A-LIST: An Introduction

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MISSION

A-LIST is an independent, non-profit, industry initiative, fostering development of sustainable turfgrass varieties and related products that perform their function with less maintenance inputs, this benefitting the environment.

A-LIST seeks to influence turfgrass breeding by creating trial guidelines and evaluation protocols to identify the best performing turfgrass varieties under reduced inputs and management.
A-LIST: MEMBERS

- DLF Pickseed
- Lebanon Turf
- Mountain View Seed
- Landmark Turf & Native Seed
- Seed Research of Oregon
A-LIST: COOPERATORS

- Rutgers University  
  Dr. William Meyer  
  Dr. Stacy Bonos
- Purdue University  
  Dr. Cale Bigelow
- University of California-Riverside  
  Dr. James Baird
- North Carolina State University  
  Dr. Grady Miller
- Utah State  
  Dr. Kelly Kropp
- University of Connecticut  
  Dr. Victoria Wallace
- Michigan State University  
  Kevin Frank
- University of Wisconsin  
  Dr. Doug Soldat
A-LIST: GOALS

- High turf quality is important (NTEP tested)
- Drought tolerance
  - Stays green during periods without irrigation
  - Recovers rapidly after dormancy
  - Can be maintained with reduced irrigation
- Reduced fertilizer required
- Disease resistant - less fungicides
- Reduced inputs to achieve functional goals
A-LIST: PROTOCOLS

- Rainout shelter: no current trials
- Fall establishment
- Fungicide at Establishment Only: Segway (for Pythium RATE?)
- Herbicide at Establishment Only: Tenacity (5 oz/1000 sq. ft.)
- Fertility
  - Establishment: 1.5 lbs. of Nitrogen/1000 sq. ft.
  - Maintenance: 1 lb./1000 sq. ft. following spring
  - P per soil test
- Mowing height: 2.5 inches (or appropriate for species and region)
- Begin withholding irrigation: July 1 (combined effects of heat and drought)
A-LIST: PROTOCOLS

Trial Locations to Date:

- Tall Fescue and Kentucky Bluegrass
  - Fall 2013: Rutgers, UC-R, NCSU
  - Fall 2016: Utah State, Rutgers, UCONN, University of Wisconsin, Michigan State

- Fine Fescue
  - Fall 2014: Rutgers, Purdue

- Perennial Ryegrass
  - Spring 2015: Peak Plant Genetics (OR), DLF (OR), UC-R
  - Fall 2015: Rutgers, Purdue
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Control Varieties for initial tests:

- Kentucky bluegrass:
  - Kenblue, Midnight, Merit, Volt
- Tall fescue:
  - Avenger, Picasso (high drought tolerance in 2001 NTEP), Crossfire II (1996 NTEP)
- Fine fescue: Boreal and Pennlawn
- Perennial ryegrass: Linn, Divine and Charismatic
A-LIST: PROTOCOLS

DATA COLLECTION:

- Temperature and ET rates
- % Green cover & Density: Digital
- Turf Quality: Subjective (Agronomist’s Scale 1-9)

Frequency of Data Collection:
- % green cover: 1-2 times per week during dry down
- Turf Quality: monthly (more frequently at discretion of cooperator)
- Density: monthly after turf is established

- Additional data (e.g. disease) collected at discretion of cooperator
A-LIST: PROTOCOLS

DROUGHT (eastern US):

- Withhold water beginning July 1
- Re-water: when last plot reaches 25% green cover, irrigate with 2 inches water, followed by 1 inch per week until full recovery (100% green cover)
- Record recovery time i.e. fastest to green-up
A-LIST: PROTOCOLS

DROUGHT (western US):

- Reduced Irrigation:
  - 60% ET: 2nd year Tall Fescue & KBG
    Site: UC Riverside – Initiated June 1
  - 50% ET: 1st year Perennial ryegrass
    Site: DLF Research, planted June 1, initiated August 1
  - Stop water at 60 days growth: Perennial ryegrass
    Site: Peak Plant Genetics, planted June 1
- Record data as in eastern US
A-LIST: PROTOCOLS

Data Analysis

- All data were subjected to ANOVA
- Means were separated using Fisher’s protected least significant difference (LSD) test at $p < 0.05$
FUTURE TRIALS

- Current trials terminated after 2\textsuperscript{nd} season
- 3\textsuperscript{rd} season may be included by agreement between cooperators & A-LIST

- New A-LIST trials will align with new NTEP trials
- This allows most current germplasm to be tested
PROTOCOL FOR “A-LIST APPROVED VARIETY”

1. Demonstrated superior performance in A-LIST trials as defined by:
   - The top LSD group for drought tolerance
     • As measured by % green cover
     • For each of TWO YEARS
     • In AT LEAST TWO LOCATIONS
   - Acceptable or better turf quality
     • For each of TWO YEARS
     • In at least TWO LOCATIONS

2. Entered into an NTEP trial for the species
   - If new cultivars have met approval standards in A-LIST trials, final approval will be withheld until the cultivar(s) have been entered into NTEP
“A-LIST APPROVED LIST” OVER TIME

- Only a select few varieties will make the approved variety list
- As newer varieties are added to the approval list over time, older varieties will be transitioned off of the approved list during a 12 month period
- The A-LIST strives to ensure that only the best performing varieties are part of the program
‘PROMISING’ VARIETIES

- Varieties denoted as ‘promising’ are grasses that did well for both drought tolerance and turf quality in the first year of the trial(s) by meeting ALL of the standards for approval EXCEPT two years of field data in at least two locations as required for full approval;
- Status as a ‘promising’ variety does not guarantee final approval;
- ‘Promising’ varieties are reevaluated after the second season of field data and must meet all of the standards of approval.
‘A-LIST APPROVED’ BLENDS

ALL blends that carry the ‘A-LIST approval’ MUST:

- Contain MINIMUM 65% ‘A-LIST Approved’ Varieties
- Contain balance (maximum 35%) of ‘Bonafide’ Turf Varieties
  - NO forage varieties
  - NO ‘variety not stated’ material
  - NO uncertified common varieties
- Include the “A-LIST Approved” Tag
A-LIST: Potential Water Savings

- **First year trial UC Riverside**
  - 2 drought cycles – 4.0 and 3.5 inches of ET over 2 weeks period each time = 7.5 inches
  - 2 inches of water used for recovery = 4 inches = 3.5 inches X 680 gallons / inch of water / 1000 sq. ft. saved =
    - 2380 gallons of water for each 1000 sq. ft. saved

- **Second year trial UC Riverside**
  - 6 weeks at 60% ET = 10 inches of ET = 6 inches of water applied
  - 4 inches of water saved
  - 2720 gallons of water for each 1000 sq. ft. saved
  - Number from Irrigation / Turf sites = 4000 gallons of water / 1000 sq. ft.
The Testing Requirement is the Difference

Requirements ‘A-LIST APPROVAL’:

- Must be NTEP Tested
- Must meet ALIST Trial performance 2 years at 2 locations
- No fungicides allowed (other than Pythium control at seeding)
- Low nitrogen rates
- Drought (both chronic and no water) under heat stress
- Cultivars must meet performance standards for usage (TQ)
DROUGHT RESISTANCE/DECREASED WATER USE

- What is drought resistance?
- Drought resistance = Drought avoidance + drought tolerance
- Drought avoidance
  - Deep roots
  - Thick cuticle
  - Smaller stomates
  - Dormancy or escape (completes life cycle)
- Drought tolerance
  - Internal decrease in water - keeps growing
  - Survives desiccation
DROUGHT RESISTANCE/DECREASED WATER USE

- Decreased Water Usage
- Two methods:
  - Maintained at below 80% ET - always in deficit
  - Allowed to wilt - Recharge soil profile
- Low maintenance management
- Influences:
  - Heat
  - Soil type
  - Management before drought
  - Diseases, insects, nematodes