

Low Input Sustainable Turfgrass: A regional cooperative research project

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Irrigation, fertilization and application of pesticides are needed to maintain healthy turfgrasses. Due to dwindling water resources and increased environmental concerns over the use of fertilizers and pesticides on turfgrasses, there is an increasing need to minimize the inputs to maintaining turfgrasses. Most of the turfgrass species that are currently in use requires a relatively high level of input to maintain acceptable turf quality, although breeding effort of developing turfgrass cultivars with enhanced biotic and abiotic stress tolerance can be an effective strategy to reduce input. An alternative approach to this problem, however is to search and find other grass species that require minimum input yet can maintain acceptable turf quality. Great genetic variability of drought resistance, nitrogen needs, disease or insect resistance exists among different grass species. The objective of this project is to identify alternative grass species that are adapted to this region with minimum input and to obtain information on best management practice for each species identified. This project is part of the regional effort involving 11 mid-west land-grant universities.

Materials and Method

A total of 13 species are used for this project. The cultivar name, species name and seeding rate are described as follows:

- A: 'RoadCrest' Crested Wheatgrass 5 lbs / 1000 ft²
- B: 'LMC-1122' Meadow Fescue (*Festuca elatior*) 7 lbs / 1000ft²
- C: 'Spike' Tufted Hairgrass (*Descampsia caespitosa*) 1 lb /1000 ft²
- D: 'Blacksheep' Sheep fescue (*Festuca ovina*) 7 lbs/1000ft²
- E: 'Berkshire' Hard fescue (*Festuca longifolia*) 6 lbs/1000 ft²
- F: 'LMC-5000' Prairie Junegrass (*Koeleria cristata*) 2 lbs/1000 ft²
- G: 'Fults' Alkaligrass (*Puccinellia distans*) 1.5 lbs /1000 ft²
- H: 'HB 342' hybrid bluegrass (Kentucky bluegrass X Texas bluegrass) 2 lbs/1000 ft²
- I: 'Dura Blue' Hybrid bluegrass (Kentucky bluegrass X Texas bluegrass) 2 lbs/1000 ft²
- J: 'ShadeStar' Crested dogs tail (*Cynosurus cristatus*) 1.0 lb/1000 ft²
- K: 'Bad river' Blue grama 3 lb/ 1000 ft²
- L: 'SR7150' Colonial bentgrass 1 lb /1000 ft²
- M: 'Grande II' tall fescue 7 lbs /1000 ft²

Field plots were established on September 7, 2004 with an entry plot size of 3' x 5'. Efforts were made to ensure successful establishment including the use of a starter fertilizer (P₂O₅ at 98kg per ha and 49 kg N per ha) and irrigation. Trimec[®] Classic was applied in April 2005 to control broadleaf weeds. No preemergent herbicides were applied. Three mowing heights of no mowing, 3.5" and 2" are applied to each species. Plots were mown every month during the growing season except for the no mow treatment. The experiment is a random complete block design with three replications.

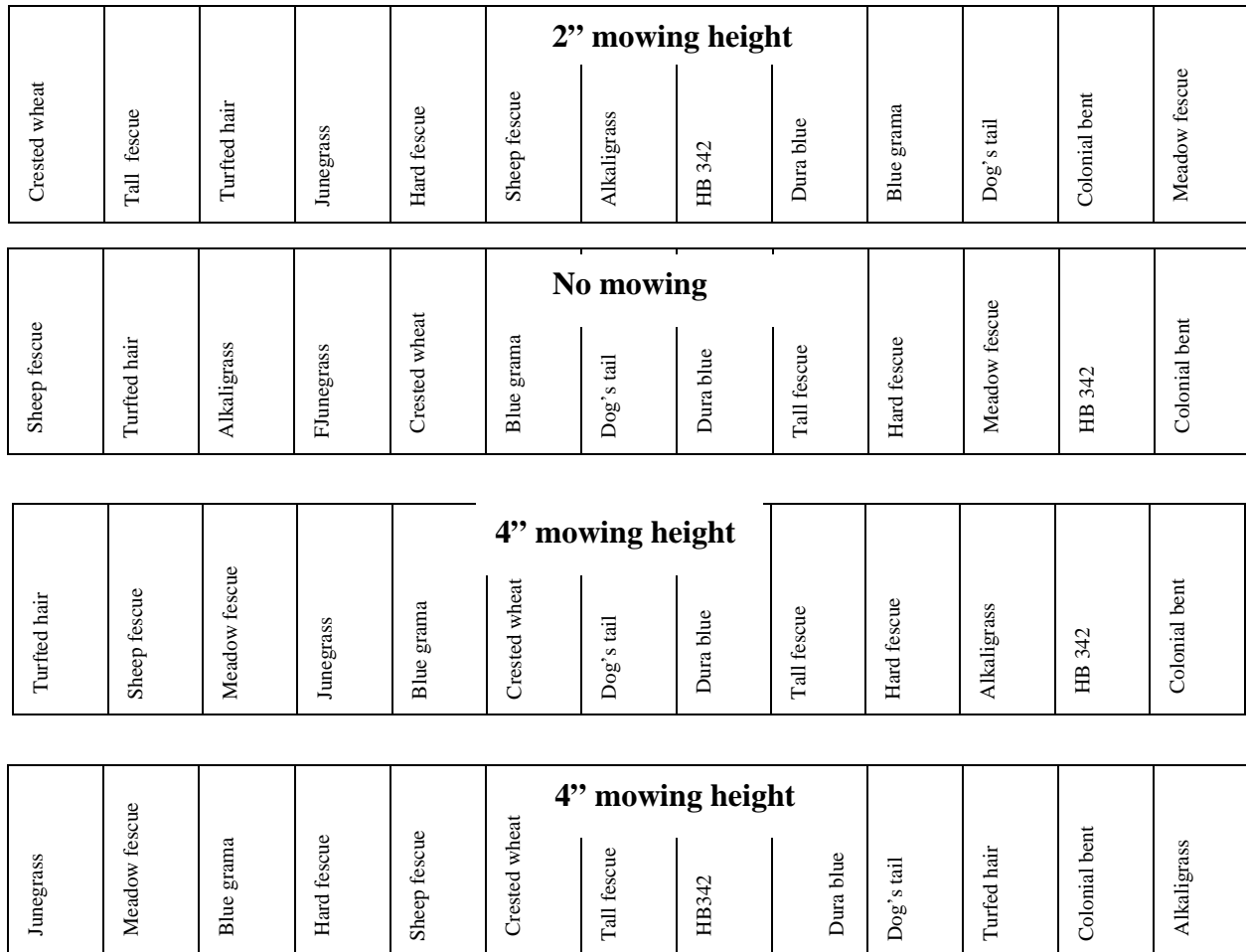
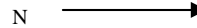
Results

Quality data were taken in the month of May, July and September in 2005. Table 1 shows the quality data for all 13 species under three mowing regimes. Tall fescue, meadow fescue, hard fescue as well as sheep fescue consistently performed well under all three mowing regimes from May to September. Colonial bentgrass's quality and coverage improved considerably from May to September under all three mowing regimes. Tufted hairgrass also performed well, particularly when mown at 3.5". Data from 2006 and other participating universities will enable us to make recommendations on alternative species that can be grown in our region with minimum input.

Table 1. Visual quality of 13 grass species in May, July and September with no mowing or mowed at 2” or 3.5” mowing height once a month.

	No mowing			2”			3.5”		
	May	July	Sept	May	July	Sept	May	July	Sept
Crested wheatgrass	6.0	5.3	4.7	6.0	5.0	4.3	7.7	5.3	3.3
Tall fescue	8.3	9.0	8.0	8.3	8.7	8.0	8.7	8.7	8.0
tufted hairgrass	5.0	6.3	5.0	6.0	6.0	7.0	6.3	8.0	7.3
Junegrass	4.7	4.0	6.0	5.9	5.3	5.7	4.7	4.7	6.0
Hard fescue	7.0	8.7	6.7	8.5	9.0	8.0	8.3	8.3	8.0
Sheep fescue	8.0	9.0	7.7	8.8	8.7	8.0	8.7	8.3	8.0
Alkali grass	5.7	4.3	5.3	6.2	5.3	5.3	4.7	3.3	5.0
HB342	3.3	2.3	5.0	4.3	1.7	5.3	3.7	2.0	5.0
Dura Blue	2.7	3.3	4.0	3.2	4.3	5.7	3.0	3.3	4.7
Blue grama	2.7	1.7	3.0	2.4	1.0	2.3	2.3	1.0	2.0
Dog's tail	3.7	4.3	4.3	3.4	4.0	4.7	3.7	4.7	6.7
Colonial bentgrass	4.0	8.0	7.7	5.5	7.3	8.3	4.0	7.3	7.7
Meadow fescue	9.0	8.7	7.7	7.8	5.7	7.3	9.0	8.0	7.3

Appendix 1: Field layout of the LIST project (Ames, IA)



Sheep fescue	
Blue grama	
Meadow fescue	
Junegrass	
Tufted hair	
Crested wheat	
No mowing	
HB342	
Dura blue	
Tall fescue	
Hard fescue	
Alkali grass	
Colonial bent	
Dog's tail	

Sheep fescue	
Colonial bent	
Meadow fescue	
Junegrass	
Crested wheatgrass	
2" mowing height	
Dog's tail	
Tufted hair	
Dura Blue	
Tall fescue	
Hard fescue	
Alkali grass	
HB342	
Blue grama	

Tall fescue	
Colonial bent	
Tufted hair	
Sheep fescue	
Hard fescue	
2" mowing height	
Junegrass	
Alkali grass	
HB 342	
Dura Blue	
Dog's tail	
Blue grama	
Crested wheatgrass	
Meadow fescue	

Blue grama	
HB 342	
Meadow fescue	
Junegrass	
Tufted hair	
Colonial bent	
4" mowing height	
Dog's tail	
Sheep fescue	
Tall fescue	
Hard fescue	
Alkali grass	
Crested wheat	
Dura Blue	

Dura Blue	
Dog's tail	
Meadow fescue	
Junegrass	
rested wheatgrass	
No mowing	
Blue grama	
Tufted hair	
Sheep fescue	
Tall fescue	
Hard fescue	
Alkali grass	
HB 342	
Colonial bent	