

Bacterial Blight of Cotton During 2011 & 2012: Field Trash or Seed

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Angular leaf spot/bacterial blight

- Caused by a bacterium (*Xanthomonas axonopodis* pv. *malvacearum*):
 - Leads to:
 - Seedling blight
 - Leaf spot
 - Vascular infection leads to blackened veins
 - Blackarm on stems and petioles
 - Boll blight (open wound for secondary organisms)
 - Boll rot (either the bacterium **OR** secondary)
- Foliar phase is commonly referred to as “angular leaf spot”
 - **BUT** not all angular spots are bacterial blight
 - Angular nature of the symptoms results from capillary veins limiting the movement of the organism

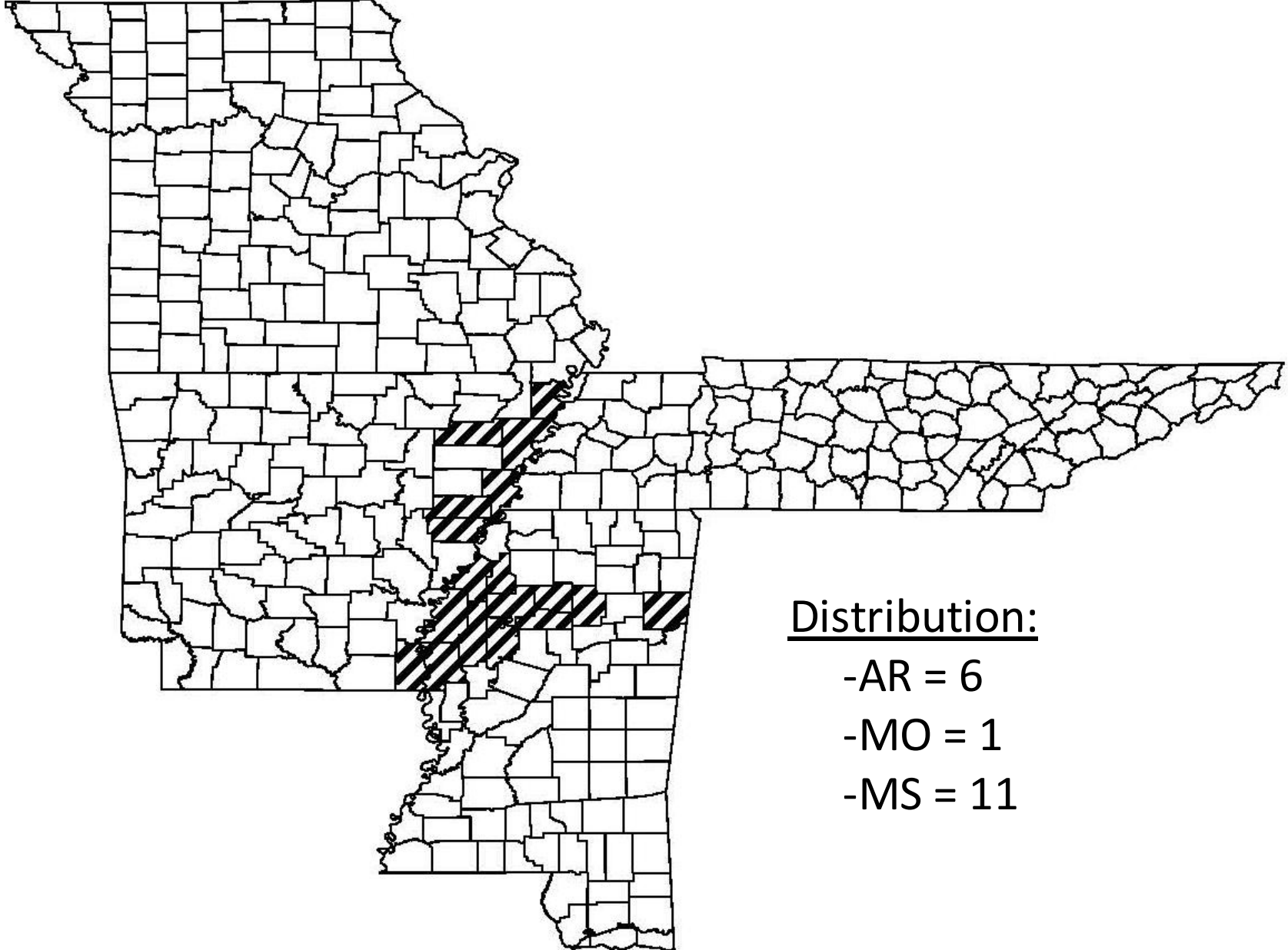




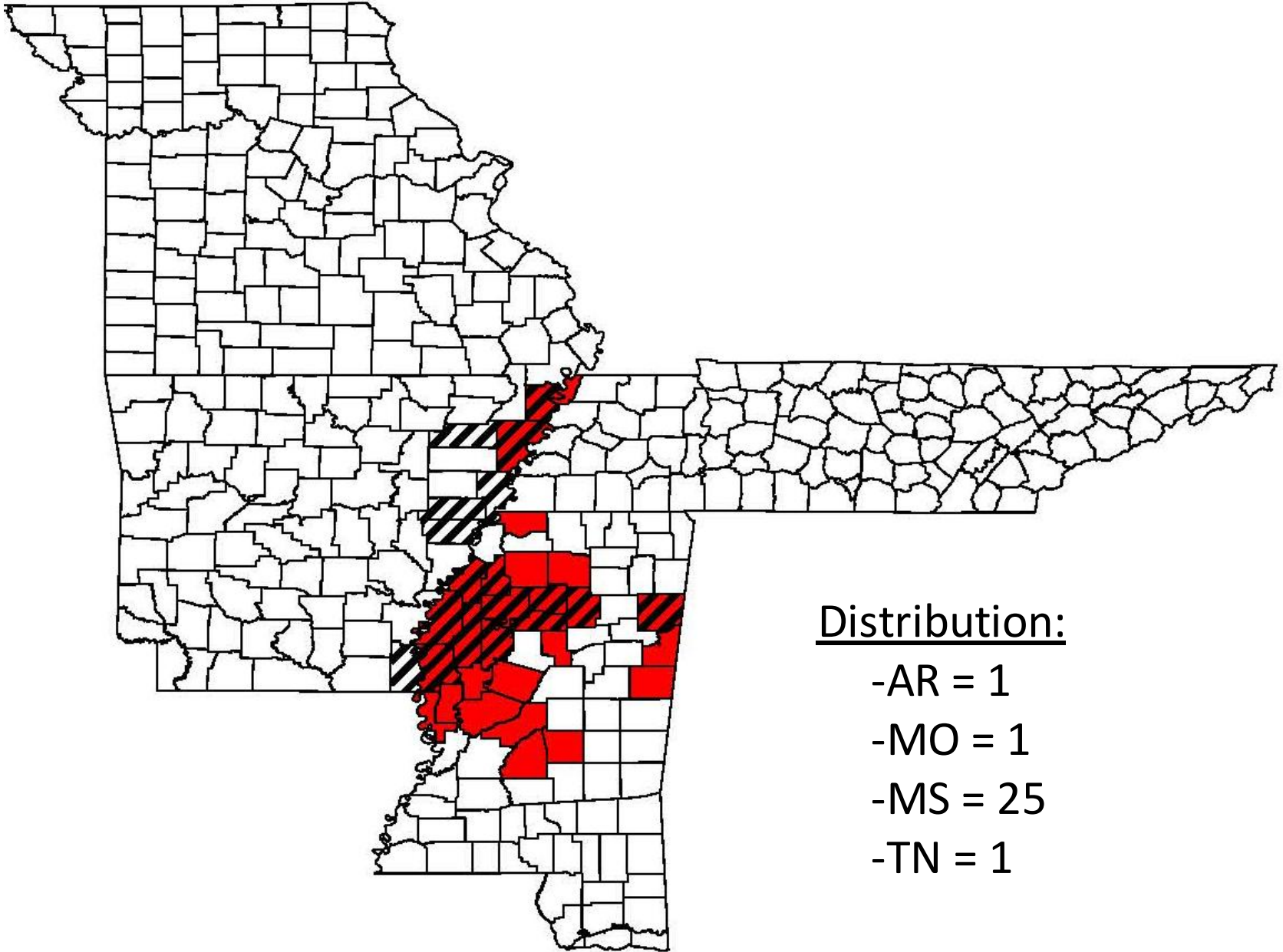




2011 disease distribution



2011 & 2012 disease distribution



2011 Arkansas Seed Testing

- Reported in: Rothrock et al., The Resurgence of Bacterial Blight on Cotton in Arkansas, 2012 Beltwide Cotton Conferences
- 2011 Arkansas infected varieties:
 - DP 0912, AM 1550, PHY 367, ST 5458
- 34 seed lots were screened from the above varieties
 - 14 of 34 seed lots contained *Xam* as an internal contaminant
 - 3 of 34 seed lots contained *Xam* as an external contaminant post-acid delinting

Bacterial blight facts

- Predominantly a seedborne organism
 - Reason for acid delinting
- ≈19-20 races of the bacterium worldwide
 - Virulence/pathogenicity differs between races
 - Mostly geographic in origin, the races in the U.S. are 1, 2, 5, 6, 7, 8, 11, 12, and 18 (18 is most common)
- Prefers high temperature (86-97°F) with high humidity (> 85%)
- Survival in soil depends on prevailing environment between seasons and tillage
- Yield loss (??%)

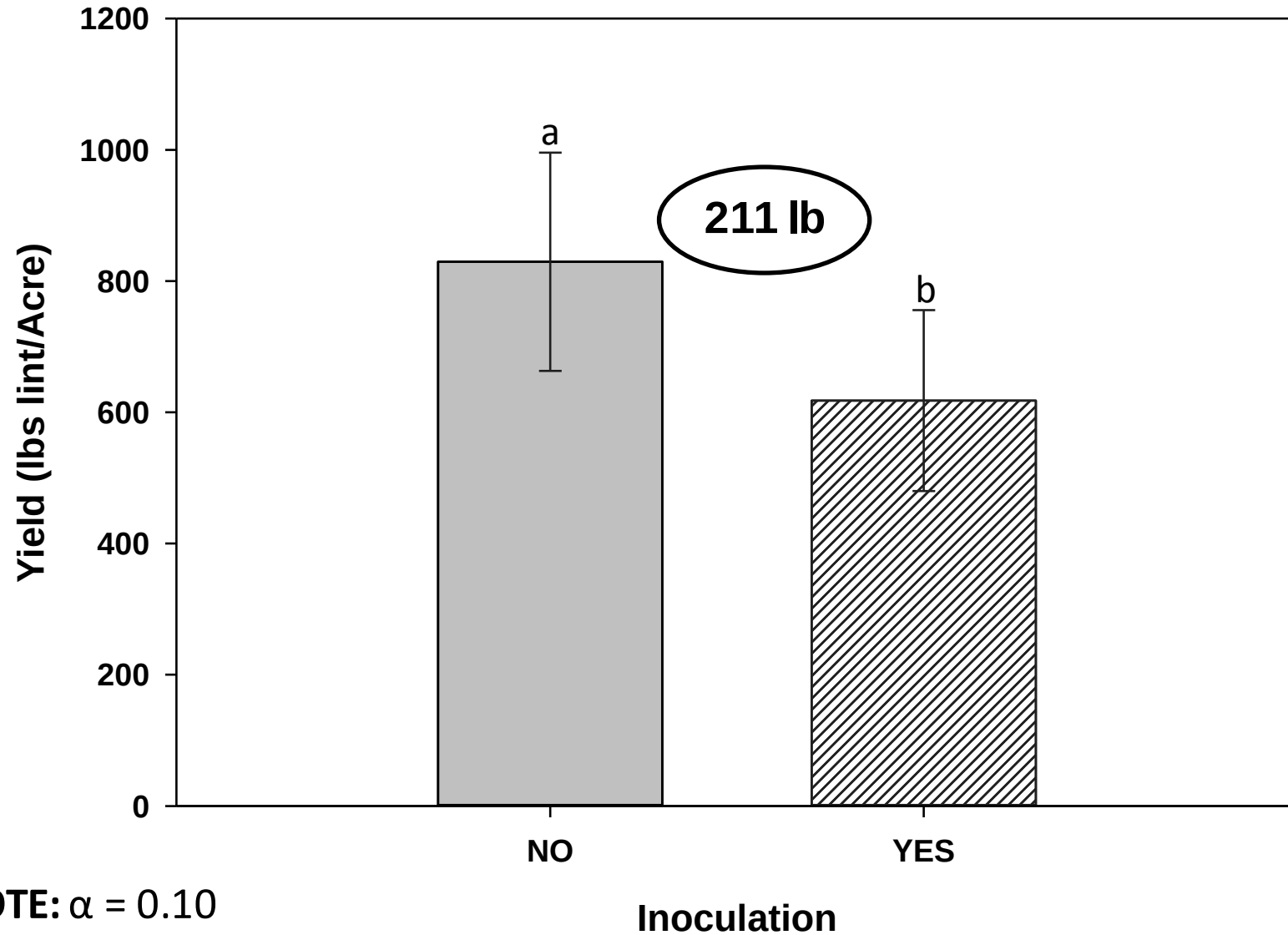
Variety	Rating (0-9)	Resistant (R) or Susceptible (S)
Americot 1550B2RF	4.7 bcd	S
DynaGro 2450B2RF	4.6 b-e	S
DynaGro 2570B2RF	4.6 b-e	S
Deltapine 0912B2RF	3.9 efg	S
Deltapine 1028B2RF	4.5 b-f	S
Deltapine 1034B2RF	4.7 bcd	S
Deltapine 1048B2RF	4.9 abc	S
Deltapine 1133B2RF	0.1 h	R
Deltapine 1137B2RF	5.4 a	S
Fibermax 1740B2F	0.2 h	R
Fibermax 9058F	0.2 h	R
HQ 210CT	4.2 d-g	S
HQ 212CT	3.8 fg	S
Phytogen 367WRF	4.8 a-d	S
Phytogen 375WRF	0.2 h	R
Phytogen 499WRF	5.2 ab	S
Phytogen 565WRF	4.4 c-f	S
Phytogen 725F	3.6 g	S
Stoneville 4145LLB2	3.8 fg	S
Stoneville 4288B2F	4.7 bcd	S
Stoneville 5288B2F	0.1 h	R
Stoneville 5458B2RF	4.5 c-f	S

Source: Allen, T.W., Golden, B., Sciumbato, G.L., and Thaxton, P. (unpublished) **NOTE:** $\alpha = 0.05$; $LSD = 0.6793$; $CV = 13.7$; $R^2 = 0.9553$

Impact on plant height



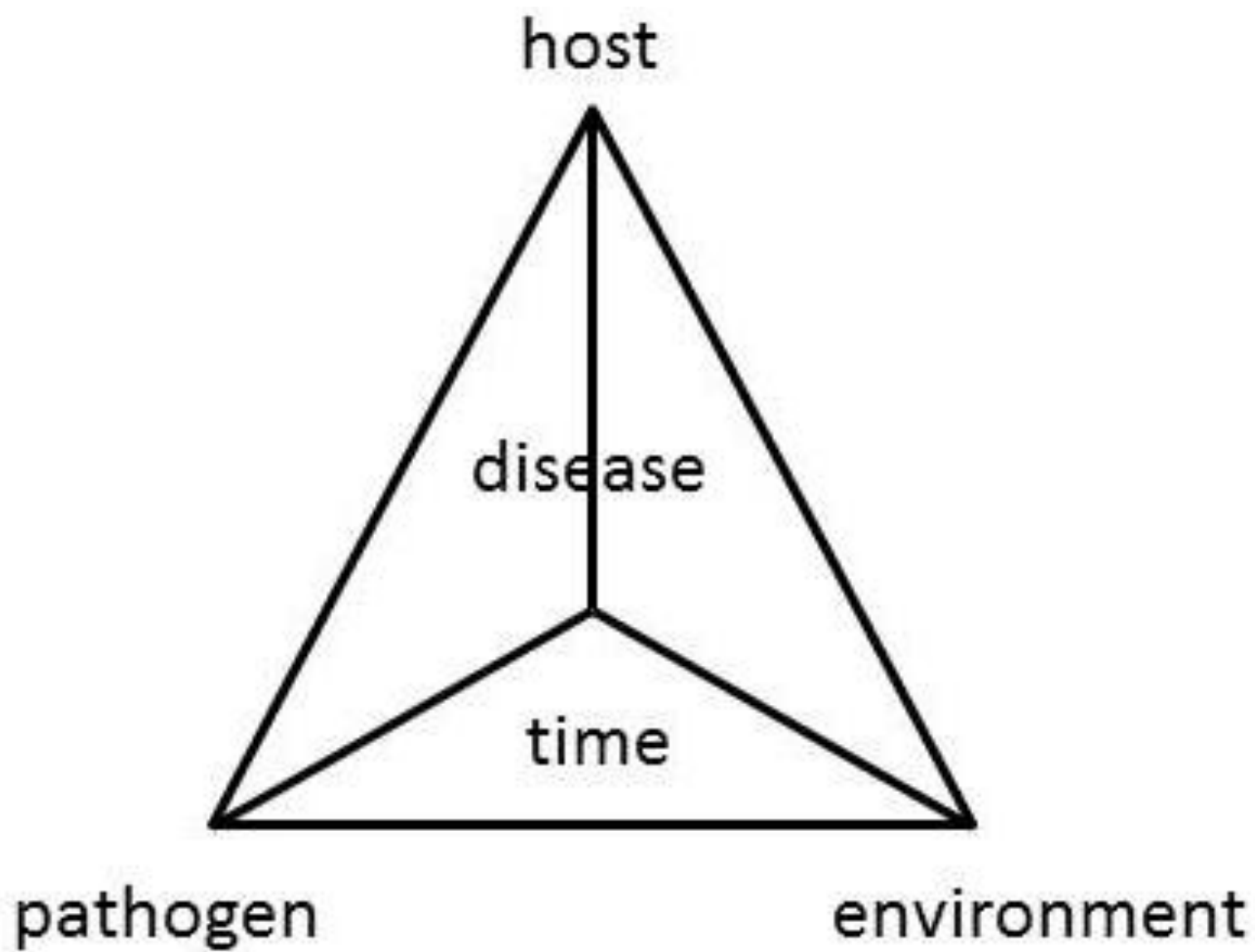
Yield (lint yield/Acre)



2012 cotton field survey

Variety	# of fields with blight	# of fields considered	Percentage infected
DPL0912	66	88	75.0%
DPL0935	2	3	66.7%
DPL1028	28	28	100%
DPL1034	138	217	63.6%
DPL1048	28	37	75.7%
DPL1050	22	28	78.6%
PHY499	9	32	28.1%
ST5458	71	237	30.0%
TOTAL	364	670	54.3%

NOTE: information obtained from a survey of 13 observers in MS



Management Options

- Tillage
 - Bury stubble rather than minimum tillage practices
- Crop rotation (non-host)
 - Corn, grain sorghum, peanut, soybean
- Plant a resistant cotton variety
 - If the particular producer encountered bacterial blight in 2011 and does **NOT** want to change the tillage system, planting a resistant variety is the best option

Rapid Bacterial Blight Test Development

- Joint project between Univ. of Ar., MSU
- Presently, screening seed lots requires tremendous period of time ($\approx$ 14-18 days)
- **Objectives:**
 - Rapid and accurate qPCR protocol
 - Field test the resulting methods
 - Comparisons with fungal leaf spots
 - Determine overall reaction of commercially available cotton varieties to bacterial blight pathogen



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