

Impact of Application Timing of Fungicides On the Management of Target Spot

Jared Walls

R.C. Kemerait, A. Fulmer, C. Perry, F. H. Sanders, S. Newell, L. Newsom

University of Georgia Cooperative Extension

Research Update



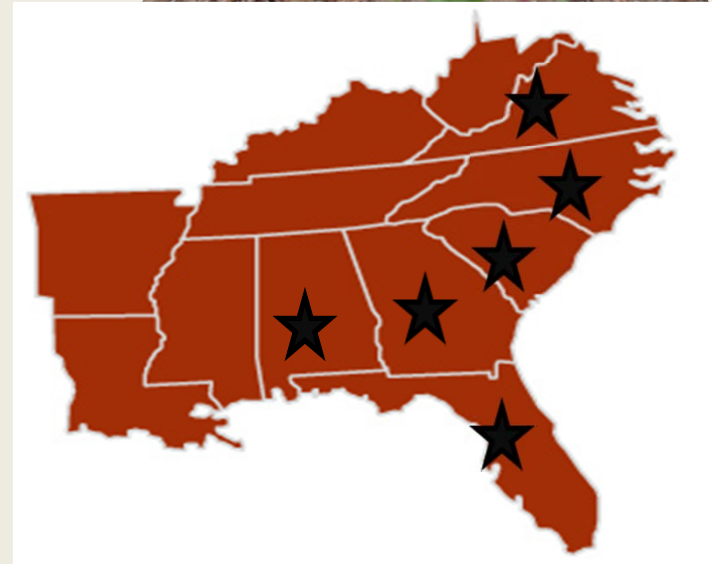
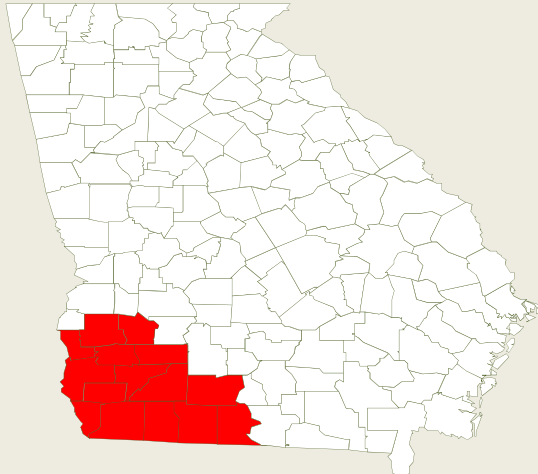
Importance of Foliar Diseases

- Historically foliar diseases (other than boll rot) were of minor importance in Georgia
 - Cercospora Leaf Spot
 - Ascochyta Blight
 - Areolate Mildew
 - Angular Leaf Spot
- Exception is Stemphylium Leaf Spot
 - Potassium deficiency is underlying cause
 - Less evidence of effective management with fungicides



Impact of Target Spot

- Since 2005, growers noticed a disease unrelated to potassium
- Symptoms associated with this disease
 - Premature defoliation
 - Severe spots on leaves, bolls, and bracts
 - Significant yield losses
- 2008, *Corynespora* leaf spot was distinguished from other foliar diseases
- 2012: FL, AL, NC, SC, and VA



Koch's Postulates for Proof of Target Spot

A. M. Fulmer, J. T. Walls, B. Dutta, V. Parkunan, J. Brock, and R. C. Kemerait, Jr., *First Report of Target Spot Caused by *Corynespora cassiicola* on Cotton in Georgia*, Plant Disease 2012 96:7, 1066-1066

- DP 555 and DP 1048
- Inoculated at 2-4 leaf stage
- Incubated in moist chamber at 21° C for 48 hours
- 100% of inoculated plants showed symptoms
- No symptoms found on non-inoculated plants
- Fungus was re-isolated, cultured, and confirmed by morphological characteristics and PCR



Objectives

- Best application timing for disease management
 - Disease onset
 - Growth stage (coverage)
 - Length of protection
- Quantify the effect that Target Spot has on yield

Description of Small Plot Trials

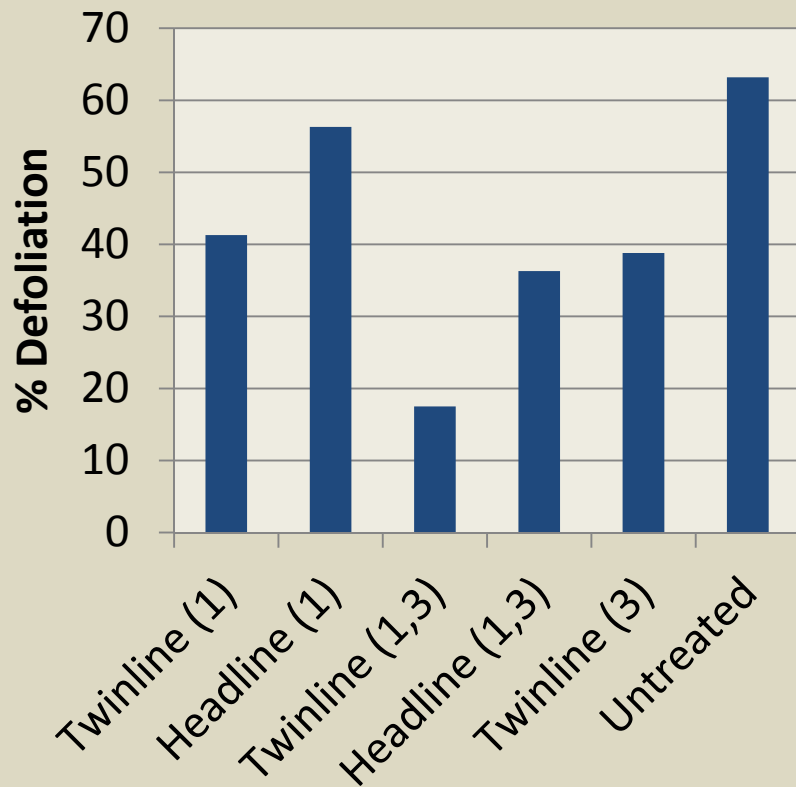
- Randomized and Replicated Studies (4-6 reps)
- Trials conducted on research stations in Tifton, Camilla (Stripling) , and Attapulcus
 - Camilla: did not cut alley until defoliation (Irrigated and Dryland)
- PHY 499
- Fungicides
 - Headline (pyraclostrobin)
 - Twinline (pyraclostrobin + metconazole)
 - Priaxor (pyraclostrobin + fluxapyroxad)
- Lee Spider
 - 8002 FF
 - 20 GPA
- Ratings
 - Defoliation (2012)
 - Yield (2012)
 - Florida 1-10 (2013)



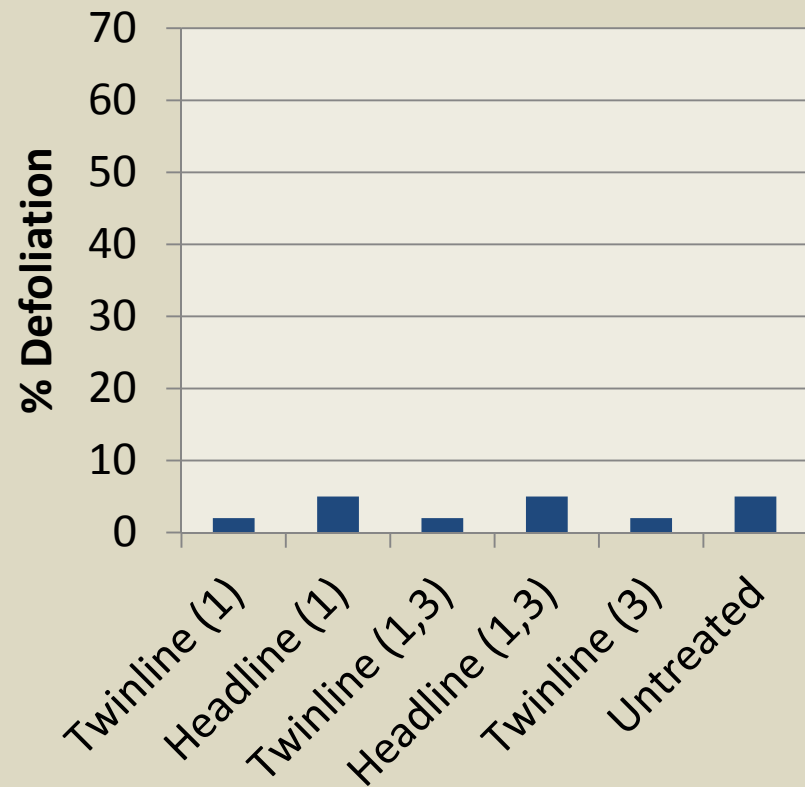
2012 Stripling Irrigation Park, Mitchell County

Target Spot

Overhead Irrigation



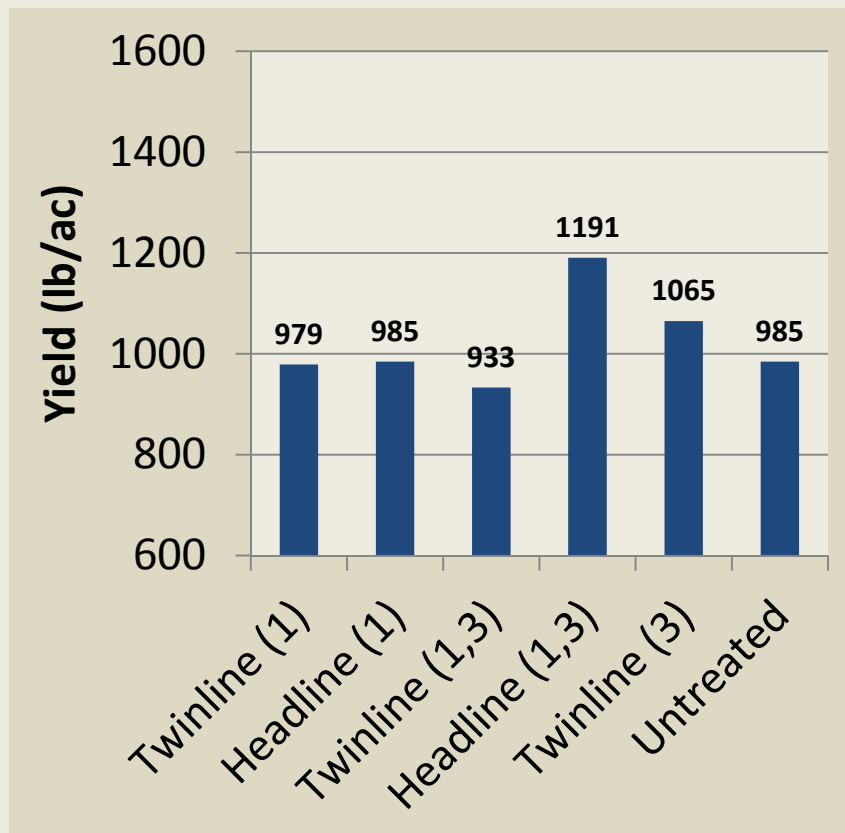
Dryland



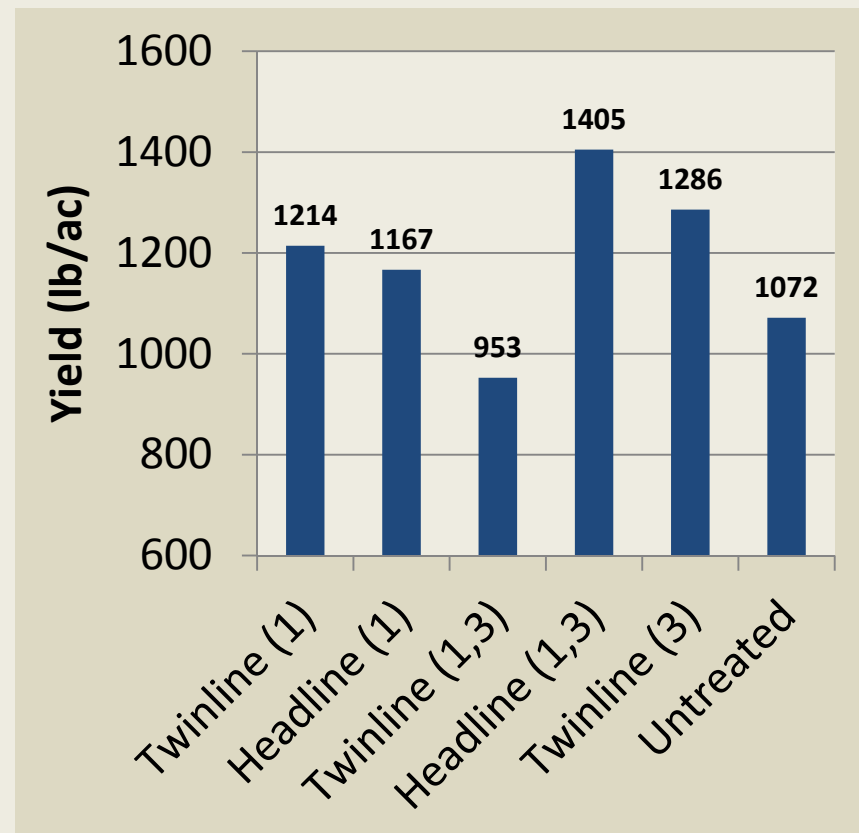
2012 Stripling Irrigation Park, Mitchell County

Target Spot

Overhead Irrigation

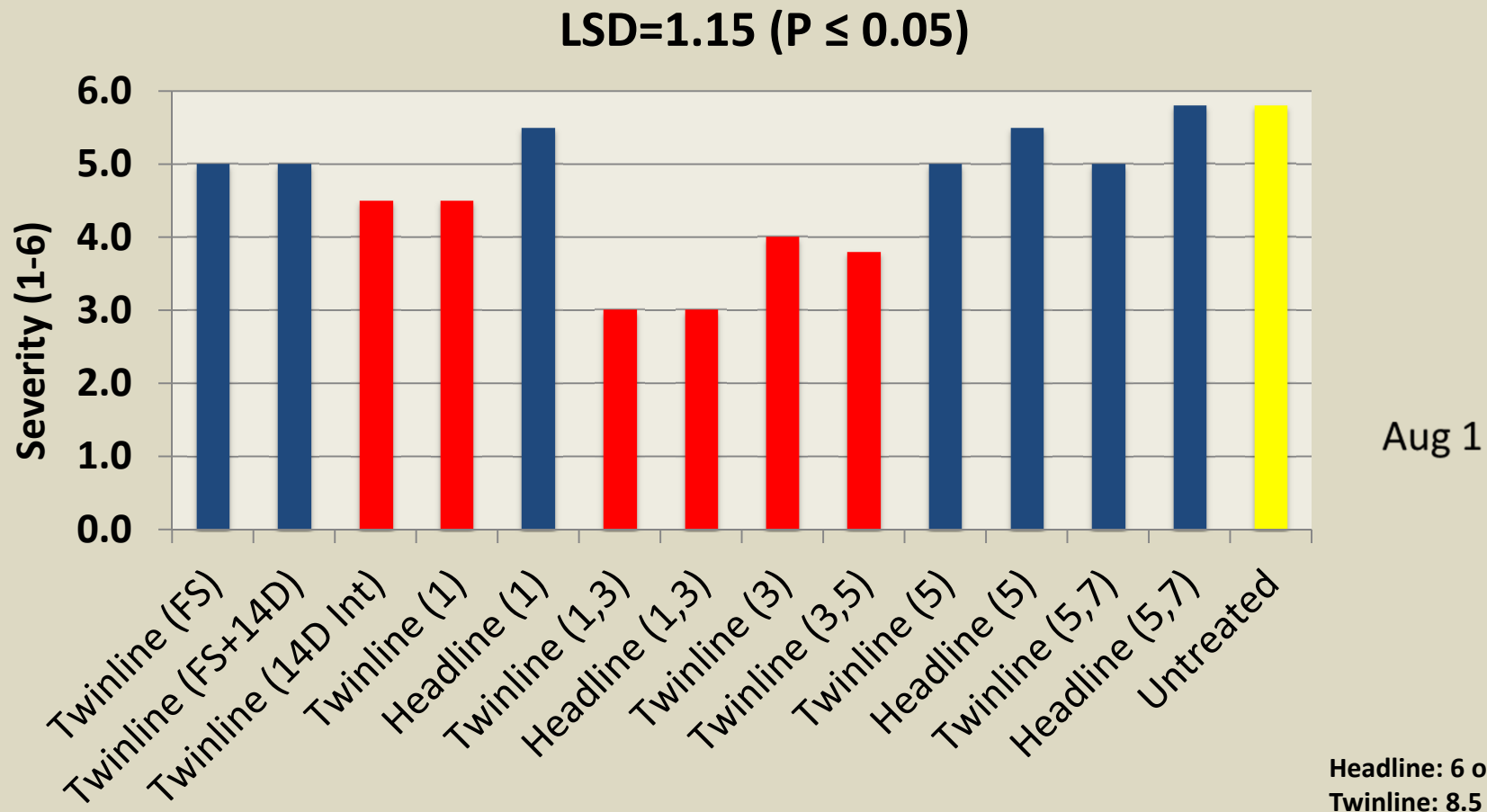


Dryland



2012 Stripling Irrigation Park, Mitchell County

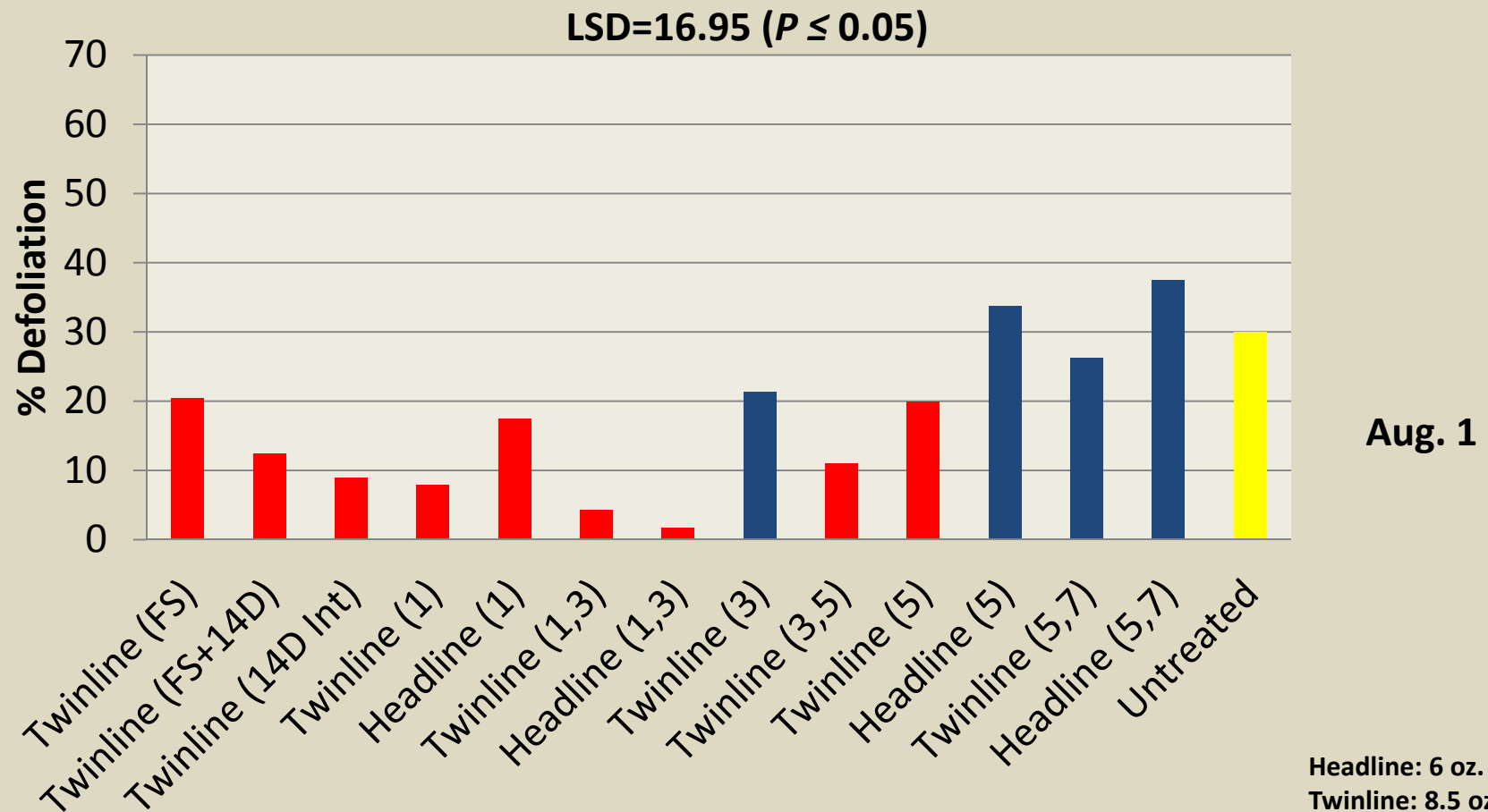
Target Spot



Planting date = May 3, First Bloom = July 10, Disease was first confirmed around June 20th
Last spray before rating: July 24 (3rd Week of Bloom)

2012 Stripling Irrigation Park, Mitchell County

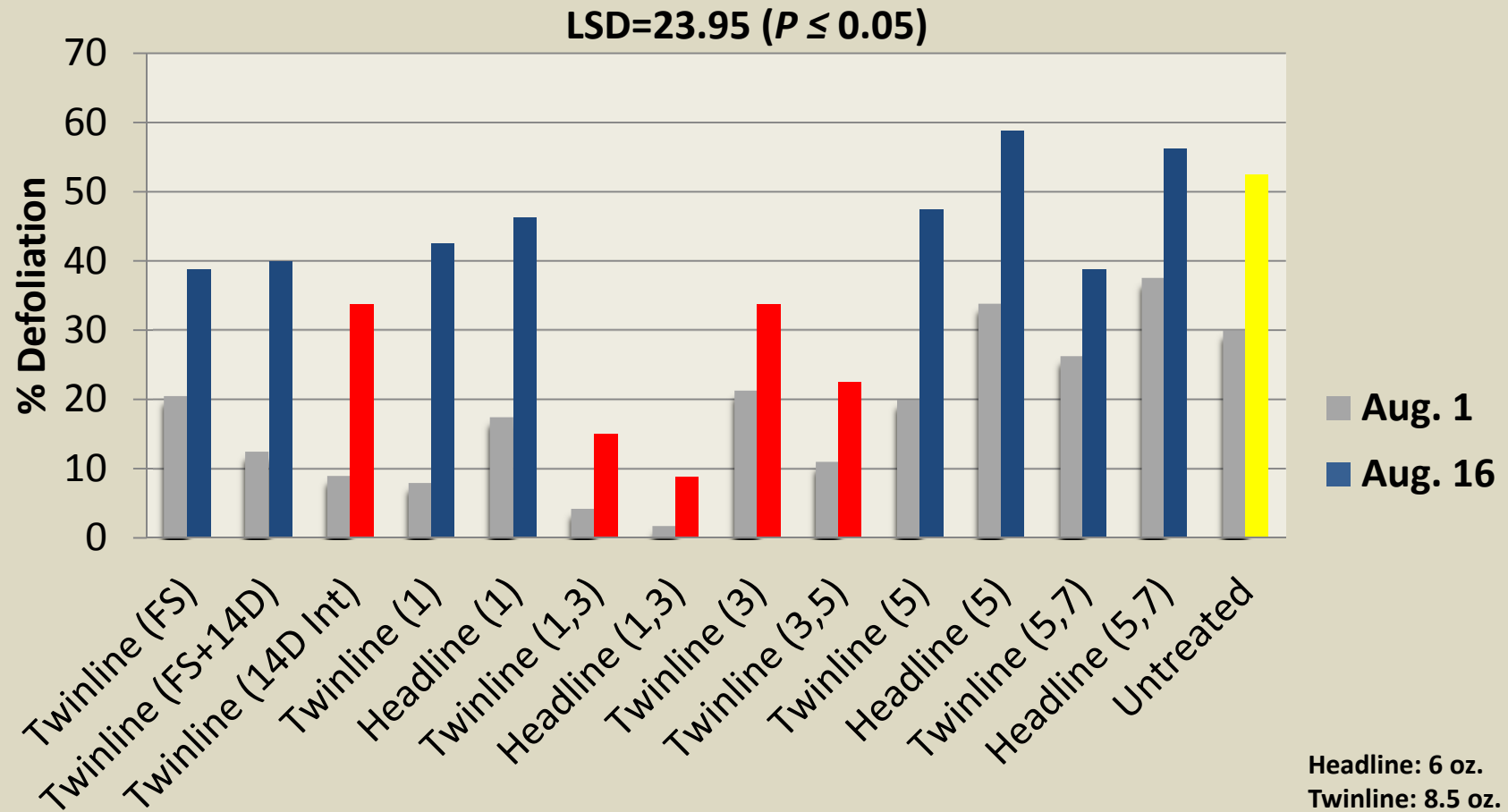
Target Spot



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2012 Stripling Irrigation Park, Mitchell County

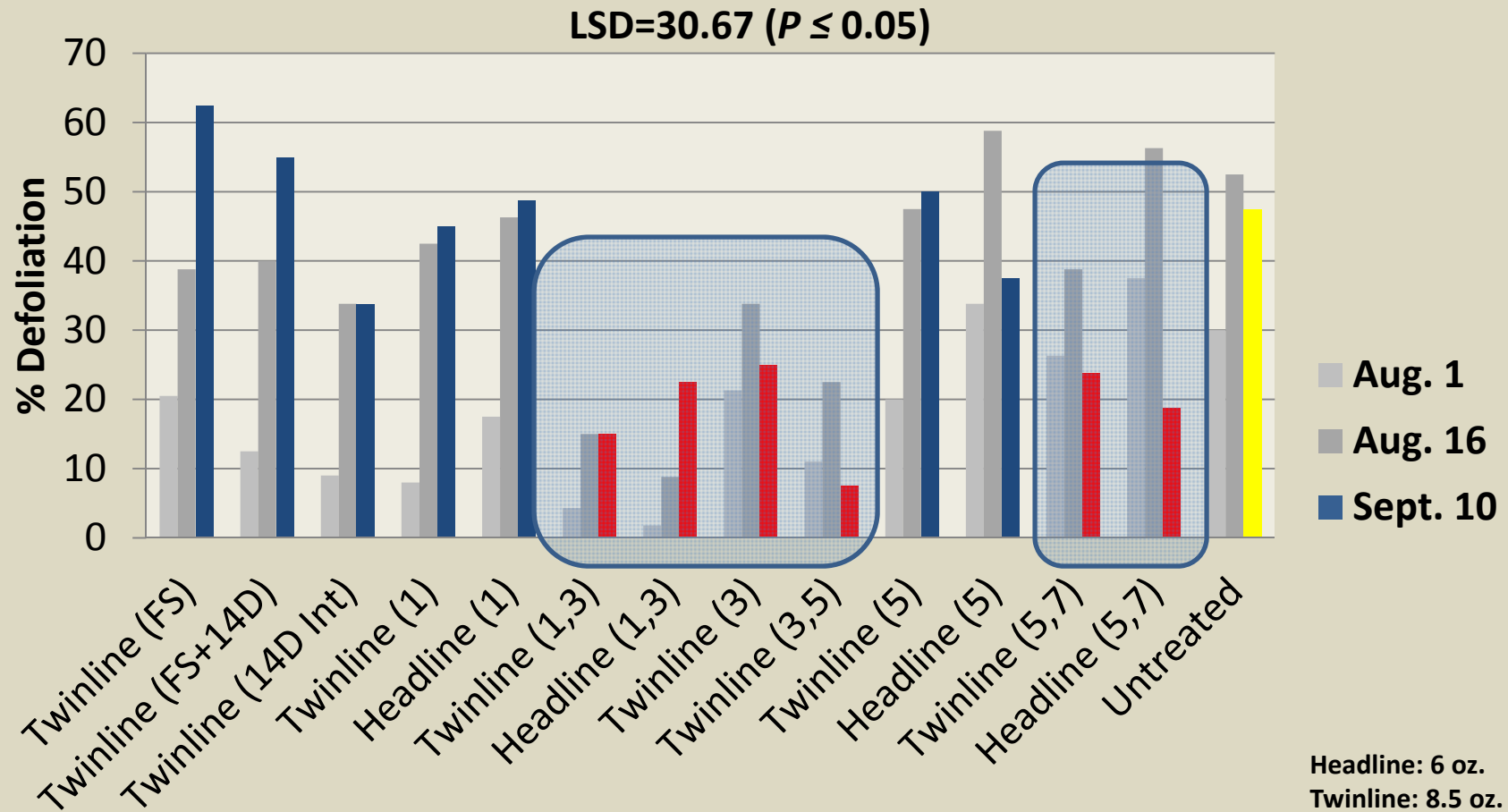
Target Spot



Planting date = May 3, First Bloom = July 10, Disease was first confirmed around June 20th
Last spray before rating: August 15 (5th Week of Bloom)

2012 Stripling Irrigation Park, Mitchell County

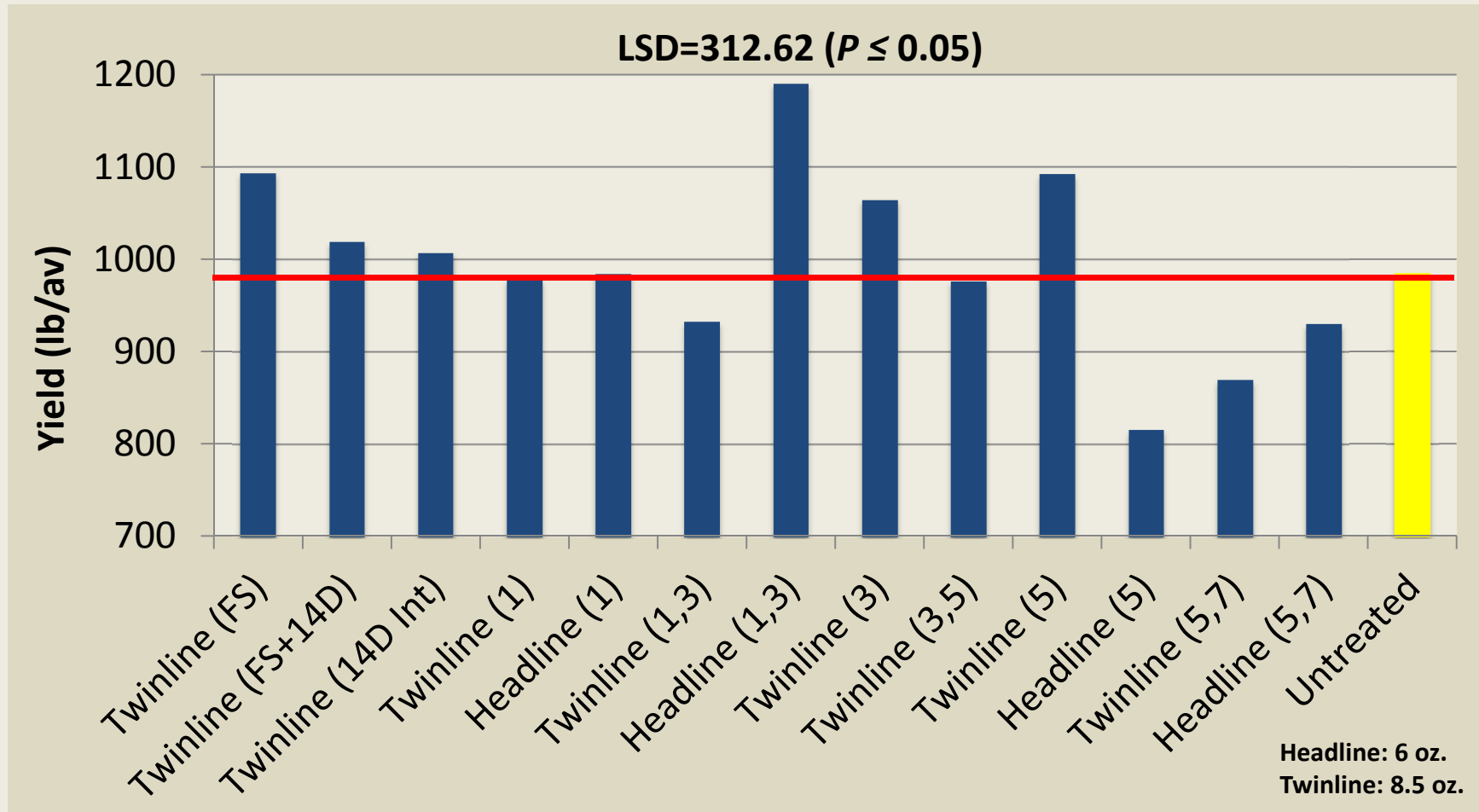
Target Spot



Planting date = May 3, First Bloom = July 10, Disease was first confirmed around June 20th
Last spray before rating: August 30 (7th Week of Bloom)

2012 Stripling Irrigation Park, Mitchell County

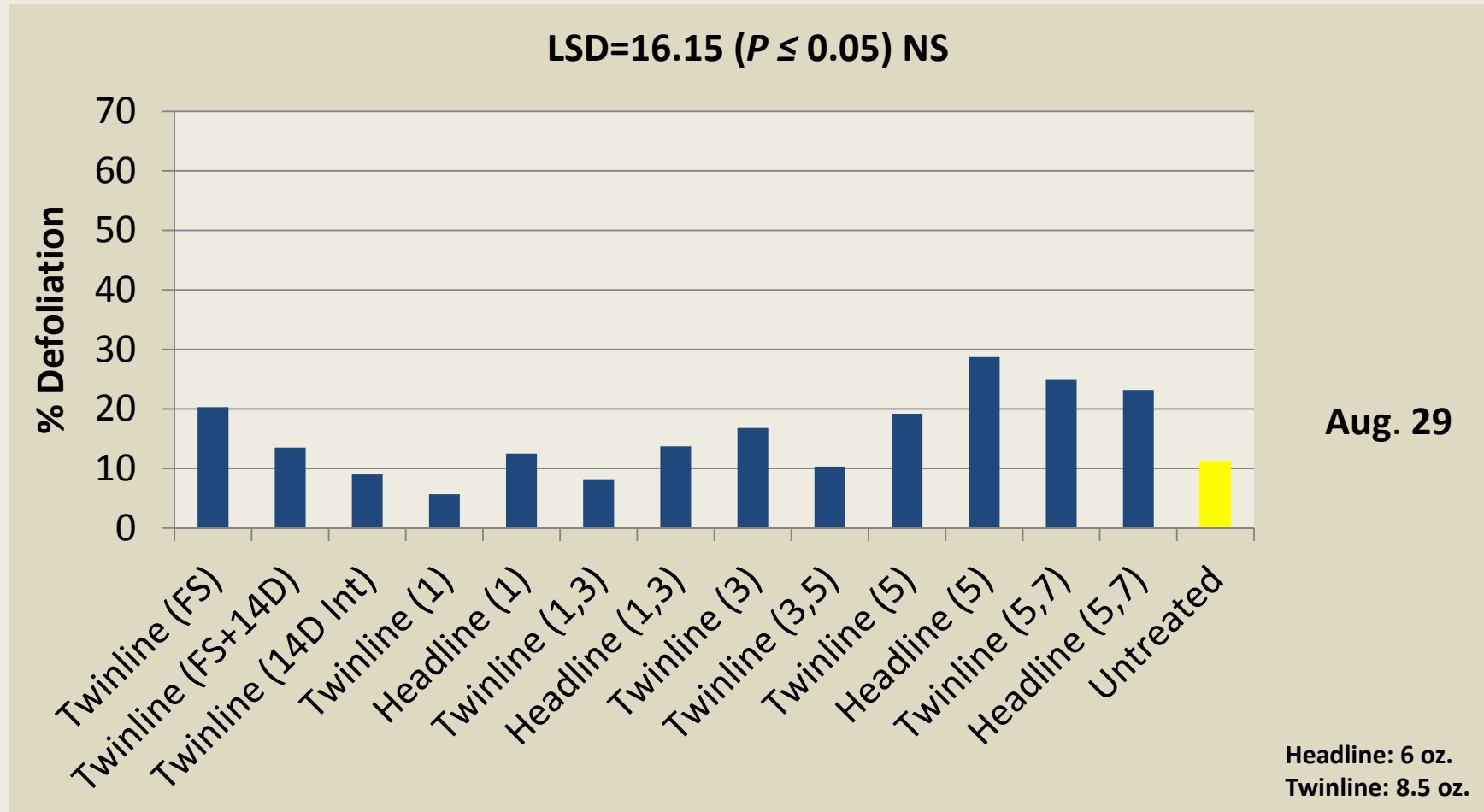
Target Spot



Planting date = May 3, First Bloom = July 10, Disease was first confirmed around June 20th

2012 Attapulgus REC, Decatur County

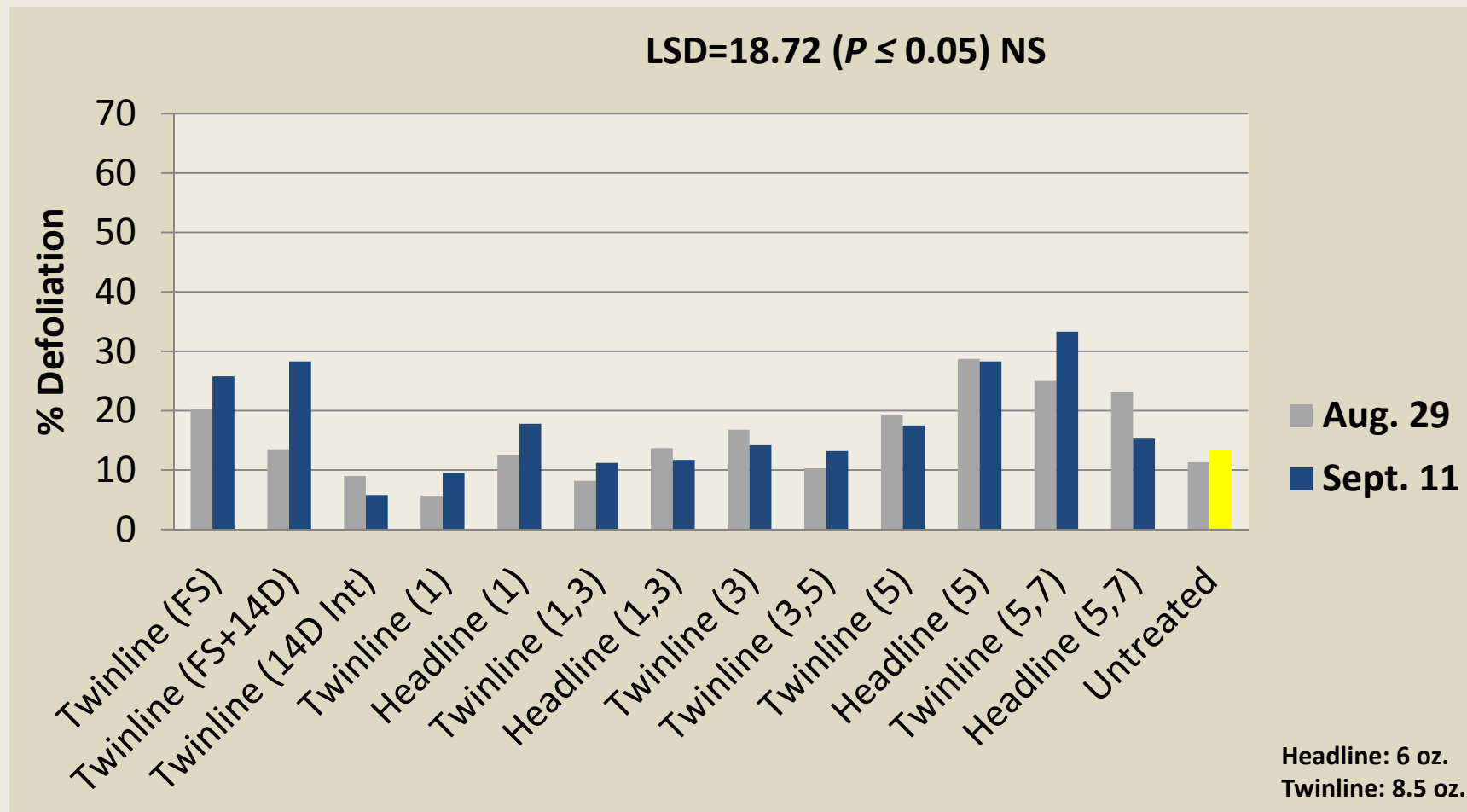
Target Spot / Stemphylium



Planting date = May 29, First Bloom = July 30, Disease was first confirmed around Aug 24th
Last spray before rating: August 16 (3rd Week of Bloom)

2012 Attapulgus REC, Decatur County

Target Spot / Stemphylium

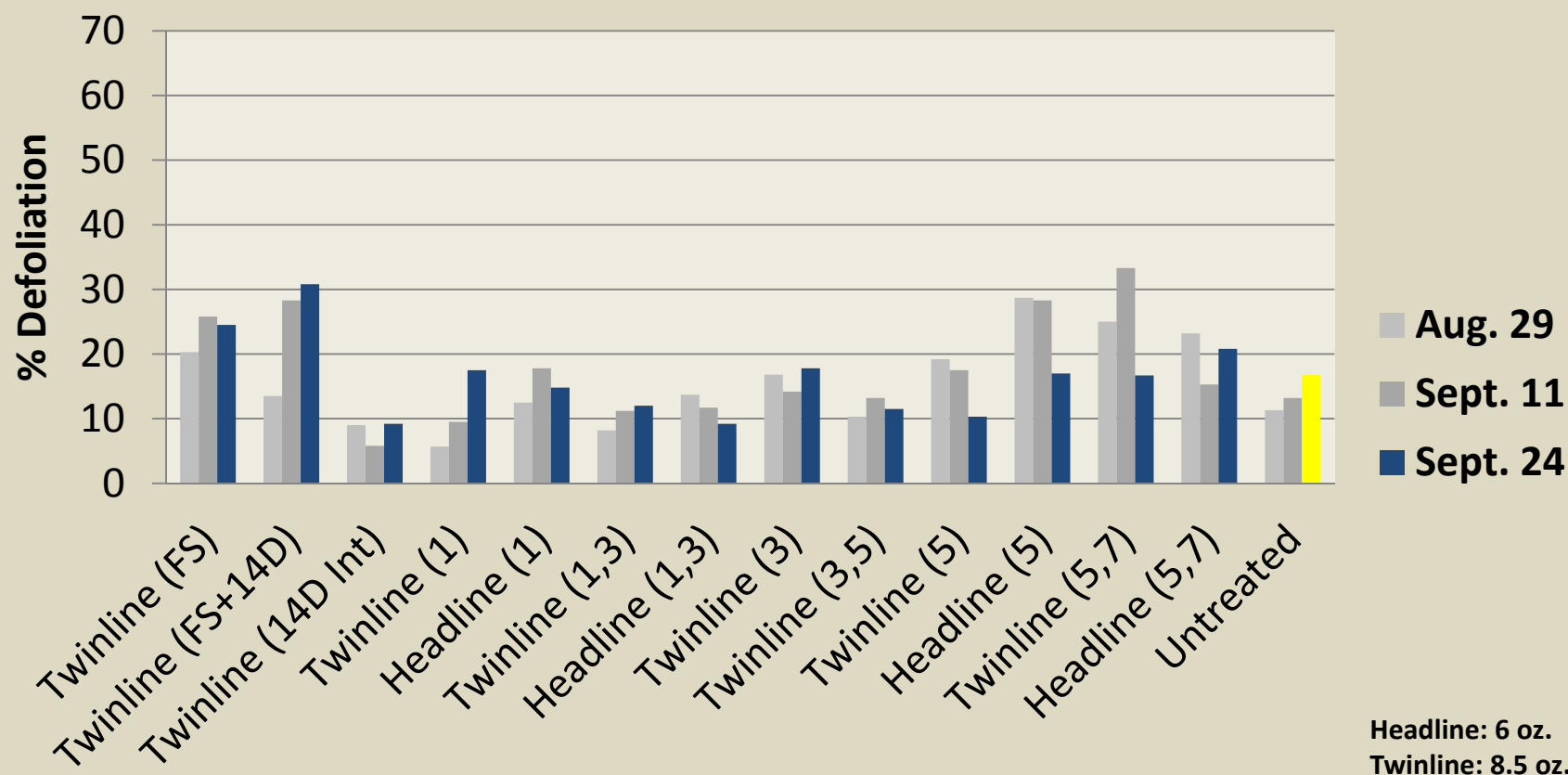


Planting date = May 29, First Bloom = July 30, Disease was first confirmed around Aug 24th
Last spray before rating: September 4 (5th Week of Bloom)

2012 Attapulgus REC, Decatur County

Target Spot / Stemphylium

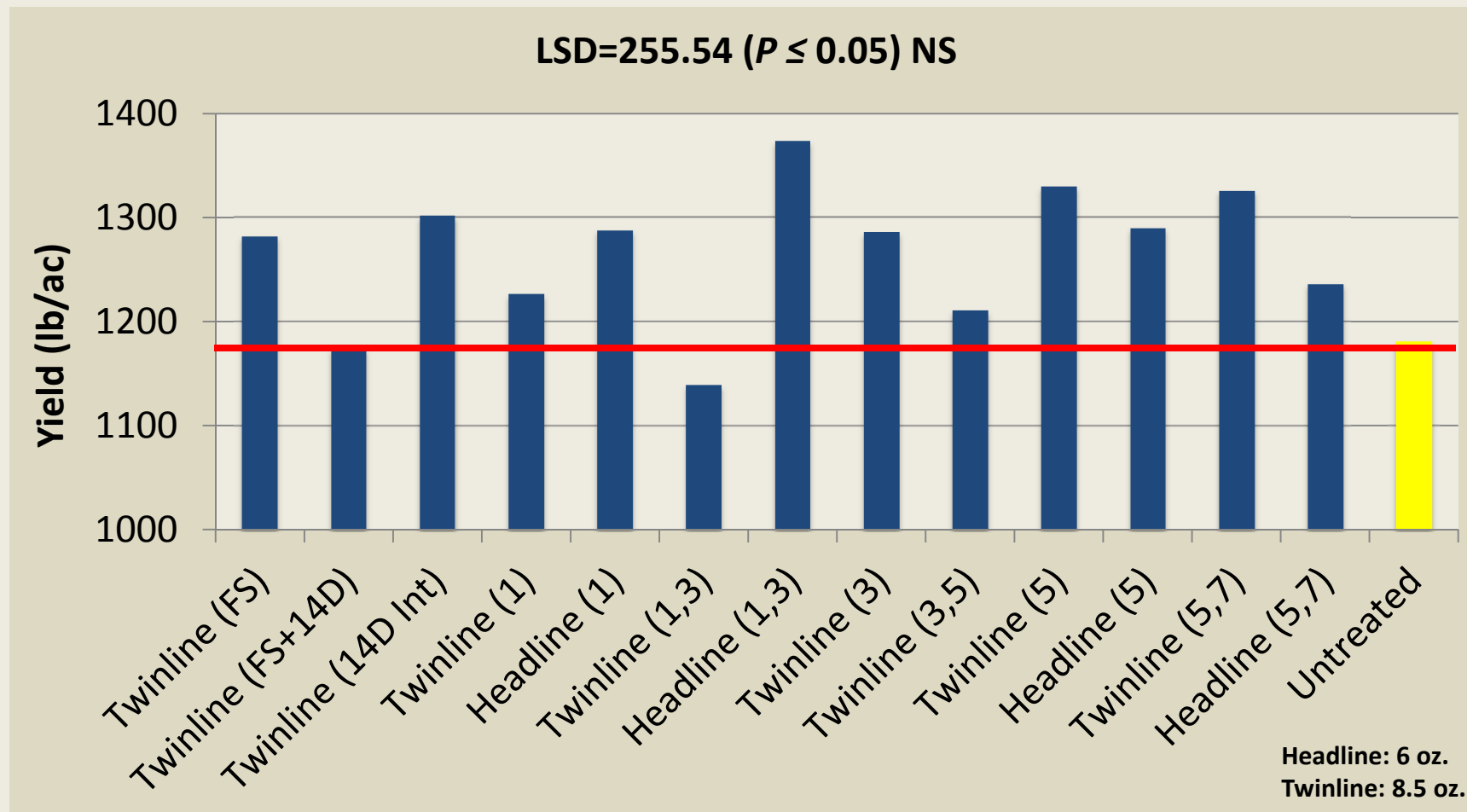
LSD=16.63 ($P \leq 0.05$) NS



Planting date = May 29, First Bloom = July 30, Disease was first confirmed around Aug 24th
Last spray before rating: September 13 (7th Week of Bloom)

2012 Attapulgus REC, Decatur County

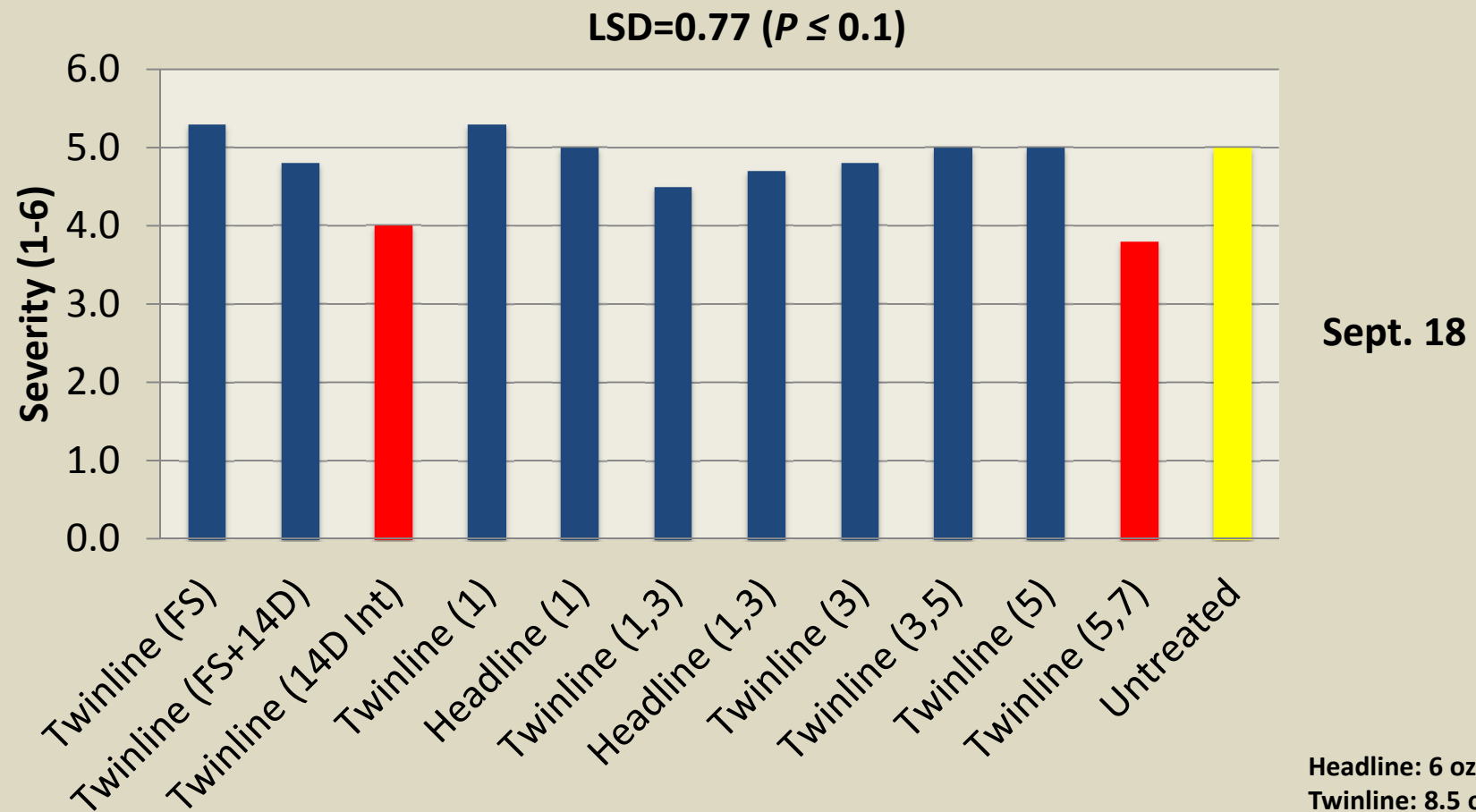
Target Spot / Stemphylium



Planting date = May 29, First Bloom = July 30, Disease was first confirmed around Aug 24th

2012 RDC Pivot, Tift County

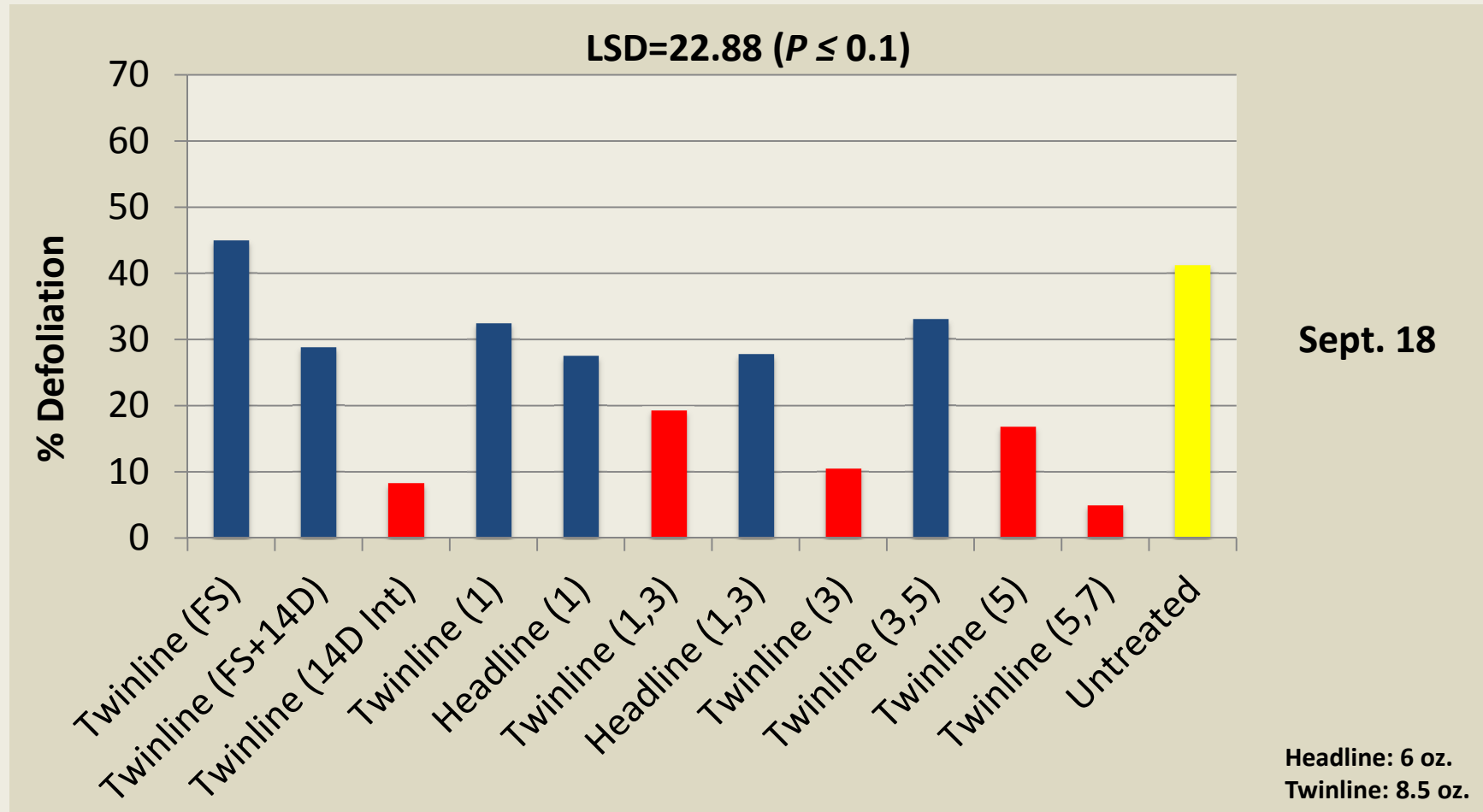
Target Spot / Stemphylium



Planting date = May 7, First Bloom = July 17, Disease was first confirmed around Sept. 5th
Last spray before rating: August 31 (7th Week of Bloom)

2012 RDC Pivot, Tift County

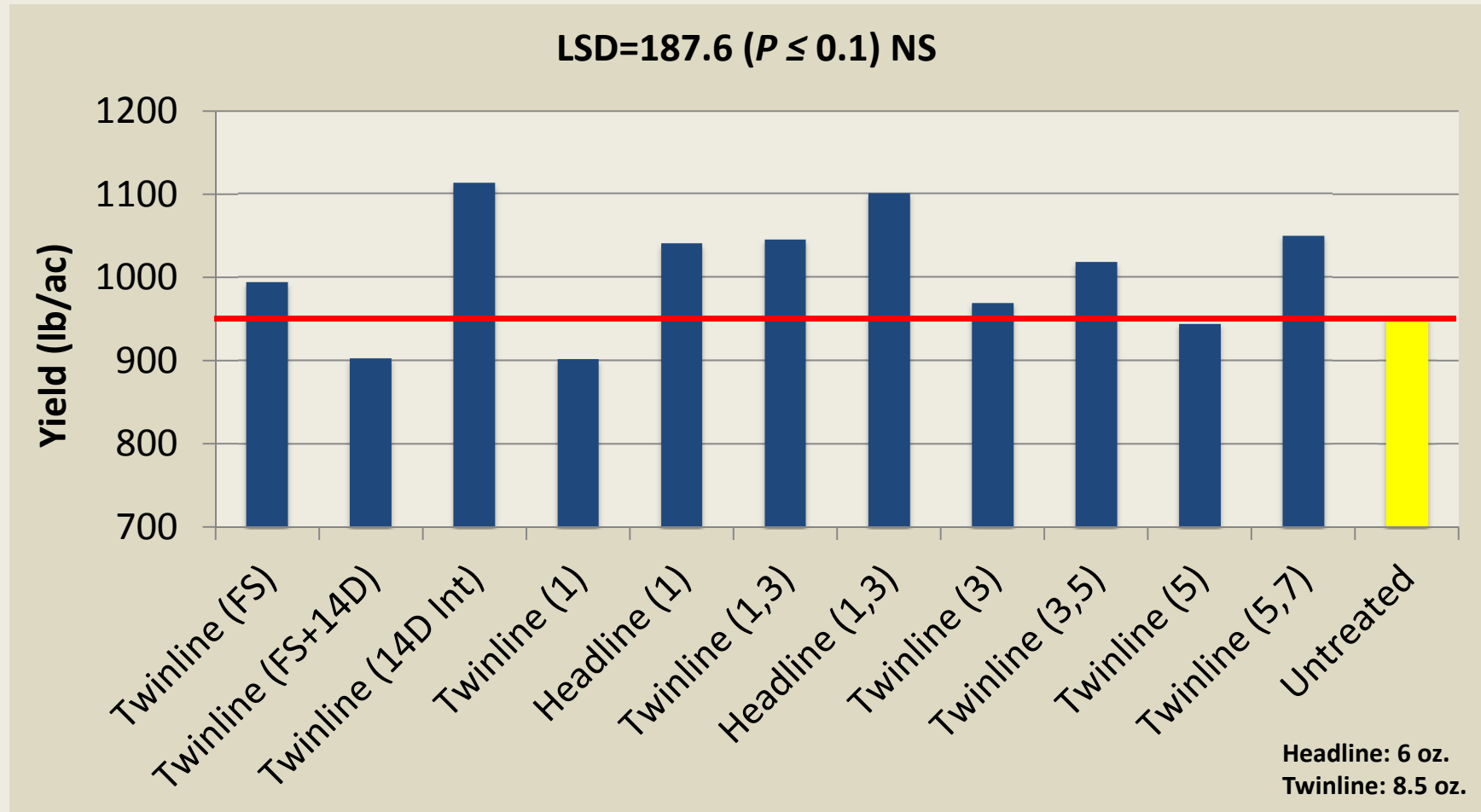
Target Spot / Stemphylium



Planting date = May 7, First Bloom = July 17, Disease was first confirmed around Sept. 5th
Last spray before rating: August 31 (7th Week of Bloom)

2012 RDC Pivot, Tift County

Target Spot / Stemphylium



Planting date = May 7, First Bloom = July 17, Disease was first confirmed around Sept. 5th

Georgia Small Plot Trial Recap

Stripling

- 3rd week of bloom timing best reduced defoliation
- Late application protected new growth, but did not help yields

Attapulugus

- Stemphylium and Target Spot
- Not much defoliation
- 11 of 13 treatments had numeric yield increase

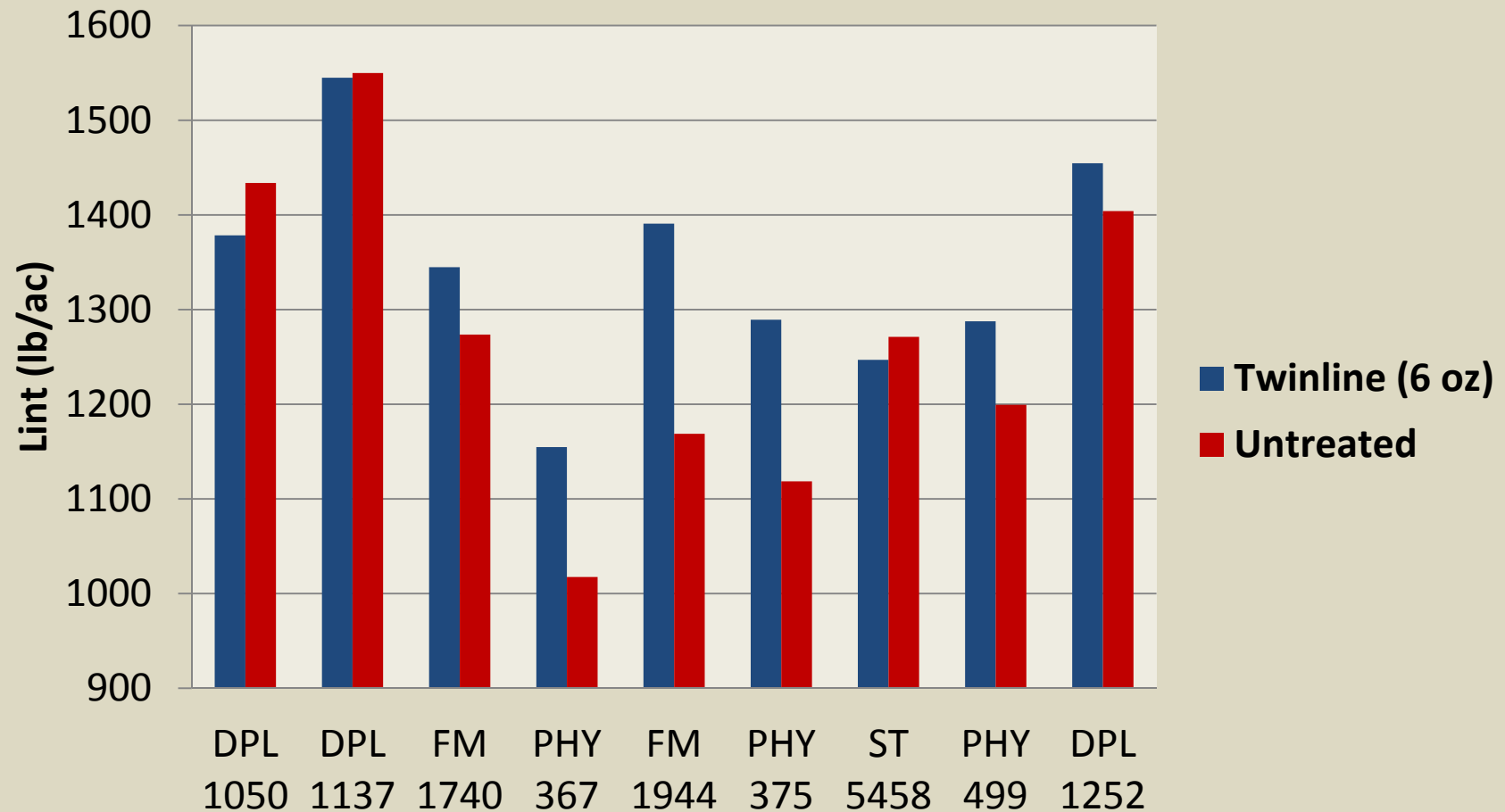
Tifton

- Late timings had best disease control
- 8 of 11 treatment had numeric yield increases

❖ 200 LB.

2012 Cotton Defoliation Study, Mitchell County

Target Spot

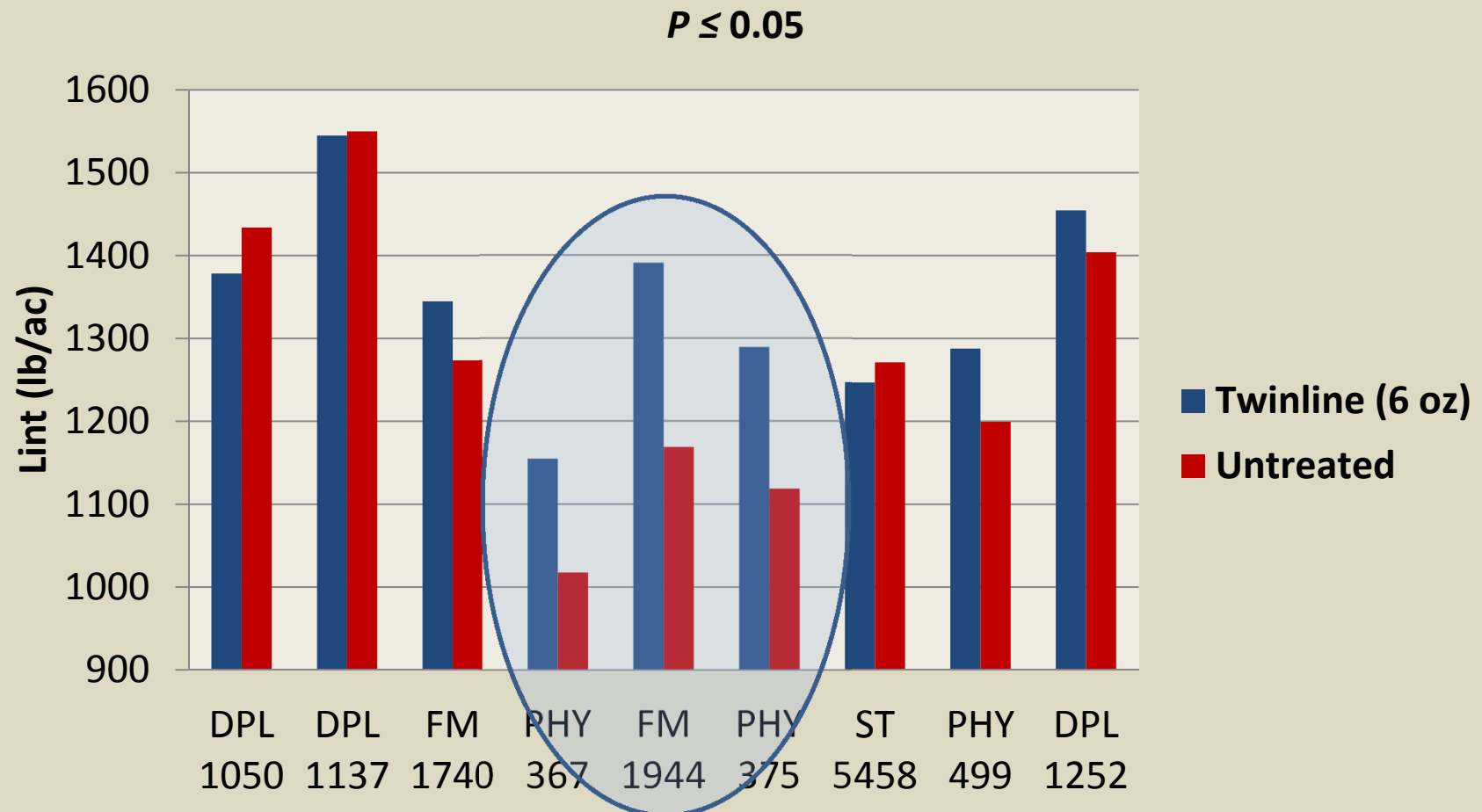


Source: RJ Byrne

Sprayed rows were treated with a single application of Headline during the 6th week of bloom

2012 Cotton Defoliation Study, Mitchell County

Target Spot

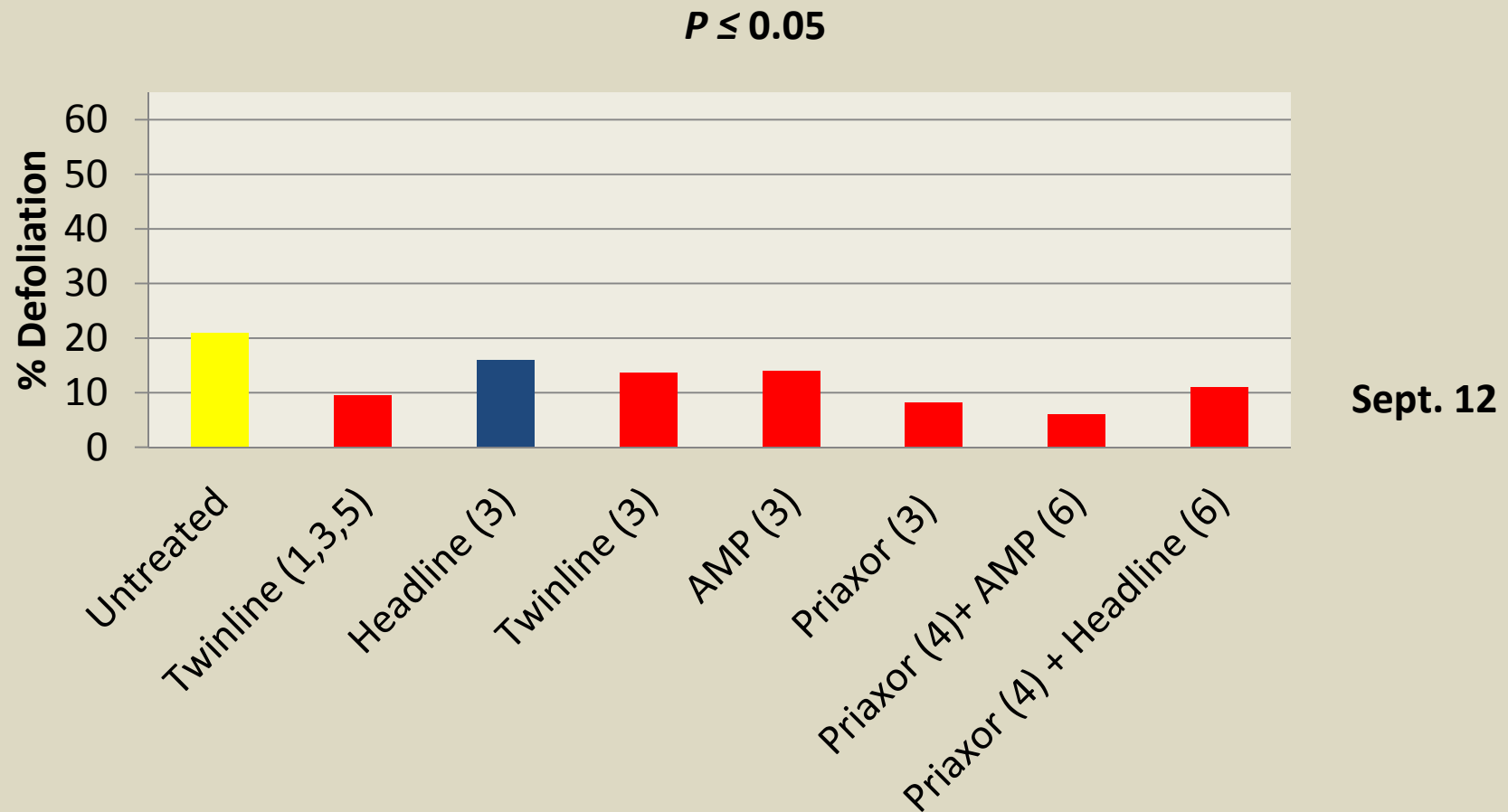


Disease was established in the field prior to application

Source: RJ Byrne

2012 Tidewater AREC, Suffolk VA

Target Spot



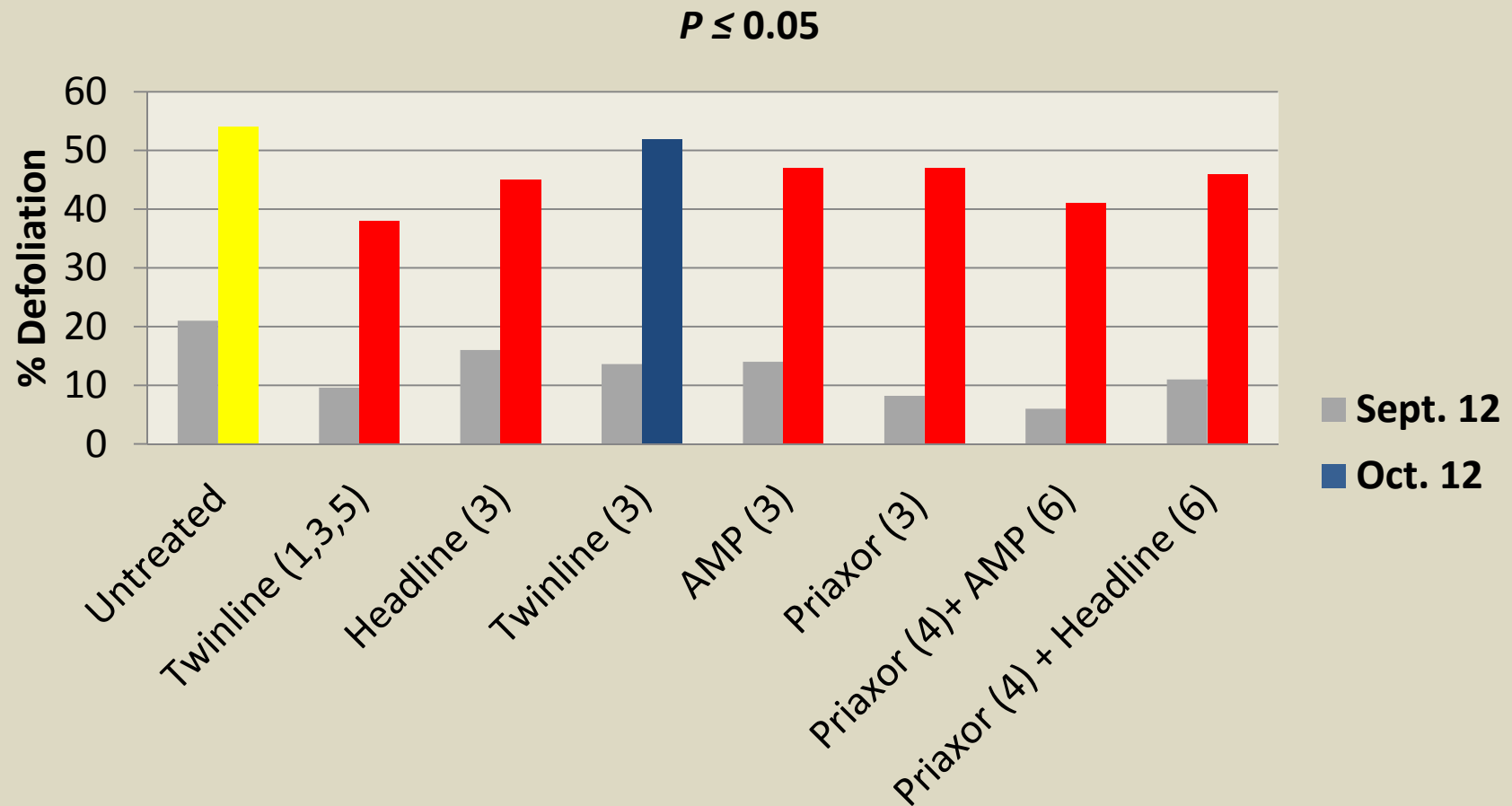
Planting date = May 17, First bloom = July 23, Disease was first confirmed on August 27

Last spray before rating: August 28 (6th Week of Bloom)

Source: Pat Phipps, Virginia Tech

2012 Tidewater AREC, Suffolk VA

Target Spot



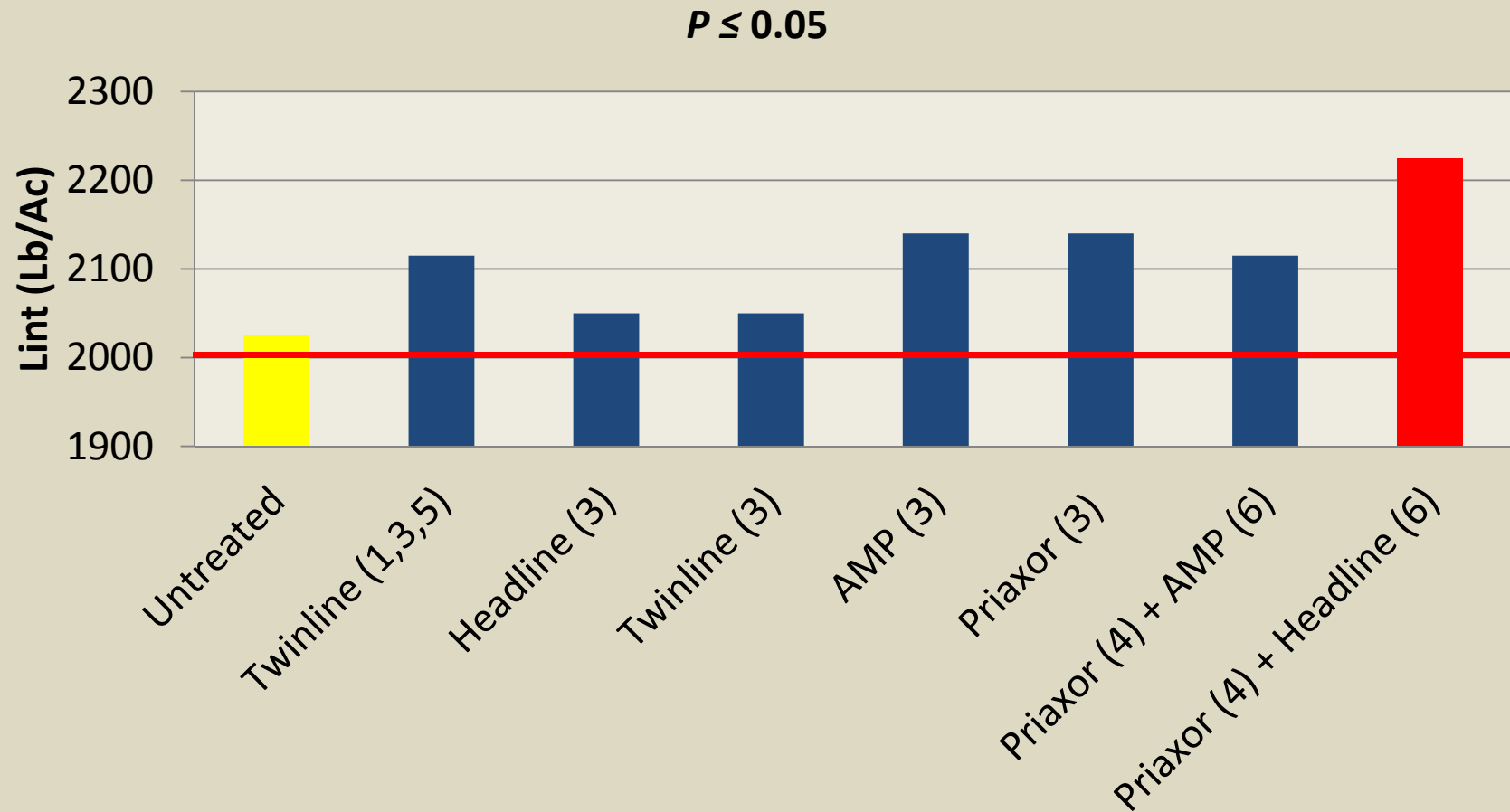
Planting date = May 17, First bloom = July 23, Disease was first confirmed on August 27

Last spray before rating: August 28 (6th Week of Bloom)

Source: Pat Phipps, Virginia Tech

2012 Tidewater AREC, Suffolk VA

Target Spot



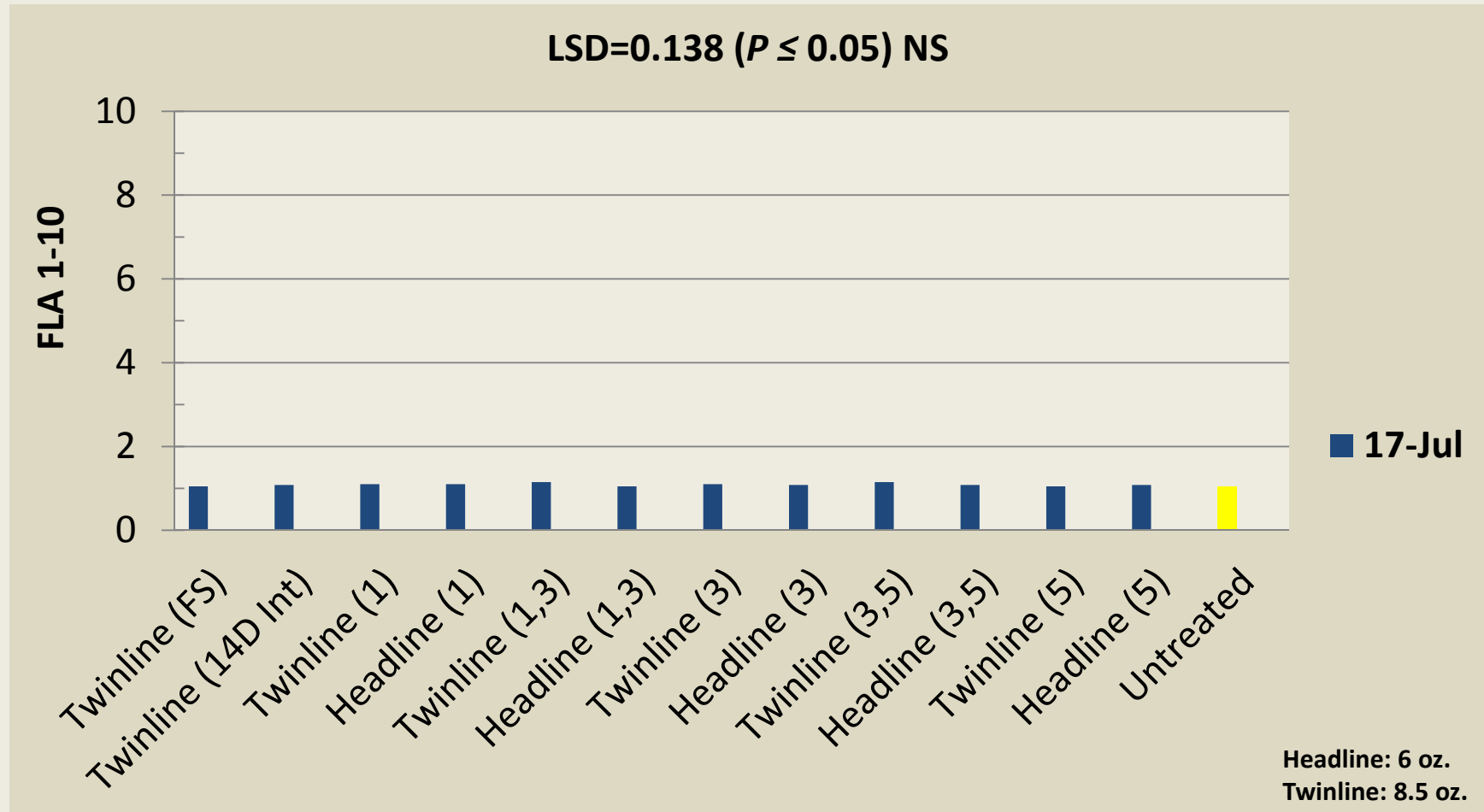
Source: Pat Phipps, Virginia Tech

Florida 1-10 Scale

1. No disease
2. Few spotted leaves in canopy
3. Few spotted leaves in upper canopy
4. Leaf spotting and $\leq 5\%$ defoliation
5. Leaf spotting and $\leq 25\%$ defoliation
6. Spotted leaves numerous and $\leq 50\%$ defoliation
7. Spotted leaves numerous and $\leq 75\%$ defoliation
8. Numerous leaf spots and $\leq 90\%$ defoliation
9. Few remaining leaves and $\leq 95\%$ defoliation
10. Plants defoliated or dead

2013 Stripling Irrigation Park, Mitchell County

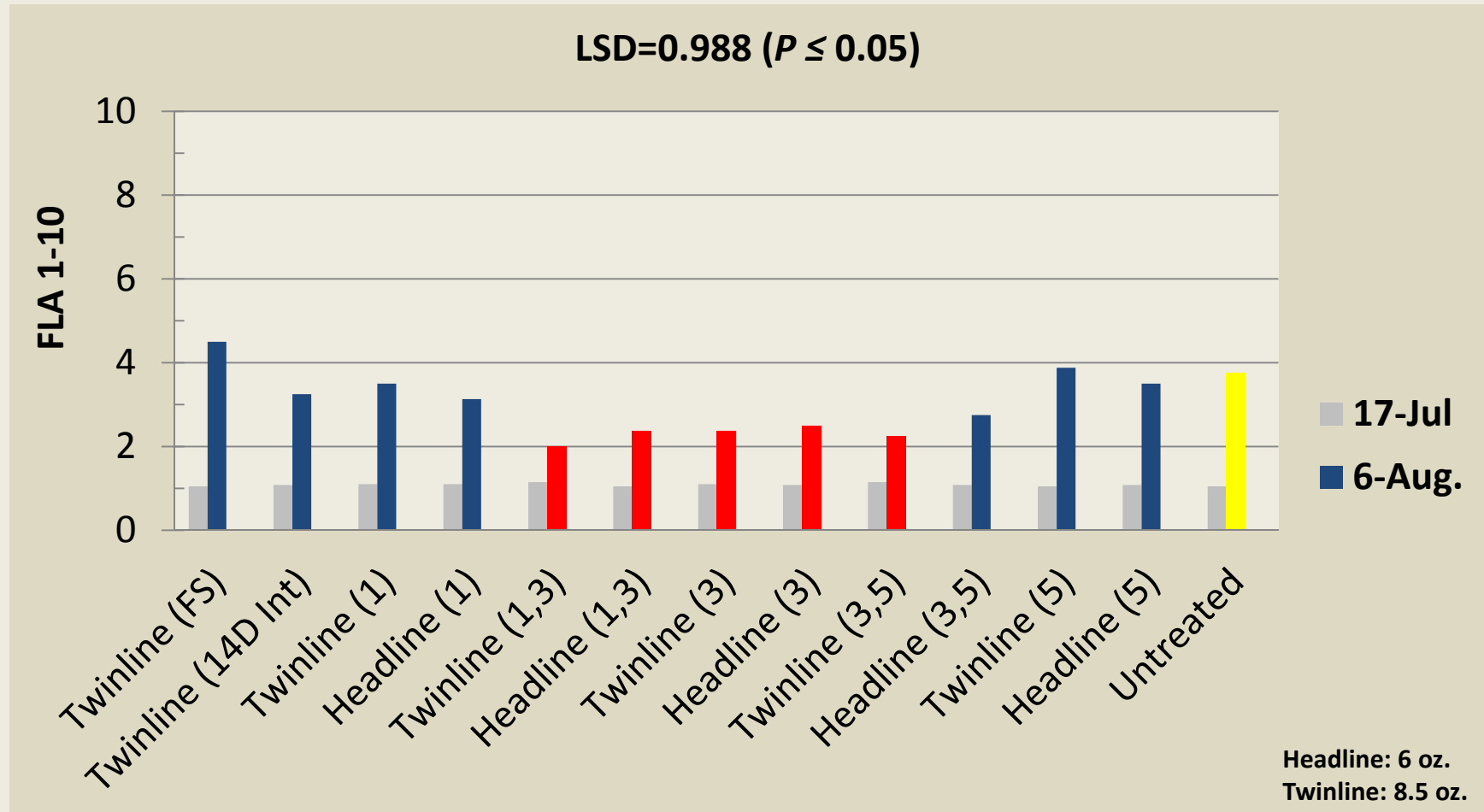
Target Spot



Planting Date = May 8, First Bloom = July 9, Disease was confirmed on July 9
Last spray before rating = July 9th (1st Week of Bloom)

2013 Stripling Irrigation Park, Mitchell County

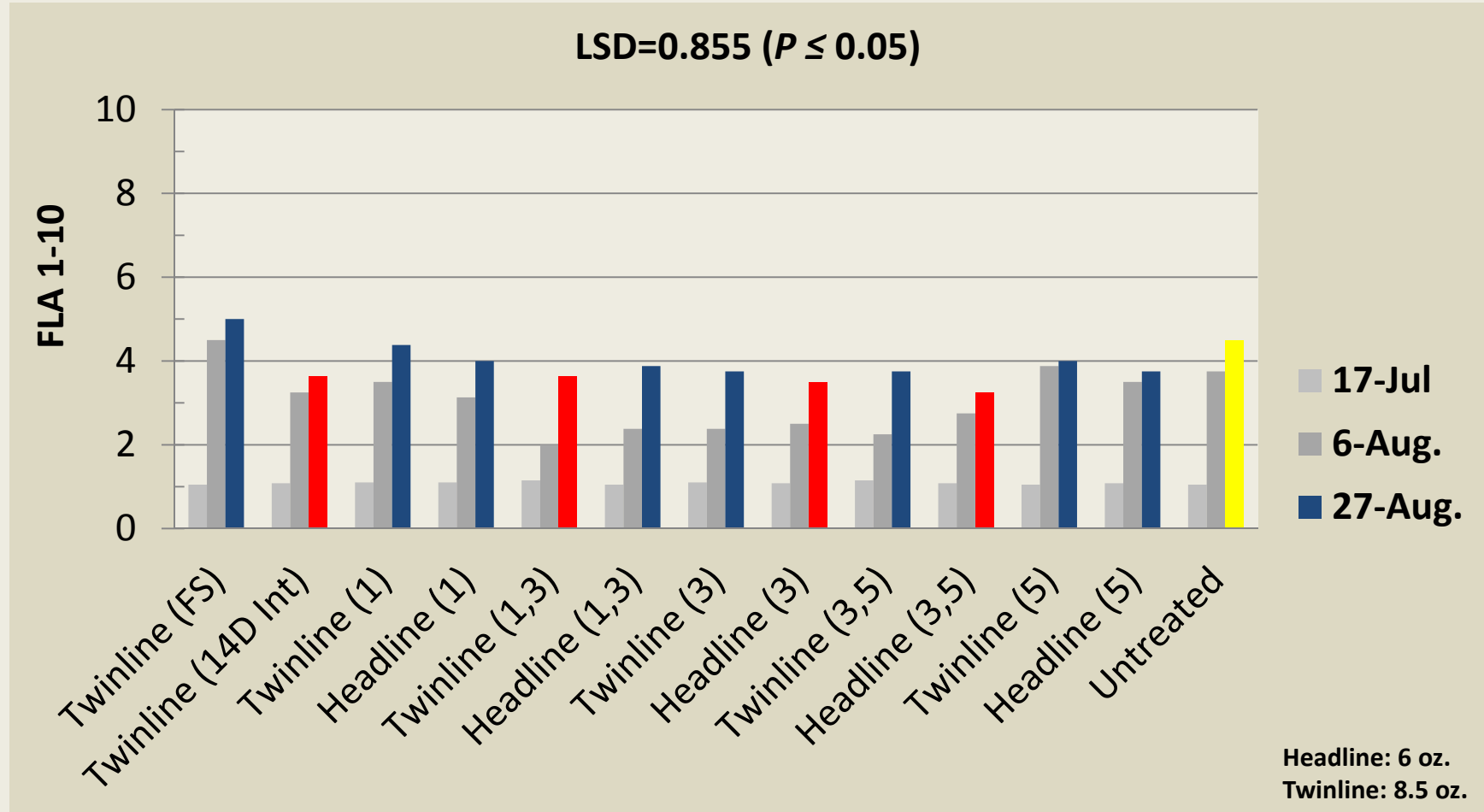
Target Spot



Planting Date = May 8, First Bloom = July 9, Disease was confirmed on July 9
Last spray before rating = July 25th (3rd Week of Bloom)

2013 Stripling Irrigation Park, Mitchell County

Target Spot



Planting Date = May 8, First Bloom = July 9, Disease was confirmed on July 9
Last spray before rating = August 20th (7th Week of Bloom)

Summary

- Optimal fungicide timing appeared to be first week of bloom and third week of bloom
- Strong trends for numeric yield increases across fungicide treatments versus untreated check
- Plots treated with Headline tended to out-yield plots treated with Twinline
- Evidence shows that Target Spot can be controlled with use of fungicides with potential of protected yield
- Combined results suggest that 200 lb. increase in lint is a realistic goal with use of fungicides
- Growers with high risk fields can expect similar results when using fungicides at proper timing
 - UGA Extension will recommend judicious use of fungicides in cotton in 2013

Acknowledgements

- BASF
- Attapulgu REC Staff
- Stripling Irrigation Park Staff
- Abraham Fulmer
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- Caleb Clements

