

A photograph of a vast field of dark tobacco plants under a clear sky. The plants are lush green and densely packed in rows. In the background, a long, low building with a blue roof is visible against the horizon.

***Evaluation of Foliar Applications of
Indoxacarb (Steward) and Other Insecticides
for Flea Beetle Control in Dark Tobacco***

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Flea Beetle (*Epitrix hiritipennis*)



- Major season-long concern in cigar wrapper tobacco
- Late-season concern in dark fire-cured tobacco
 - 15-16 weeks in the field, 6-7 weeks after topping
- Imidacloprid (Admire Pro) still seems to be effective in tray drench and transplant water applications
 - Admire Pro and Platinum products very effective
 - When transplanting under moist conditions, plant uptake may be better from tray drench applications than transplant water applications
 - Control only last for first half of season (8 weeks)
- Late-season fleabeetles have been a problem in certain seasons

Flea Beetle (*Epitrix hirtipennis*)



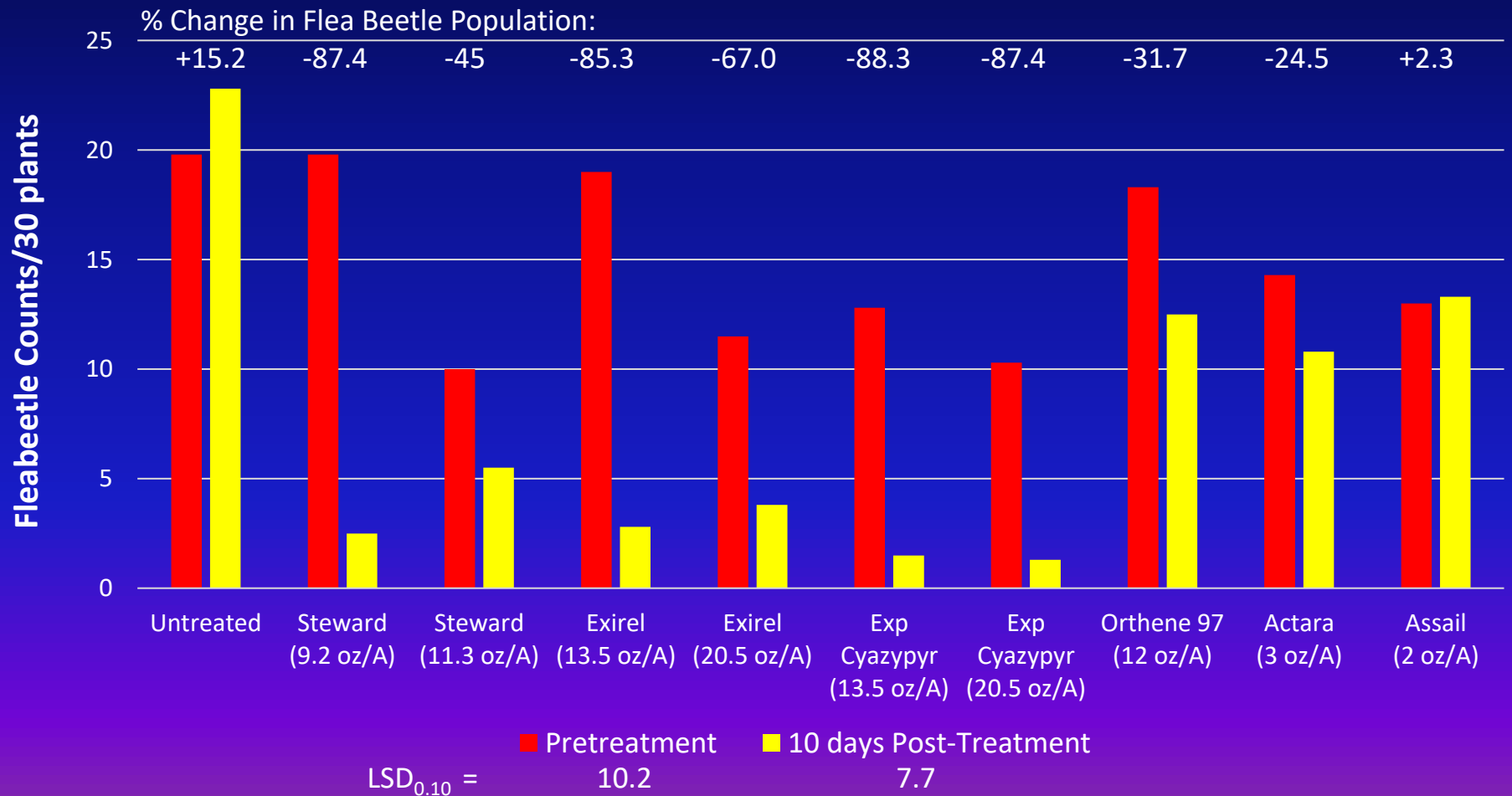
- Late-season infestations more difficult to control?
 - Later generations more confined to lower part of plant where nicotine concentrations are lower
 - More difficult to reach with standard spray application
 - Typical insecticide applications made at 15-20 gal/A
 - Should late season flea beetle applications be made at higher volumes?
 - 30-40 gal/A



2019 Flea Beetle Insecticide Trial

UKREC, Princeton KY – 15 gal/A applications

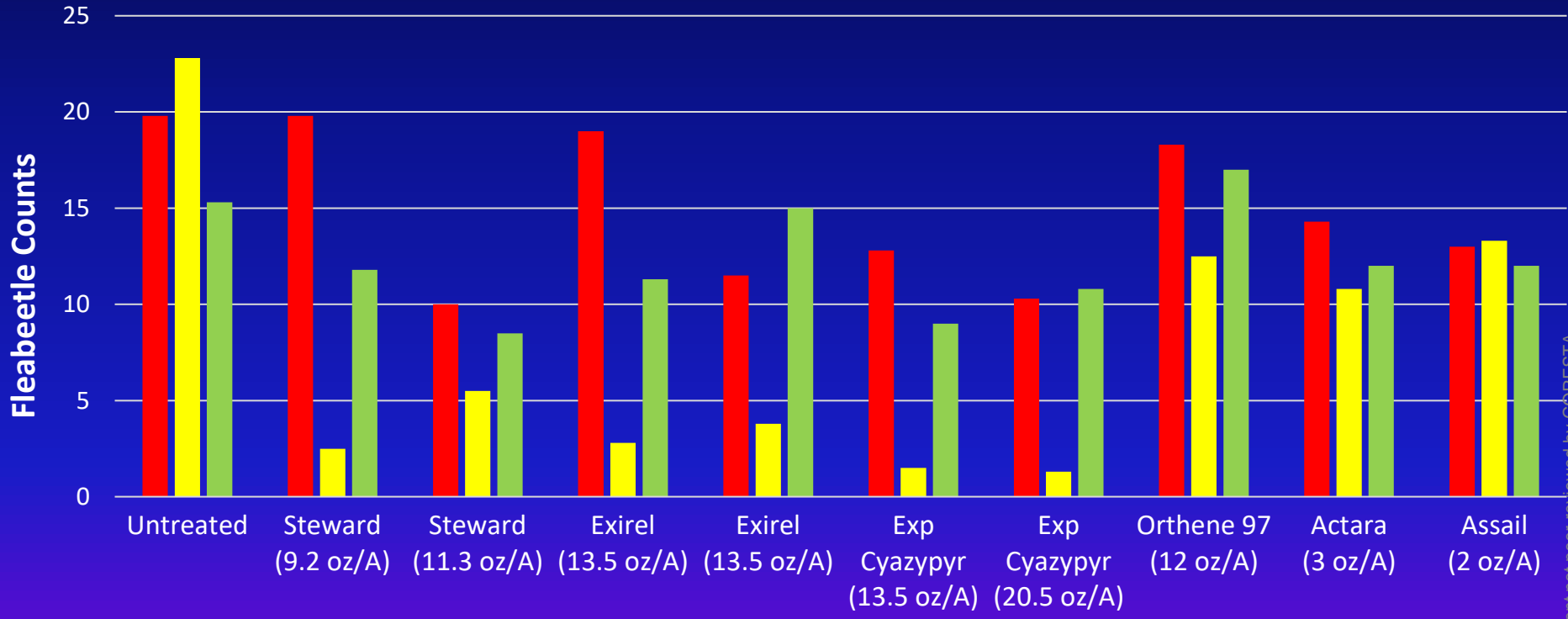
Flea Beetle Counts per 30 plants – Pre- and Post-Treatment



2019 Flea Beetle Insecticide Trial

UKREC, Princeton KY – 15 gal/A applications

Flea Beetle Counts – Pre- and Post-Treatment (30 plants/plot), Preharvest (6 plants/plot)



■ Pretreatment
 ■ 10 days Post-Treatment
 ■ Preharvest (4 wk post-treatment)

LSD_{0.10} = 10.2 7.7 6.1

Residual Insecticides at Transplanting for Flea Beetle Control

Insecticide	Application Method
Admire (imidacloprid)	Tray Drench or Transplant Water
Platinum (thiamethoxam)	Tray Drench or Transplant Water
Durivo (Platinum + Coragen)	Transplant Water
Verimark (cyantraniliprole)	Transplant Water
Orthene (acephate)	Transplant Water

Options for Foliar Fleabeetle Control

Insecticide	Rate/A	PHI
Orthene 97	½ to 1 lb/A	Depends on buyer
Actara 25WDG	2 to 3 oz/A	14 day
Assail 30SG	2.5 to 4 oz/A	7 day
Admire Pro	1.4 oz/A	14 day
Voliam Flexi	2.5 to 4 oz/A	14 day
Belay	3 to 4 oz/A	14 day
Exirel	13.5 to 20.5 oz/A	7 day
Besiege	5 to 10 oz/A	40 day
Warrior	1 to 2 oz/A	40 day
Capture	3.5 to 8.5 oz/A	Layby

Flea Beetle Thresholds for Burley and Dark Tobacco

Scouting recommendation

Scout at least every 10 days throughout the season
Count fleabeetles on at least 6 plants per field

Time Period	Flea Beetles per Plant to Justify Treatment
First 2 weeks after transplanting	4 or more per plant
2 to 4 weeks after transplanting	10 or more per plant
After 4 weeks	60 or more per plant

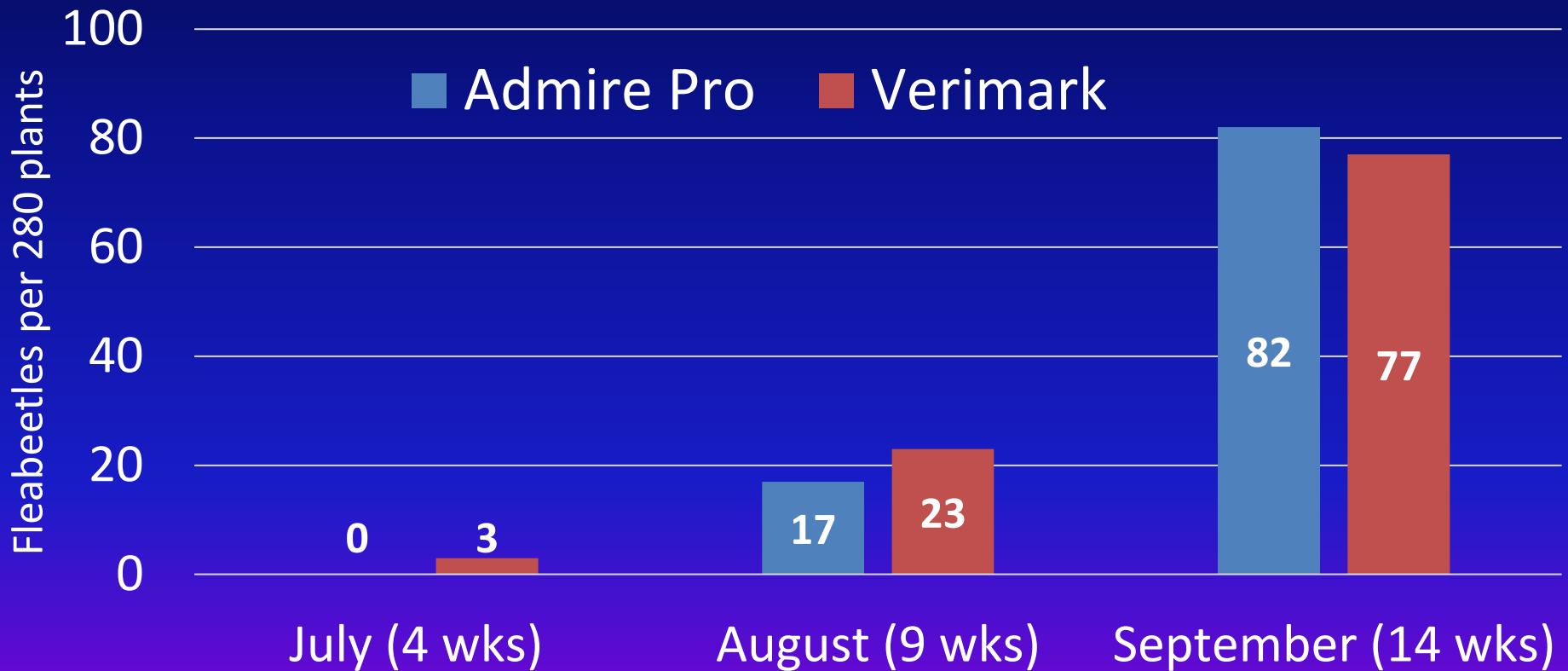
2020 Tray Drench Flea Beetle Insecticide Comparison

Murray, KY

- Tray drench applications 1 day prior to transplant
 - Admire Pro (imidicloprid) – 0.5 oz per 1000 plants
 - Verimark (cyantraniliprole) – 13.5 oz per acre
 - 2.7 oz per 1000 plants for dark tobacco population of 5000 plants/acre
 - Each treatment applied uniformly to 2 trays and washed in
 - KTD17LC dark tobacco set June 18
 - 2-row plots, 280 plants per treatment
 - Monthly fleabeetle counts made at 4, 9 and 14 weeks
 - July, August, September

2020 Tray Drench Flea Beetle Insecticide Evaluation

Murray, KY



*Fleabeetle control from tray drench applications of Admire Pro or Verimark are similar.

Steward EC Insecticide

- Indoxacarb
- Group 22, Oxadiazine class of insecticides
 - Voltage-dependent sodium channel blockers
- Effective on hornworm, budworm, and flea beetle
- Registered under 2(ee) label for tobacco in 2021
- 9.2 to 11.3 oz/A
- Maximum 4 applications per season
- 14 day PHI, 12 hour REI

2021 Flea Beetle Trial

UKREC, Princeton KY

Treatment	Active Ingredient	Product Rate/A	Application Volumes
Untreated	-	-	15 – 25 – 40 gal/A
Steward	Indoxacarb	9.2 oz/A	15 – 25 – 40 gal/A
Steward	Indoxacarb	11.3 oz/A	15 – 25 – 40 gal/A
Exirel	Cyantraniliprole	13.5 oz/A	15 – 25 – 40 gal/A
Blackhawk	Spinosad	1.6 oz/A	15 – 25 – 40 gal/A
Assail	Acetamiprid	4 oz/A	15 – 25 – 40 gal/A

2021 Flea Beetle Trial

UKREC, Princeton KY

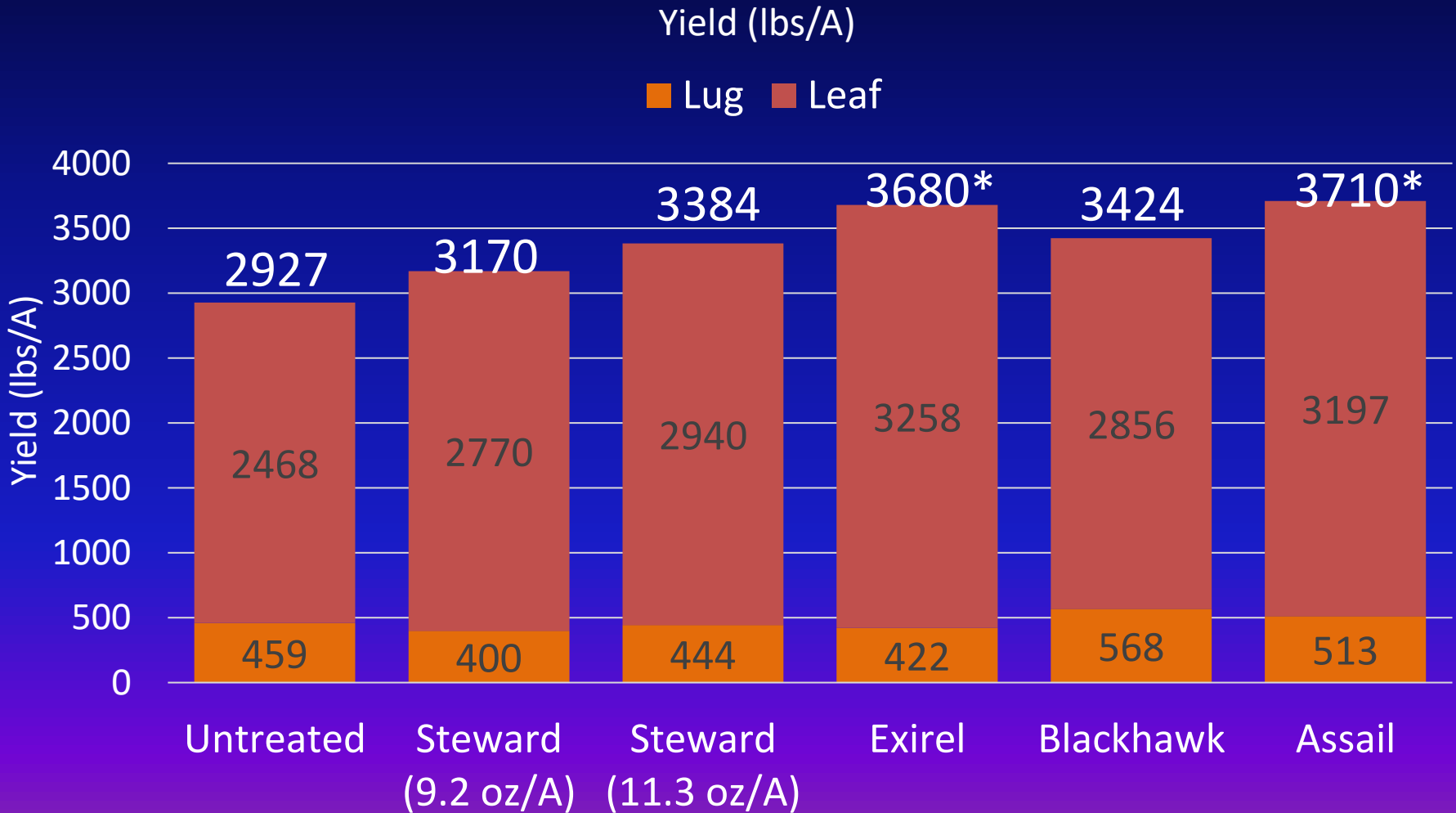
- No residual insecticides used at transplanting
 - No imidicloprid (Admire Pro)
 - No chlorantraniliprole (Coragen)
- RCBD with 3 replications of treatments
- 3-row plots, 2 rows sprayed with 1 row border between plots
- Fleabeetle and worm counts taken every 1-2 weeks from transplanting to harvest
 - 6 plants per plot counted

2021 Flea Beetle Counts (5 to 7 DAT)

Treatment	Rate	June 15 (15 gal/A)	July 7 (25 gal/A)	August 2 (40 gal/A)
	oz/A	----- Fleabeetles per 6 plants -----		
Untreated	-	13 a	50 a	21.7 a
Steward	9.2	0 c	4 b	0 b
Steward	11.3	1 c	3 b	0 b
Exirel	13.5	2 c	3 b	0 b
Blackhawk	1.6	7 b	53 a	2 b
Assail	4	4 bc	7 b	1 b
<i>LSD</i> _{0.10}		4	8	3

2021 Flea Beetle Trial

UKREC, Princeton KY – Dark-Fired Yield



Summary

- Verimark appears to provide similar flea beetle control to Admire Pro in tray drench applications.
- Foliar Steward applications controlled flea beetle similar to Exirel and Assail, and better than Blackhawk
- Control of late-season generation of flea beetle was good with increased spray volume of 40 gal/A.
- Highest yield from Exirel and Assail treatments
 - Both statistically higher than untreated

Acknowledgement: FMC Corporation



Dark Tobacco Website: darktobacco.ca.uky.edu
Facebook: Dark Tobacco in Kentucky & Tennessee