

Yield Loss of Corn to Incremental Defoliation

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Project Purpose

- Predicting yield loss in field corn to defoliators such as plant pathogens and insects that progressively increase in severity over time.
- Additionally, environmental impacts, such as hail, frost, leaf-shredding/soil-blowing rains can be determined by the defoliation method.

Incremental Leaf Removal (Clipping Codes)

R1 = Silking

R2 = blister

R3 = milk

R5 = Dent

LL = leaves below the ear leaf

UL = 2 leaves above the last defoliation

Example: LL, UL @ R2, R3, R5 = @ R2 Removal of all leaves below the ear Leaf (LL) + ear leaf and the leaf above ear leaf (UL). @ R3 Removal of the next two leaves. @ R5 Removal of the next two leaves.

Table 1. Yield responses due to incremental removal of corn leaves from silking (R1) through dent (R5) of Hybrids AM1884 and Pio28HR20, Ben Hur Research Farm, Baton Rouge, 2017.

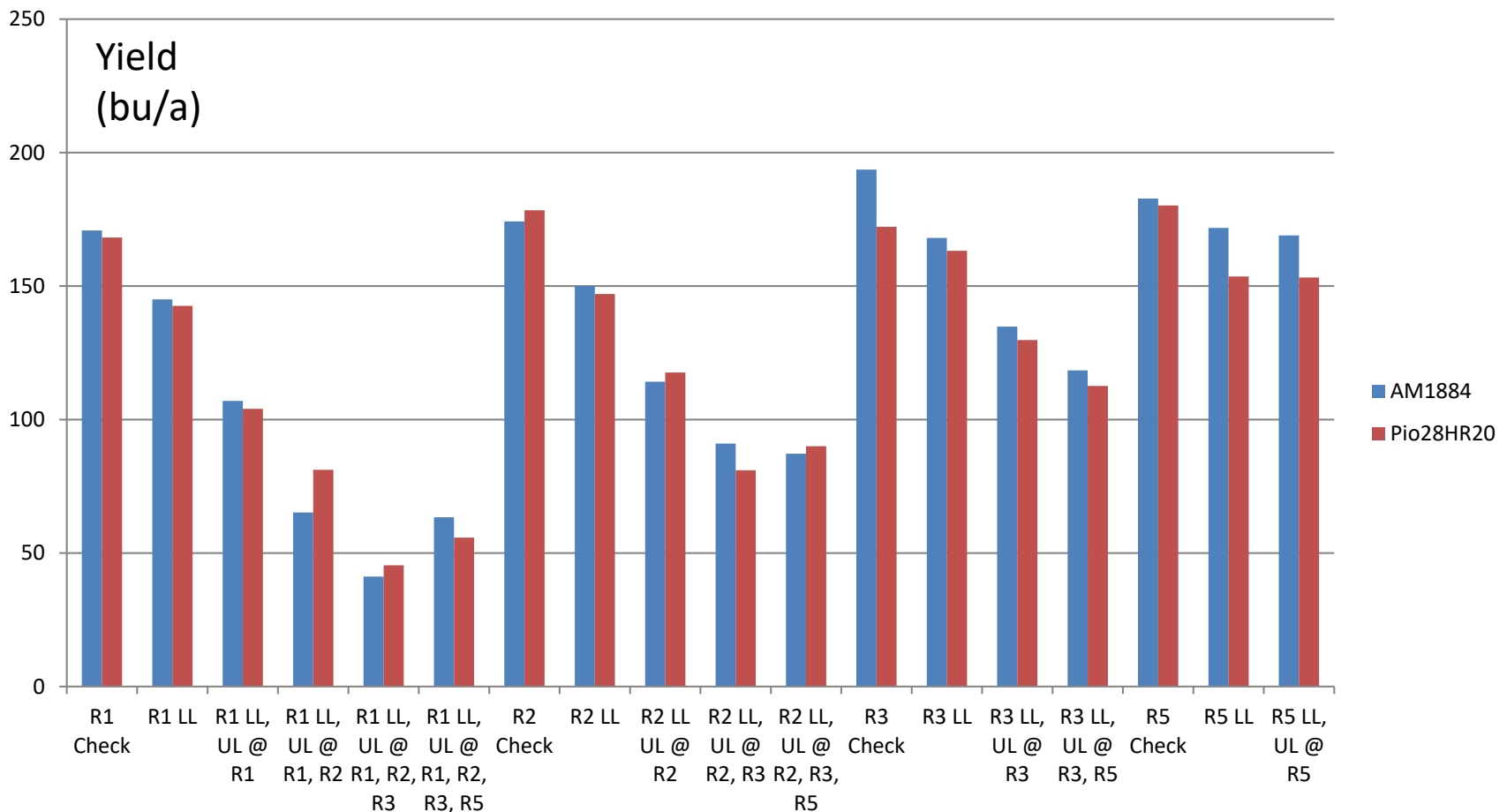


Table 2. Yield responses due to incremental removal of corn leaves from silking (R1) through dent (R5) of Hybrids AM1884 and Pio28HR20, Dean Lee Research Farm, Alexandria, 2017.

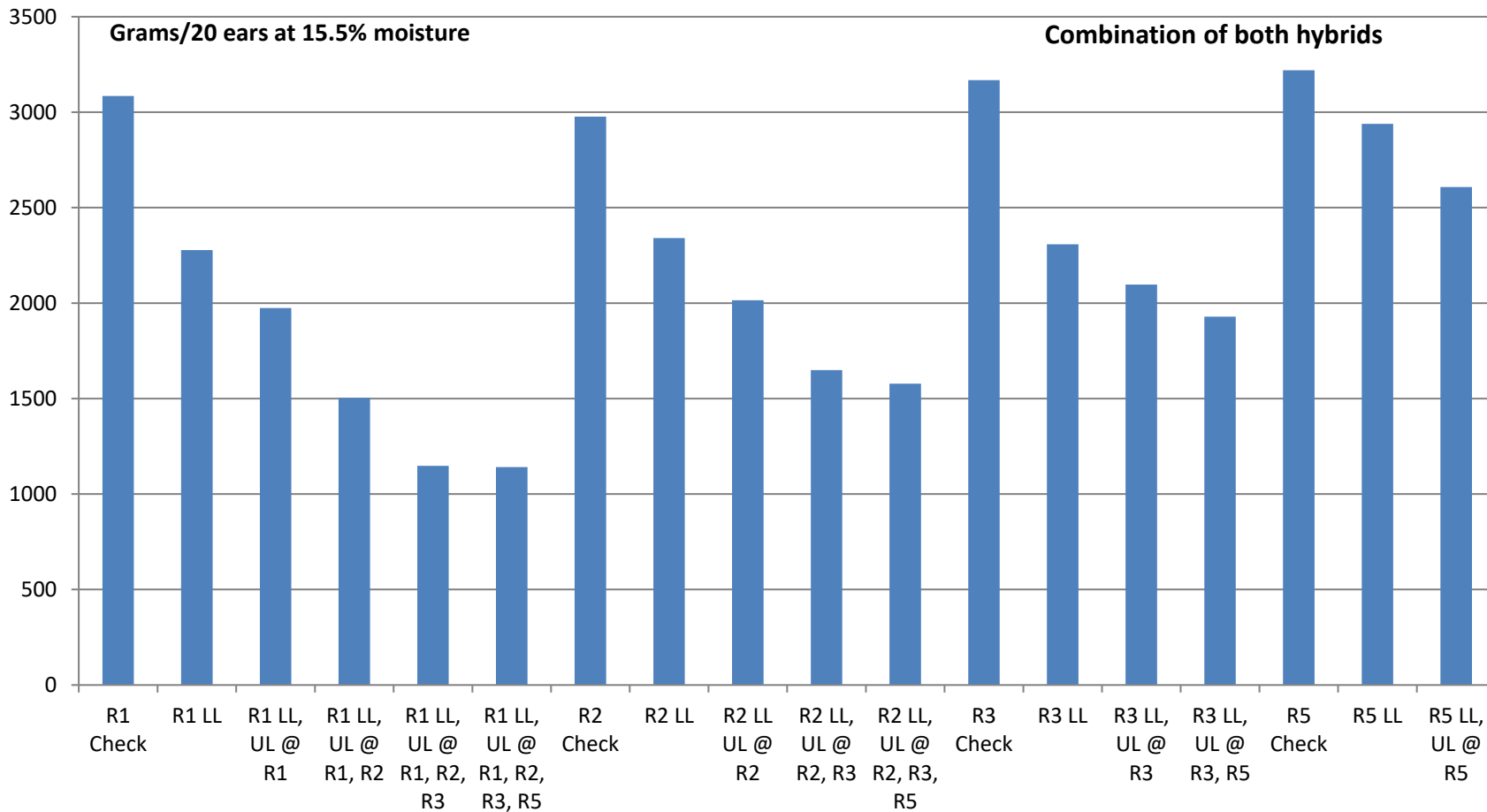


Table 3. Yield responses due to incremental removal of corn leaves from silking (R1) through dent (R5) of Hybrids AM1884 and Pio28HR20, Scott Center, Winnsboro, 2017.

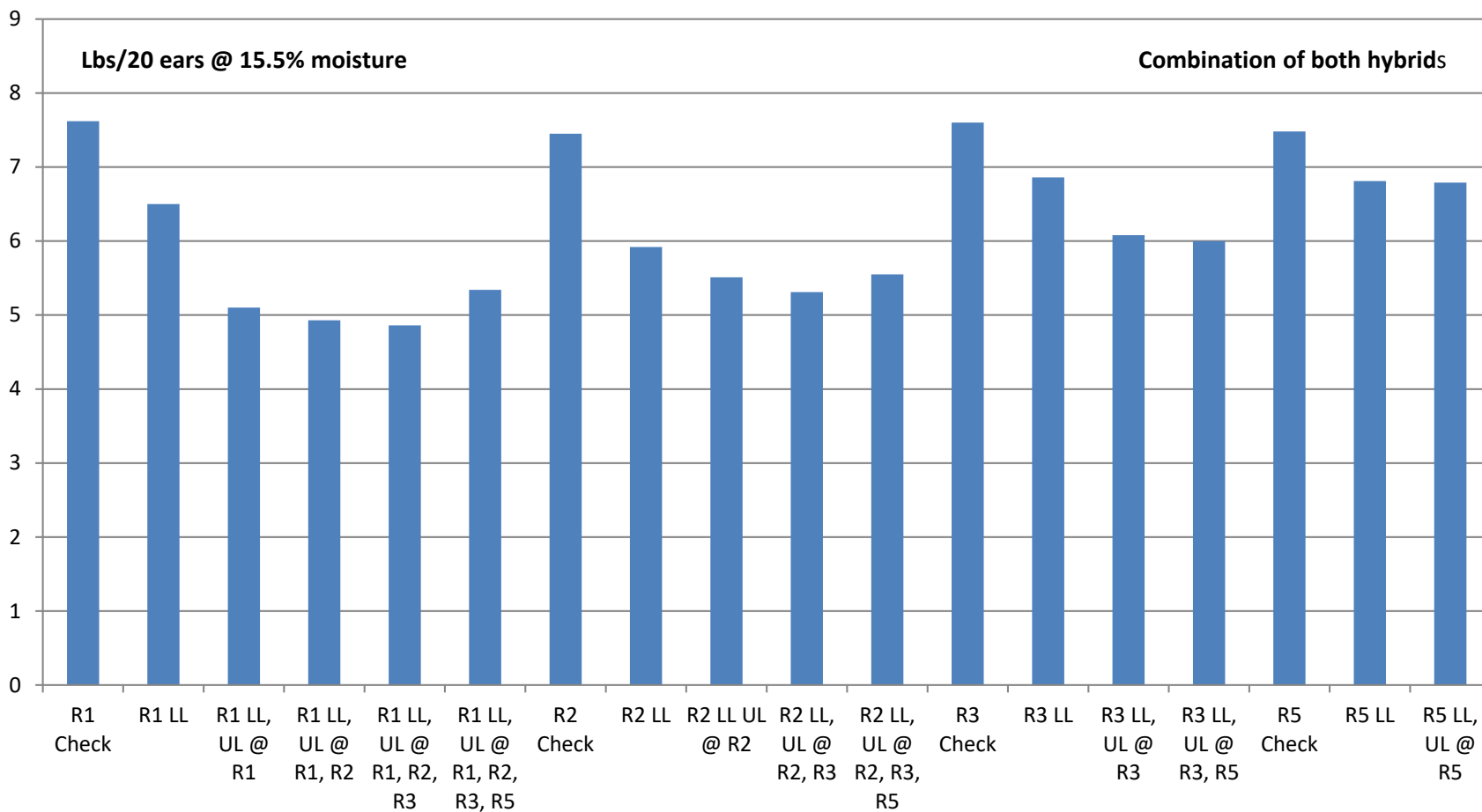
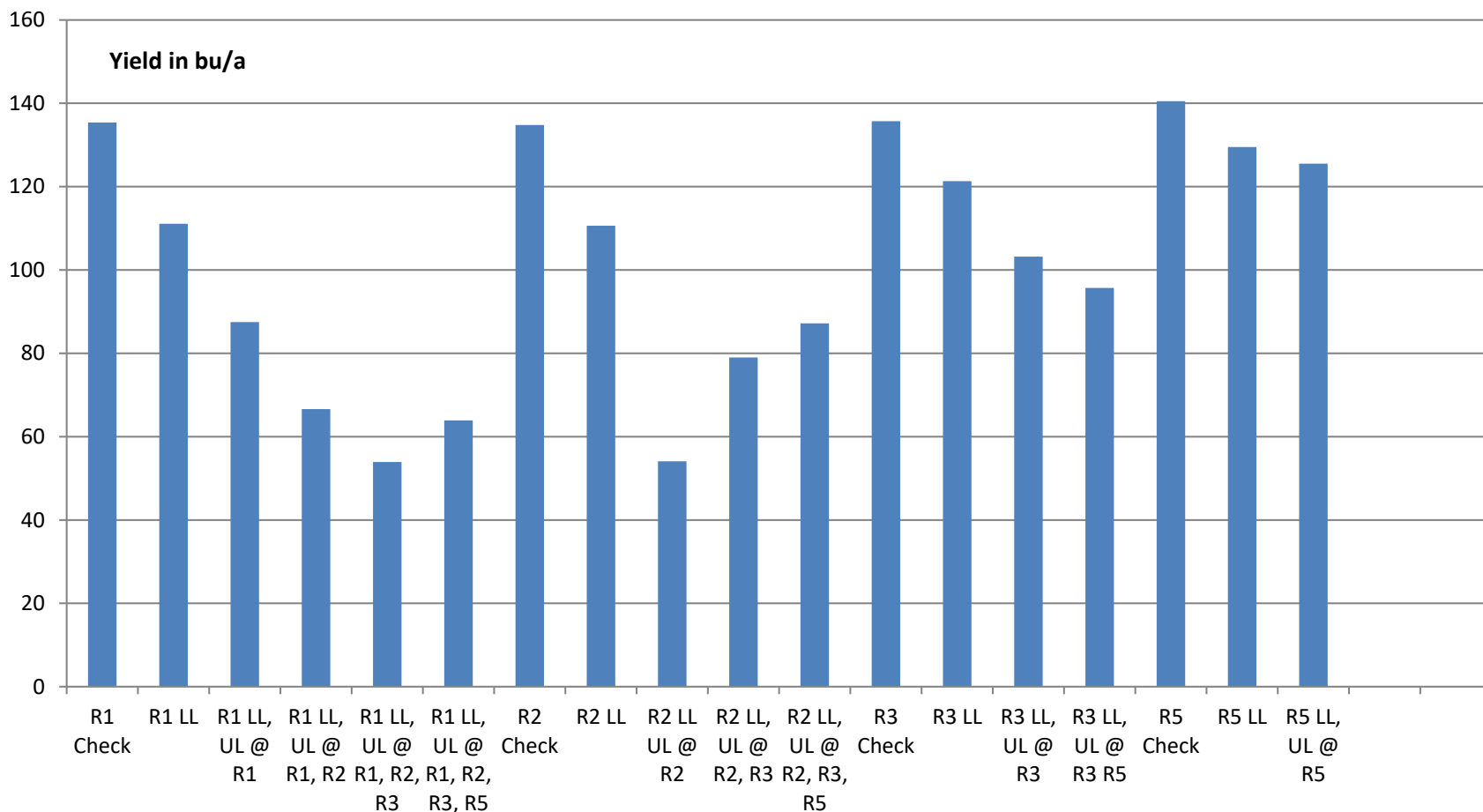


Table 4. Yield responses due to incremental removal of corn leaves from silking (R1) through dent (R5) of Hybrids AM1884 and Pio28HR20, from Baton Rouge, Alexandria and Winnsboro, 2017.



Yield Losses Associated with Incremental Defoliation

Treatment	Yield	Defoliation %	Loss %
R1 Check	135.4	0	0
R1 LL	111.1	50	17.9
R1 LL, UL @ R1	87.5	57	35.4
R1 LL, UL @ R1, R2	66.6	64	50.8
R1 LL, UL @ R1, R2, R3	53.9	71	60.3
R1 LL, UL @ R1, R2, R3, R5	63.9	79	52.8
R2 Check	134.8	0	0
R2 LL	110.6	50	18
R2 LL UL @ R2	54.1	57	59.9
R2 LL, UL @ R2, R3	79	64	41.4
R2 LL, UL @ R2, R3, R5	87.2	71	35.3
R3 Check	135.7	0	0
R3 LL	121.3	50	10.6
R3 LL, UL @ R3	103.2	57	23.9
R3 LL, UL @ R3 R5	95.7	64	29.5
R5 Check	140.5	0	0
R5 LL	129.5	50	7.8
R5 LL, UL @ R5	125.5	57	10.7

Review

- Regardless of hybrid used the same pattern of yield loss was observed.
- The earlier the damage to the leaf, the greater impact on yield.
- One time removal even in early growth stages, impacts yield.
- Unchecked, continual disease or damage to leaves reduces yield severely.

Southern Corn Rust



Southern Corn Rust



Risk factors to determine management action for Southern corn rust.

Temperature (point value)	50-76 degrees (0)	77-90 degrees (3)	91-104 degrees (1)	Sub-total points
enter point value →				
Leaf Wetness (dew period hours) (point value)	0-3 hours (0)	4-8 hours (2)	9-16 hours (3)	
enter point value →				
Storm Intensity (point value)	Light rain/no wind (2)	Light rain/ light wind (3)	Intermediate rain/wind (1)	Heavy rain/wind (0)
enter point value →				
Total				

Recommendation: Begin scouting for Southern corn rust at tasseling stage

Suggestion: If total points are less than 7, do not apply fungicide because some conditions for Southern corn rust development are missing.

Suggestion: If total points are 7-9, then applying Southern corn rust fungicide is recommended, especially if rust is present and the corn growth stage is R2-R5.

Note: No decision aid/risk evaluation tool is perfect, and some decisions are still subjective.

Thank you!

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- I thank my lab and field crew (Patricia Bollich, Lacy Brooks and Stephen Harding) for their hard work (clipping, harvesting and weighing)!
- I thank the LACA Program Committee for asking me to present!
- Questions?