DOLLAR SPOT RESISTANCE IN SEASHORE PASPALUM

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Seashore paspalum (*Paspalum vaginatum*)

- High salt tolerance
- Coastal regions of southeastern USA
- Several cultivars are sensitive to dollar spot

Image: Paul Raymer

Dollar spot (*Sclerotinia homoeocarpa*)

- 80 years since first described
- Most common turfgrass disease in North America
- Golf course greens and fairways
- Quality and playability issues
- Common cold of turf diseases

Dollar spot on PDA

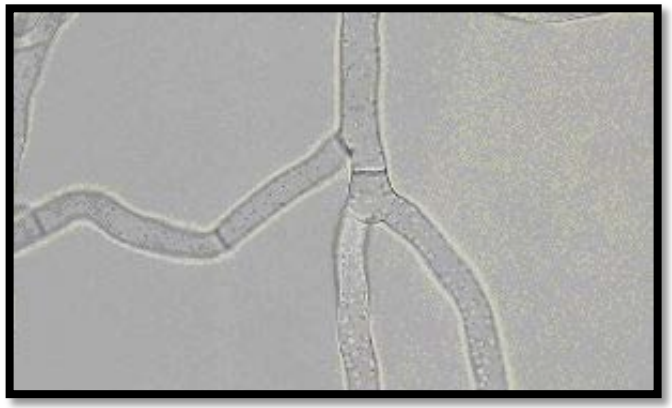
Allen et al., 2005. The Plant Health Instructor. DOI:10.1094/PHI-I-2005-0217-02

Signs and symptoms of *S. homoeocarpa*

Images: Clint Steketee and apsnet.org

Dollar spot infection process

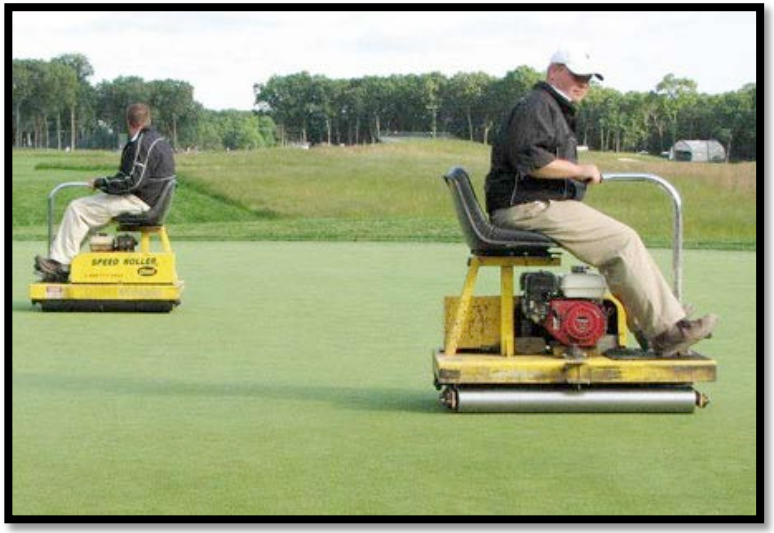
- Can occur over broad temperature range
- Hyphae can
  - Penetrate directly
  - Enter through stomata
  - Enter through cut leaf tips
- Spread by
  - Humans
  - Equipment
  - Water and wind



Images: toro.com; apsnet.org

Management – cultural practices

- Monitor fertility
  - Low N = dollar spot ⬆
- Manage thatch layer
- Removal of guttation fluids



Images: usga.org; bthbgcm.blogspot.com; sparkleberrysprings.com

Management - fungicides

- Fungicides or fungicide classes used:
  - Chlorothalonil
  - Thiophanate-methyl
  - DMI compounds
  - Dicarboximides

- Boscalid (Emerald) is relatively new and effective with no known fungicide resistance
- Pathogen must be active for fungicide to be effective
- Resistance occurs in facultative saprophytes
  - Only resistant biotypes survive and become dominant

Image and info: apsnet.org

Management - host plant resistance

Dollar spot artificial inoculation

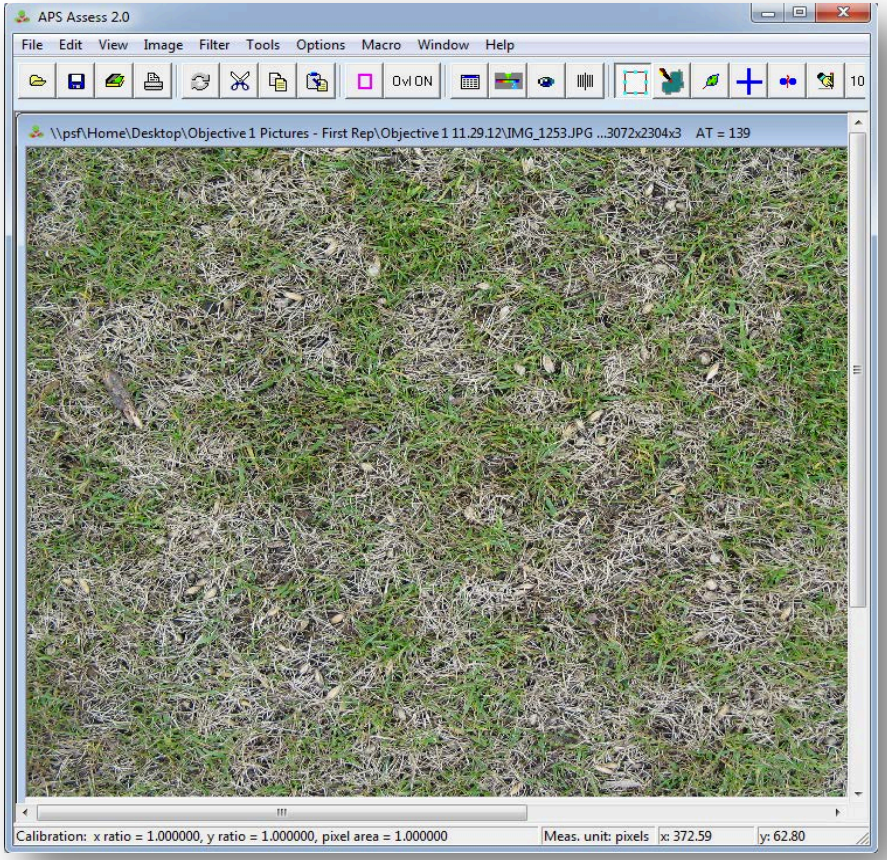
- UGA utilizes grain mixture

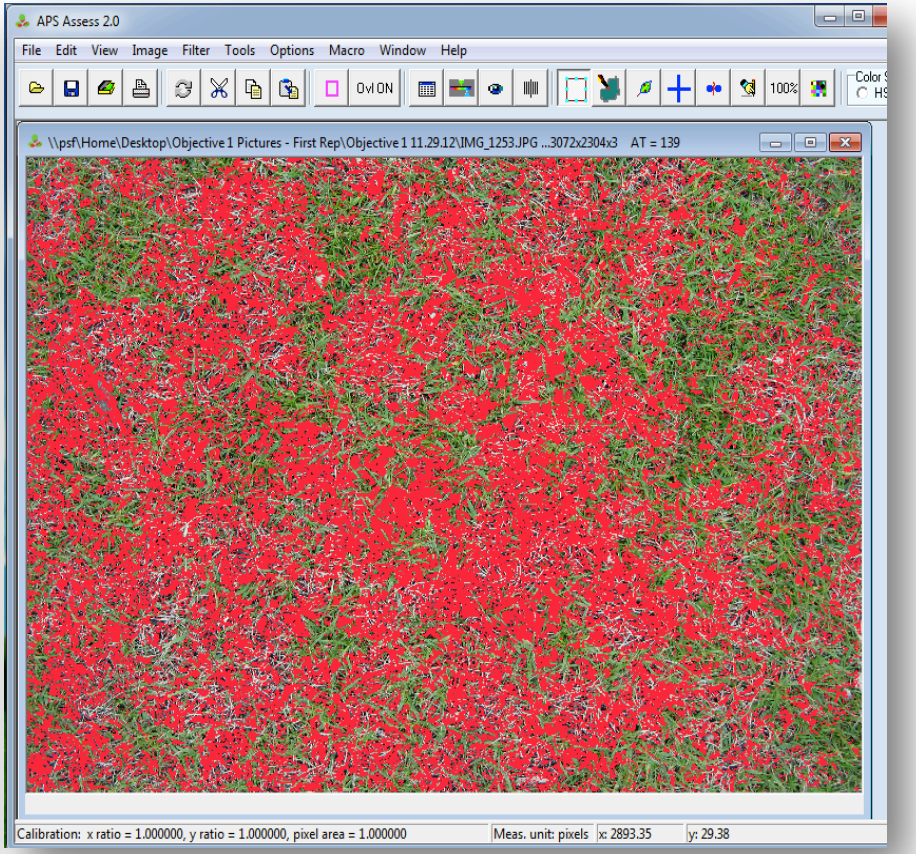
Phenotyping

- Visually rate for percent disease
- Digital image analysis (DIA)
- Analyze images with Assess®

Image: Paul Raymer

Assess® analysis example



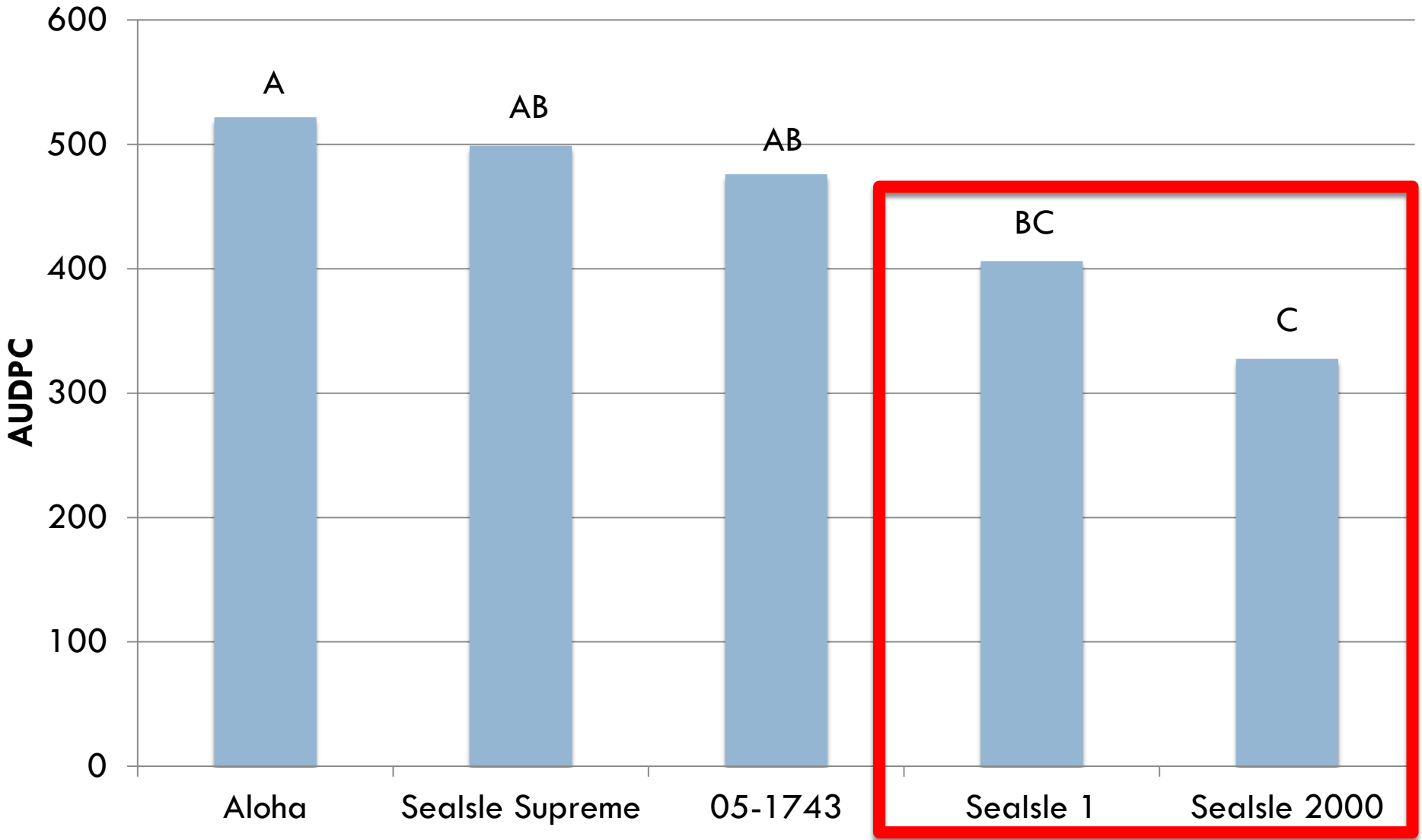


Leaf Hue: 31-191, Lesion Hue: 31-107 based on Horvath and Vargas, 2005

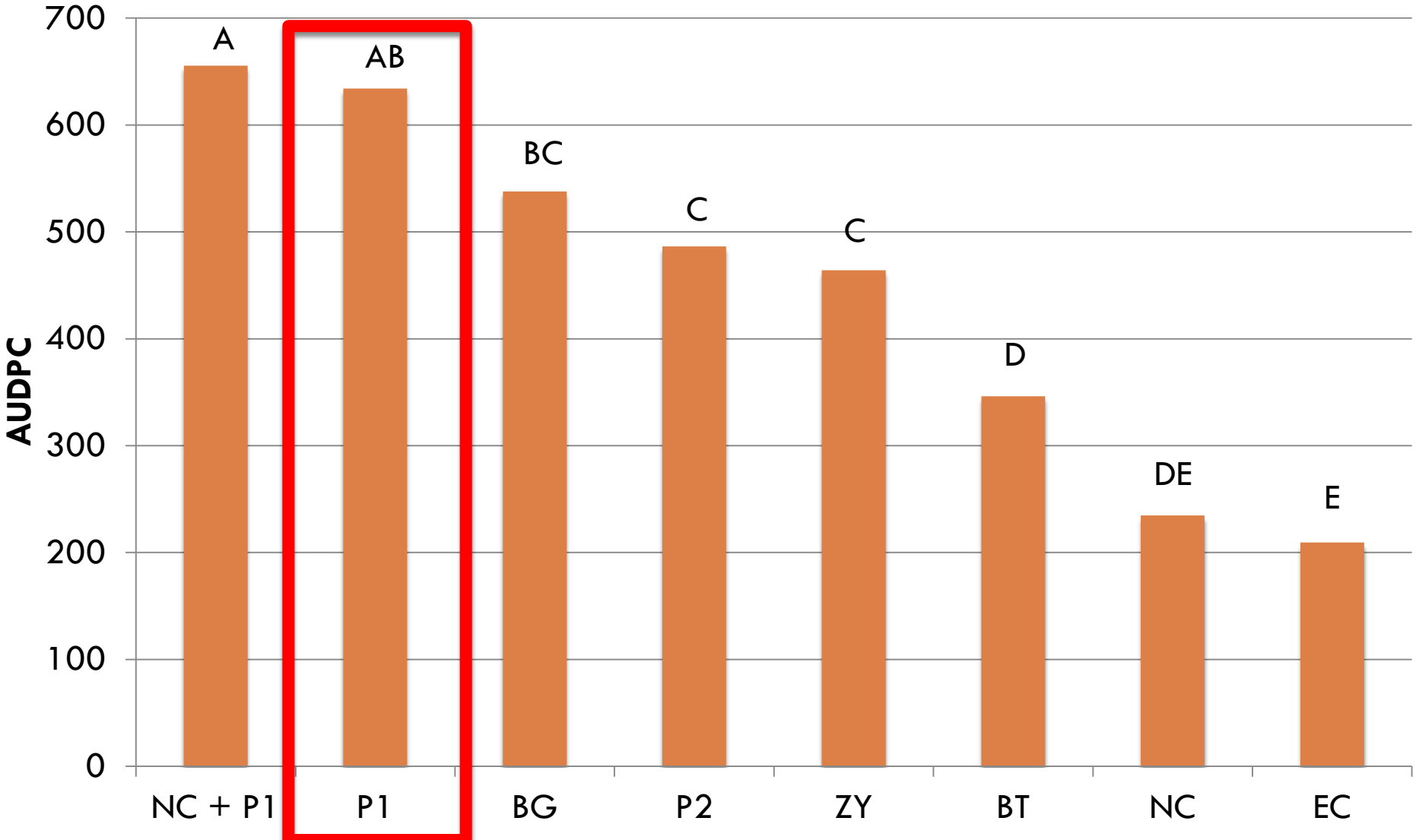
Genotype-isolate interaction

- Determine how several isolates affect paspalum lines
- Screening for resistance
  - Tested five isolates against five genotypes

Genotype differences



Isolate treatment and control differences



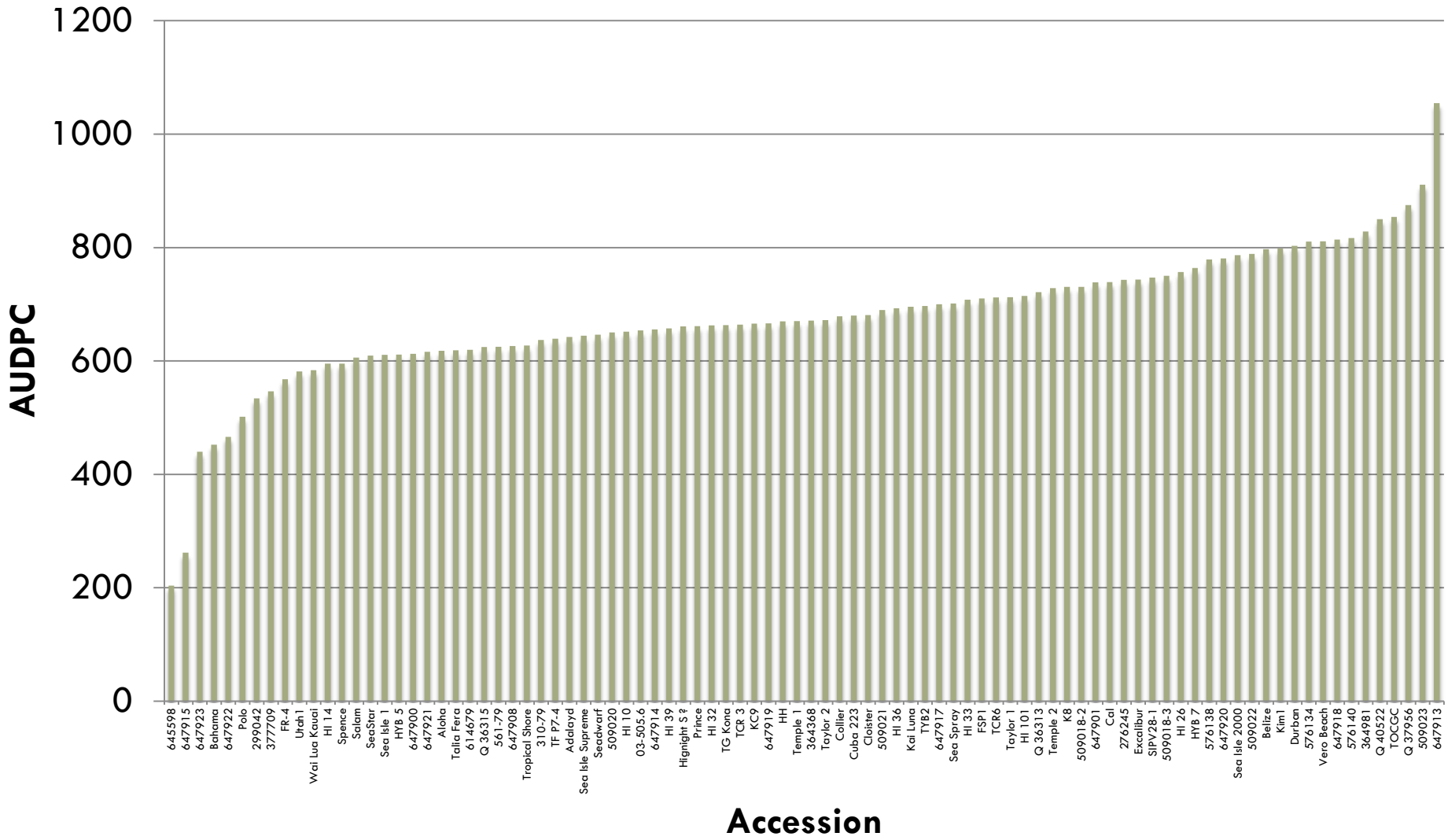
Genotype-isolate interaction conclusions

- Differences in genotype resistance and isolate virulence
- No significant interaction ($p=0.54$) – i.e. P1 caused most disease regardless of genotype tested
- Use one highly virulent isolate for screening (P1)

USDA germplasm screening

- 90 seashore paspalum genotypes
- Geographic and genetic diversity represented
- Inoculated with P1 isolate
- Goal is to find possible lines to use as parents in crosses

Resistance in the USDA collection

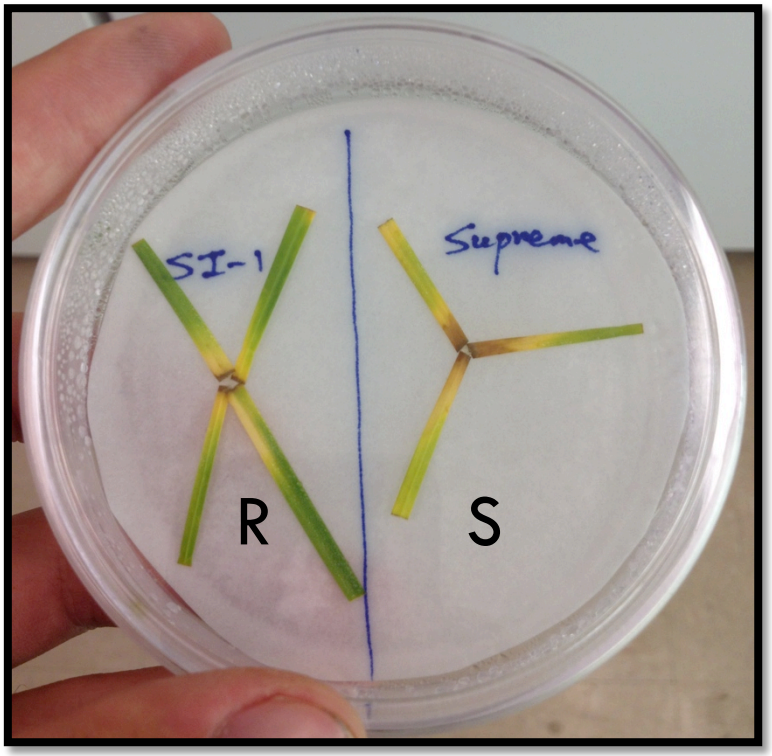


Population development ongoing

- Resistant by susceptible crosses
  - Mapping population
  - Basic genetic studies

More efficient phenotyping needed

- Detached leaf assay vs. field screening



Thank you for your attention!

- Dr. Paul Raymer
- UGA Turf Team
- Institute of Plant Breeding, Genetics, and Genomics

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