



## New Plant Materials for Reduced Input Turfgrass

- **Collect and evaluate** seeds representing a broad array of species from Eurasia. These collections may have potential for increased drought and salt tolerance over currently used turf grasses.
- From this evaluation, promising seed sources will be introduced into the **breeding** (variety development) program for **release** of improved reduced-input turf grasses for the western U.S.

## Turfgrass Breeding Approach

Collection and evaluation of plants



Plant collection in Mongolia



Observation of collected plants



Evaluation and breeding



Small plot evaluation and selection

Early season senescence



Crossing block



Late season senescence



Release of low maintenance plant materials



Urban applications



Restoration applications

Seed available from the Utah Crop Improvement Association  
1-435-797-2082

## ARS Mission

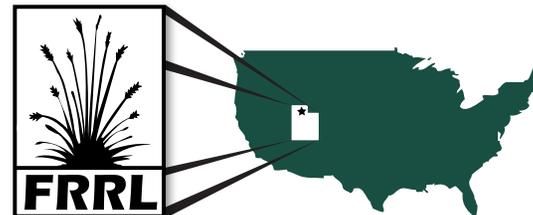
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- enhance the natural resource base and the environment, and
- provide economic opportunities for rural citizens, communities, and society as a whole.



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**PLANTS FOR THE WEST**

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# REDUCED-INPUT TURFGRASS

## VISION

Develop an internationally recognized turfgrass improvement program that specializes in abiotic stress and resource-use efficiency for semi-arid environments.

## RESEARCH OBJECTIVES

1. Develop improved varieties of turfgrass with excellent turf quality for droughty and limited-irrigation conditions.

**Outcomes**  
Improved varieties will decrease demands on limited western U.S. water supplies by providing alternatives to typical turfgrass varieties that have higher irrigation requirements.



Turfgrass evaluation at Logan, UT

These improved varieties, despite using less water, will provide the high level of turfgrass performance.

2. Develop improved varieties of turfgrass with increased salinity tolerance.

**Outcomes**  
Increasing salinity tolerance in turfgrass will allow irrigation with lower quality water, including secondary supplies from water treatment facilities, and saving principal water resources for non-landscape usage.

Soil salinity levels are high in many areas of the western U.S. Improved salinity tolerance in turfgrass will increase the options available to land managers when planting in these areas.

3. Develop varieties of wheatgrasses for turfgrass use.

**Outcomes**  
Introduced and native wheatgrasses provide turfgrass options with acceptable turfgrass quality under conditions of very low maintenance, including areas with no available irrigation.

4. Identify new sources of genetic material for improved turfgrass under reduced-input conditions.

**Outcomes**  
Untapped genetic resources will be the source of improved traits in currently used turfgrasses and in potential novel turfgrass species.

## IMPROVED PLANT AND MANAGEMENT PRACTICES:

### Kentucky Bluegrass

- Develop Kentucky bluegrass varieties with increased salinity tolerance that can be irrigated with lower quality water and used on soils with high salt content.
- Develop Kentucky bluegrass germplasm with increased drought tolerance that requires less irrigation to maintain high turf quality.
- Identify genes and pathways controlling drought and salinity tolerance in bluegrass. This information will result in more efficient development of improved varieties.



Bluegrass for turf under variable irrigation

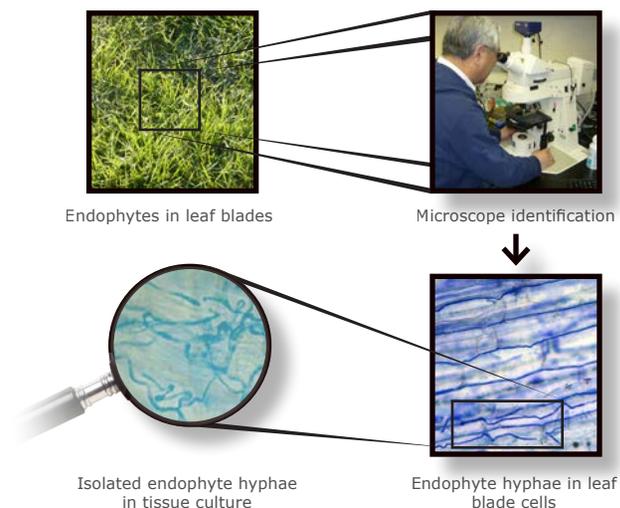
### Fine Fescue

- Develop improved varieties of fine fescue with increased drought and salt tolerance.
- Develop fine fescue varieties specifically for use in mixtures with other turfgrass species. Successful turfgrass mixtures will provide quality turfgrass with lower inputs.
- Identify sources of fine fescue germplasm from dry areas of central Asia with potential turfgrass value in the western U.S. This germplasm will provide novel genetics for the improvement of fine fescue.
- Identification of beneficial endophytic fungi (i.e., hyphae) with potential to increase stress tolerance of grasses for reduced-input conditions.



Fine leaf (left) and coarse leaf (right) turf

### Identification and characterization of plant endophytes



### Crested and Native Grasses

- Develop improved varieties of crested wheatgrass for use in low-input turf. A forthcoming variety will be called RoadCrest II, and will have improved turfgrass characteristics when compared to the original RoadCrest.
- Develop varieties of the rhizomatous native species thickspike wheatgrass specifically for reduced-input turfgrass settings.
- Develop species mixtures with crested wheatgrass that have enhanced turf quality and sod production for use in low-input turf landscapes. The result will be increased commercialization of crested wheatgrass turf mixtures. Improved sod for low-input landscapes will meet a growing demand throughout the Intermountain west.



Low-input turf evaluation