Turfgrass Breeding at the Griffin Campus

Paul Raymer



Griffin breeding projects

Seashore paspalum cultivars Non-GE herbicide resistance system Dollar spot resistance Improved drought and salt Tall fescue turf cultivars Improved drought tolerance and persistence Improved turf quality traits Herbicide resistance and reduced growth Zoysiagrass cultivar development improved heat and drought tolerance for S.E. Bentgrass Improved heat and drought tolerance

Seashore paspalum (Paspalum vaginatum)

Warm-season turfgrass Highly salt tolerant Can be irrigated with nonpotable water Excellent turf traits Tolerant to low light conditions



Invasion of bermudagrass





Develop paspalum cultivars resistant to herbicides that control bermudagrass and other weedy grasses GE options are problematic: High regulatory/registration costs Difficult to move in international markets Small market, difficult to justify costs Our Solution - Develop a non-GE herbicide-resistant system utilizing naturally occurring mutations

A non-GE herbicide resistance system for grass control in seashore paspalum using resistance to ACCase herbicides





Plant injury 14 days after treatment with various rates of sethoxydim.

The rest of the story

Initial HR mutants from tissue culture
Many additional mutations
Poor fitness
Largely sterile
SR31.15 hand pollinations x 'Sealsle 1'
Embryo rescue = 6 HR lines (heterozygotes)
Field evaluations initiated 2014

Sethoxydim resistant paspalum

Georgia Tall Fescue Breeding

- 'Southeast' -Released in 1999
 'Tenacity' Released in 2003
 'Bulldog 51' Released in 2005
- Improved persistence
 Poor turf quality

New Goals

- Utilize existing breeding materials with improved acid soil tolerance
- Improve turf quality traits
- Improve disease resistance
- Incorporate herbicide resistance
 Reduce mowing

Characterization and Validation of Molecular Markers Linked to Heat and Drought Tolerance for Marker Assisted Selection of Stress-tolerant Creeping Bentgrass

Cooperators

Dr. Alfredo Martinez Dr. David Jespersen Dr. Zhenbang Chen Dr. Katrien Devos Dr. Meliane Harrison Dr. Karen Harris-Schultz Dr. Patrick McCullough Dr. Wayne Parrott Dr. Paul Raymer Dr. Brian Schwartz Dr. Clint Waltz

Turf Pathologist Stress Physiologist **Biotechnologist Molecular Geneticist** Germplasm Curator **Molecular Geneticist** Weed Scientist Biotechnologist Breeder Breeder **Turf Agronomist**

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Griffin Campus Turfgrass Research and Education Building