 wk post top
4	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1 gal+0.5 gal	Standard with conveyor	1 wk pretop fb top fb 1 wk post top
5	OST fb OST fb MH	2 gal fb 2 gal fb 1.5 gal	Standard 3-nozzle	1 wk pretop fb top fb 1 wk post top
6	OST fb OST fb MH	2 gal fb 2 gal fb 1.5 gal	Standard with conveyor	1 wk pretop fb top fb 1 wk post top
7	OST fb OST fb OST+Flupro fb OST+Flupro	2 gal fb 2 gal fb 2 gal+0.5 gal fb 2 gal +0.5 gal	Standard 3-nozzle	1 wk pretop fb top fb 1 wk post top fb 2 wk post top
8	OST fb OST fb OST+Flupro fb OST+Flupro	2 gal fb 2 gal fb 2 gal+0.5 gal fb 2 gal +0.5 gal	Standard with conveyor	1 wk pretop fb top fb 1 wk post top fb 2 wk post top
9	OST fb OST fb OST+Butralin fb OST+Butralin	2 gal fb 2 gal fb 2 gal+0.5 gal fb 2 gal +0.5 gal	Standard 3-nozzle	1 wk pretop fb top fb 1 wk post top fb 2 wk post top
10	OST fb OST fb OST+Butralin fb OST+Butralin	2 gal fb 2 gal fb 2 gal+0.5 gal fb 2 gal +0.5 gal	Standard with conveyor	1 wk pretop fb top fb 1 wk post top fb 2 wk post top
11	1 OST	2 gal	Standard	1 wk pretop

2011 Dark Tobacco Sucker Control Trial

MSU West Farm, Murray, KY – Preharvest Sucker Control

Trt	Treatment	Rate (gal/A)	Application Method	% Sucker Control	#Plants w/ suckers/ 30	Sucker Wt (lbs)/10 plants
1	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1.5 gal+0.5 gal	Standard 3-nozzle	93 a	2 e	4.4 d
2	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1.5 gal+0.5 gal	Standard with conveyor	86 b	4 e	4.3 d
3	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1 gal+0.5 gal	Standard 3-nozzle	83 b	5 e	11.8 cd
4	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1 gal+0.5 gal	Standard with conveyor	85 b	5 e	5.6 d
5	OST fb OST fb MH	2 gal fb 2 gal fb 1.5 gal	Standard 3-nozzle	87 ab	4 e	5.5 d
6	OST fb OST fb MH	2 gal fb 2 gal fb 1.5 gal	Standard with conveyor	84 b	4 e	5.2 d
7	OST fb OST fb OST+Flupro fb OST+Flupro	2 gal fb 2 gal fb 2 gal+0.5 gal fb 2 gal+0.5 gal	Standard 3-nozzle	48 de	22 bc	23.1 ab
8	OST fb OST fb OST+Flupro fb OST+Flupro	2 gal fb 2 gal fb 2 gal+0.5 gal fb 2 gal+0.5 gal	Standard with conveyor	54 c	18 d	21.6 ab
9	OST fb OST fb OST+Butralin fb OST+Butralin	2 gal fb 2 gal fb 2 gal+0.5 gal fb 2 gal+0.5 gal	Standard 3-nozzle	46 e	23 b	22.4 ab
10	OST fb OST fb OST+Butralin fb OST+Butralin	2 gal fb 2 gal fb 2 gal+0.5 gal fb 2 gal+0.5 gal	Standard with conveyor	53 cd	19 cd	16.4 bc
11	1 OST	2 gal	Standard	16 f	30 a	27.0 a

Dark Tobacco Sucker Control

MH and non-MH treatments with and without Conveyors

2011 – MSU West Farm, Murray, KY

OST fb OST fb
MH (1.5) + Flupro (0.5)
Standard Spray

OST fb OST fb
MH (1.5) + Flupro (0.5)
Conveyor

OST fb OST fb
OST + Flupro fb
OST + Flupro
Standard Spray

OST fb OST fb
OST + Flupro fb
OST + Flupro
Conveyor

2011 Dark Tobacco Sucker Control Trial

MSU West Farm, Murray, KY – Dark Fire-Cured Tobacco Yield

Trt	Treatment	Rate (gal/A)	Application Method	Lug Yld (lbs/A)	Second Yld (lbs/A)	Leaf Yld (lbs/A)	*Total Yld (lbs/A)*
1	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1.5 gal+0.5 gal	Standard 3-nozzle	333 a	611 a	2524 a	*3467 a*
2	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1.5 gal+0.5 gal	Standard with conveyor	426 a	481 a	2499 a	*3406 ab*
3	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1 gal+0.5 gal	Standard 3-nozzle	418 a	643 a	2091 bc	*3152 bc*
4	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1 gal+0.5 gal	Standard with conveyor	399 a	590 a	2372 ab	*3362 ab*
5	OST fb OST fb MH	2 gal fb 2 gal fb 1.5 gal	Standard 3-nozzle	417 a	647 a	2122 bc	*3185 abc*
6	OST fb OST fb MH	2 gal fb 2 gal fb 1.5 gal	Standard with conveyor	457 a	706 a	2125 bc	*3288 ab*
7	OST fb OST fb OST+Flupro fb OST+Flupro	2 gal fb 2 gal fb 2 gal+0.5 gal fb 2 gal +0.5 gal	Standard 3-nozzle	383 a	461 a	1994 c	*2839 de*
8	OST fb OST fb OST+Flupro fb OST+Flupro	2 gal fb 2 gal fb 2 gal+0.5 gal fb 2 gal +0.5 gal	Standard with conveyor	390 a	447 a	2059 c	*2896 cde*
9	OST fb OST fb OST +Butralin fb OST+Butralin	2 gal fb 2 gal fb 2 gal+0.5 gal fb 2 gal +0.5 gal	Standard 3-nozzle	336 a	635 a	1682 d	*2652 ef*
10	OST fb OST fb OST +Butralin fb OST+Butralin	2 gal fb 2 gal fb 2 gal+0.5 gal fb 2 gal +0.5 gal	Standard with conveyor	419 a	533 a	2019 c	*2971 cd*
11	1 OST	2 gal	Standard	359 a	503 a	1633 d	*2495 f*

2011 Burley Tobacco Sucker Control Trial
MSU West Farm, Murray, KY

- **Objectives:**
  1) Compare sucker control with standard and reduced rates of MH with Flupro applied with and without conveyor hoods.
  2) Compare MH residues in burley tobacco where MH was applied with and without conveyor hoods.

- NC 7 LC burley tobacco transplanted June 14
  - 40” rows, 32” plant spacing = 4900 plants/acre
- Topped August 17, harvested September 23
- Plots 4 rows, 40 ft. long, 4 replications
  - All 4 rows treated, data collected from center 2 rows
  - All applications made at 60 gal/A with and without conveyor

2011 Burley Tobacco Sucker Control Trial

MSU West Farm, Murray, KY - Treatments

Trt	Treatment	Rate (gal/A)	Application Method	Timing
1	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1.5 gal+0.5 gal	Standard 3-nozzle	1 wk pretop fb top fb 1 wk post top
2	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1.5 gal+0.5 gal	Standard with conveyor	1 wk pretop fb top fb 1 wk post top
3	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1 gal+0.5 gal	Standard 3-nozzle	1 wk pretop fb top fb 1 wk post top
4	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1 gal+0.5 gal	Standard with conveyor	1 wk pretop fb top fb 1 wk post top
5	1 OST	2 gal	Standard	1 wk pretop

2011 Burley Tobacco Sucker Control Trial

MSU West Farm, Murray, KY – Preharvest Sucker Control

Trt	Treatment	Rate (gal/A)	Application Method	% Sucker Control	#Plants w/ suckers/ 30	Sucker Wt (lbs)/10 plants
1	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1.5 gal+0.5 gal	Standard 3-nozzle	98 a	1 b	3.4 b
2	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1.5 gal+0.5 gal	Standard with conveyor	95 a	2 b	6.2 b
3	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1 gal+0.5 gal	Standard 3-nozzle	93 a	3 b	5.2 b
4	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1 gal+0.5 gal	Standard with conveyor	94 a	2 b	5.7 b
5	1 OST	2 gal	Standard	28 b	20 a	69.3 a

Burley Tobacco Sucker Control

Standard and Reduced MH treatments with and without Conveyors

2011 – MSU West Farm, Murray, KY

OST fb OST fb
MH (1.5) + Flupro (0.5)
Standard Spray

OST fb OST fb
MH (1.5) + Flupro (0.5)
Conveyor

OST fb OST fb
MH (1.0) + Flupro (0.5)
Standard Spray

OST fb OST fb
MH (1.0) + Flupro (0.5)
Conveyor

2011 Burley Tobacco Sucker Control Trial

MSU West Farm, Murray, KY – Burley Tobacco Yield

Trt	Treatment	Rate (gal/A)	Application Method	Flyings (lbs/A)	Cutters (lbs/A)	Leaf (lbs/A)	Tips (lbs/A)	*Total (lbs/A)*
1	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1.5 gal+0.5 gal	Standard 3-nozzle	268 c	447 ab	1506 a	398 ab	*2620 a*
2	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1.5 gal+0.5 gal	Standard with conveyor	288 bc	460 ab	1368 a	394 ab	*2510 a*
3	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1 gal+0.5 gal	Standard 3-nozzle	302 ab	508 a	1333 ab	406 ab	*2548 a*
4	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1 gal+0.5 gal	Standard with conveyor	322 a	491 a	1438 a	422 a	*2672 a*
5	1 OST	2 gal	Standard	293 abc	403 b	1103 b	343 b	*2141 b*

2011 Burley Tobacco Sucker Control Trial

MSU West Farm, Murray, KY – MH Cured Leaf Residues

Trt	Treatment	Rate (gal/A)	Application Method	Flyings ppm *(range)*	Cutters ppm *(range)*	Leaf ppm *(range)*	Tips ppm *(range)*
1	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1.5 gal+0.5 gal	Standard 3-nozzle	17.5 *(BDL-24)*	25.0 *(BDL-52)*	37.5 *(28-56)*	89.75 *(51-122)*
2	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1.5 gal+0.5 gal	Standard with conveyor	BDL	13.0 *(BDL-22)*	23.5 *(BDL-39)*	73.75 *(62-84)*
3	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1 gal+0.5 gal	Standard 3-nozzle	15.0 *(BDL-30)*	18.5 *(BDL-43)*	23.25 *(BDL-46)*	49.5 *(33-62)*
4	OST fb OST fb MH + Flupro	2 gal fb 2 gal fb 1 gal+0.5 gal	Standard with conveyor	12.5 *(BDL-20)*	17.0 *(BDL-29)*	10.0 *(BDL-15)*	26.0 *(BDL-47)*

*BDL = below detectable limit.

Summary

- **Dark:**
  - Only MH-containing treatments provided acceptable sucker control
    - Sucker control in non-MH treatments was approximately half that of MH treatments.
  - No major effect of conveyor hoods in MH treatments
  - Slightly better sucker control in non-MH treatments when conveyors were used
  - Better sucker control in MH treatments resulted in much better yields also
    - Average total yield/A of MH treatments = 3310 lbs/A
    - Average total yield/A of non-MH treatments = 2840 lbs/A

Summary

- **Burley:**
  - Reducing MH application rates to 1 gal/A in combination with 0.5 gal local systemic can provide sucker control comparable to 1.5 gal/A MH in some seasons
  - Sucker control from applications made with conveyor hoods was comparable to standard spray applications.
  - Average total yield/A = 2588 lbs/A

Summary

- **Burley MH residues:**
  - MH residue reduced in leaf and tips with lower rate of 1 gal/A
    - Average 81.75 ppm in tips with 1.5 gal/A Royal MH-30
    - Average 37.75 ppm in tips with 1.0 gal/A Royal MH-30
  - MH residue reduced in leaf and tips with use of conveyors
    - Average 69.63 ppm in tips with standard spray
    - Average 49.88 ppm in tips with conveyor

Acknowledgements

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