Low-Input Nativegrasses and Alternative Groundcovers for the Southwest U.S.A.

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Background

The desire for using nativegrasses and groundcovers for the landscapes of the southwest United States is gaining interest. This study was conducted to evaluate the performance of nine native and two non-native plant species as low input and minimum maintenance plant materials when turfgrass is removed from non-play areas of golf courses or other landscapes.

Objectives

1. Evaluate the performance of nativegrasses and alternative groundcovers in the low desert southwest United States as low input turfgrass replacements in non-play areas of golf courses.
2. Generate local research-based information on the feasibility of growing new groundcovers and the nativegrasses by properly assessing their interactions with insect pests and weeds, water, and fertility requirements.
3. Increase the awareness by turf and landscape managers about the characteristics of nativegrasses and alternative groundcovers for low water use requirements and potential resource saving capacity.

Materials and Methods

A multi-year field trial consisting of nine native and two non-native plant species (Table 1) was initiated in a field experiment in Scottsdale, AZ. Plants were seeded or plugged on May 31, 2016 in replicated small plots and established under sprinkler irrigation receiving an equivalent of 9 mm/day. After mid-July, plants were grown receiving an equivalent of 6 mm/day. In September, irrigation was reduced to an equivalent of 4 mm/day. Beginning in November, irrigation was suspended for the winter and then resumed in mid-April 2017 at an equivalent of 4 mm/day. Data were collected for plant emergence, growth in height, and visual estimates of quality for color, percent ground cover, and aesthetic value. Data were analyzed using JMP statistical software and means compared using Student's t-test.

Table 1. Alternative planting materials for landscapes in Scottsdale, Arizona in 2016

Common name	Scientific name	Seed rate (kg/ha)
Alkali sacaton	*Sporobolus airoides*	3.36
Alkali muhly	*Muhlenbergia asperifolia*	1.35
Blue grama	*Bouteloua gracilis*	4.48
Buffalograss	*Bouteloua dactyloides*	244.00
Teff	*Eragrostis tef*	5.60
Plains lovegrass	*Eragrostis intermedia*	1.12
Big galleta	*Hilaria rigida*	195.00
Sand dropseed	*Sporobolus cryptandrus*	1.12
Spike dropseed	*Sporobolus contractus*	1.12
Desert zinnia	*Zinnia acerosa*	2.47
Kurapia	*Lippia nodifora*	17628 (plugs/ha)

Results and Discussion

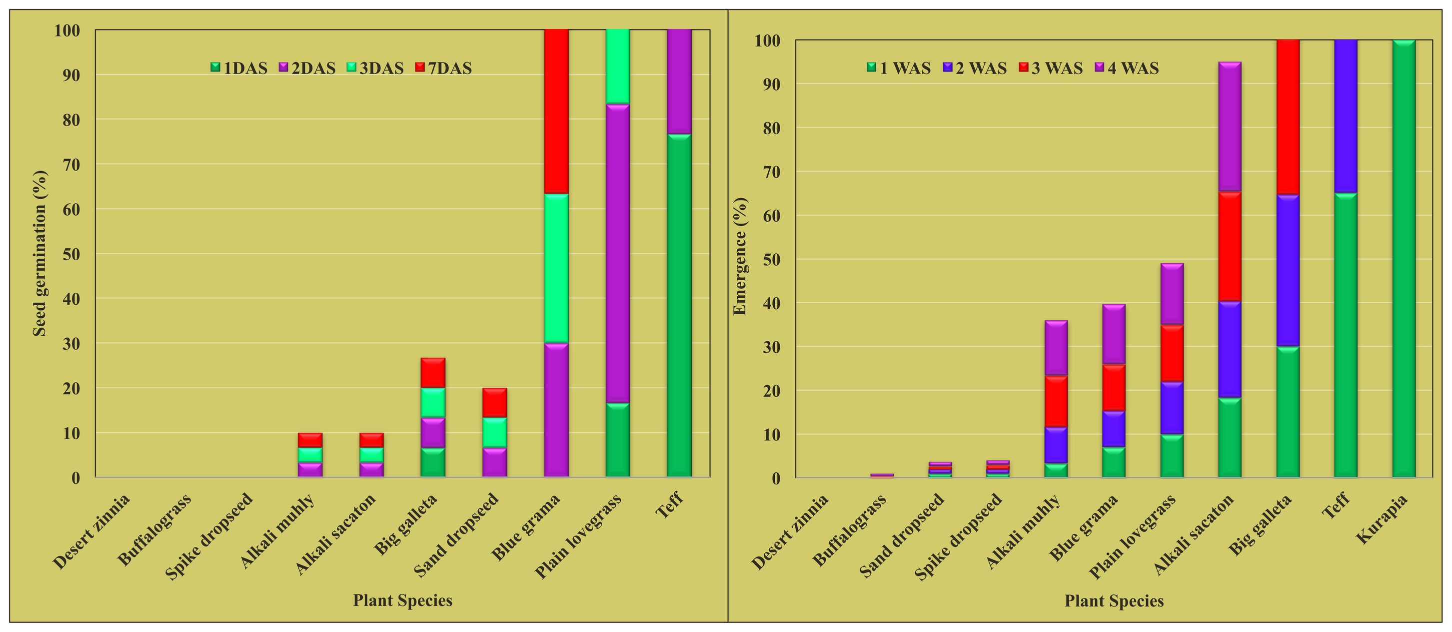

Figure 1. Nativegrasses seed germination in the laboratory (left) and stand establishment in the field at Camelback Golf Club (right) in the 2016 study at Scottsdale, AZ. DAS-days after seeding; WAS-weeks after seeding.

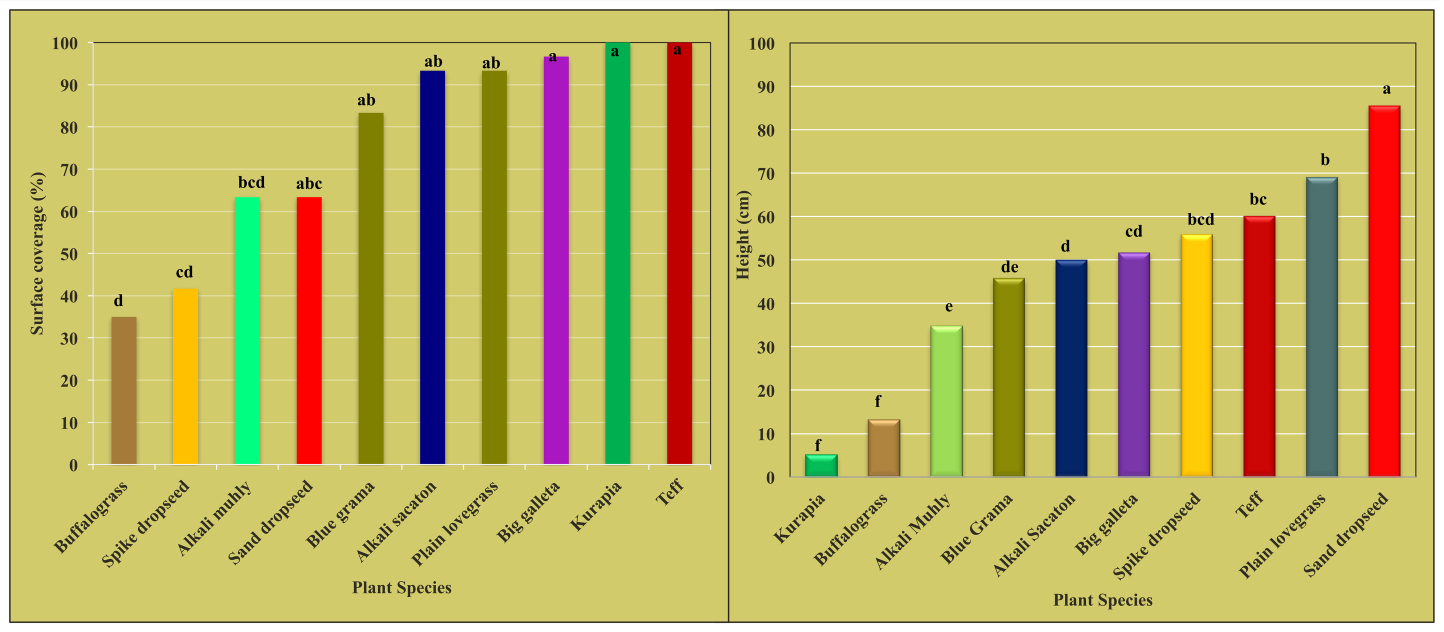

Figure 2. Percent surface area coverage (left) and heights (right) of nativegrasses and groundcovers 8 weeks after planting at Scottsdale, AZ. Bars designated by the same letter are not significantly different at α = 0.05.

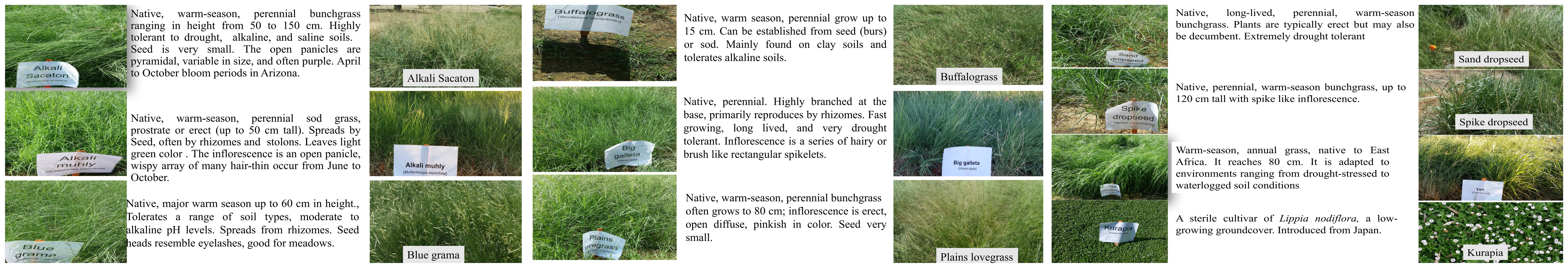

Figure 3. Nativegrasses and groundcovers establishment and growth performance evaluation at Camelback Golf Club, Scottsdale, AZ in 2016-17.

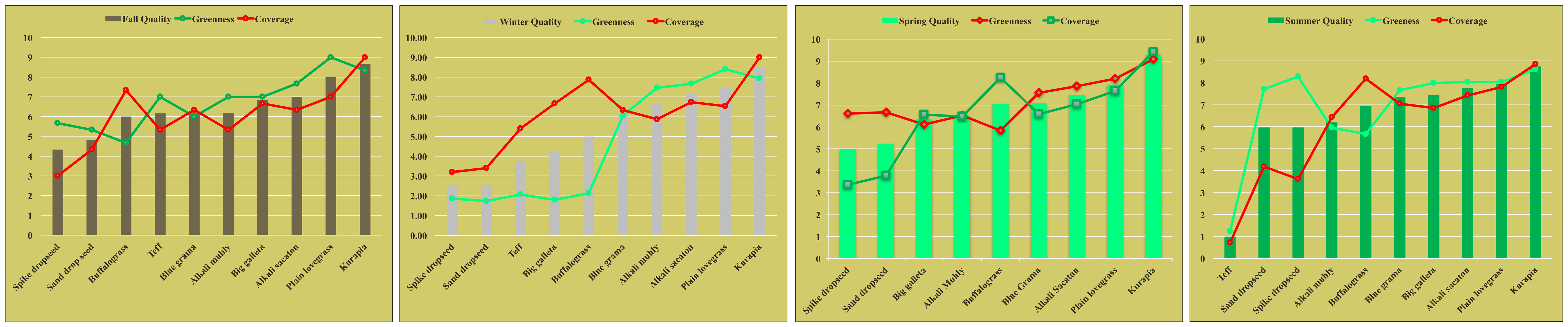

Figure 4. Performance of nativegrasses and groundcovers during fall (4 mm/day irrigation), winter (no irrigation), spring (4 mm/day) and summer (7.7 mm/day) time at Scottsdale, AZ in 2016-17.

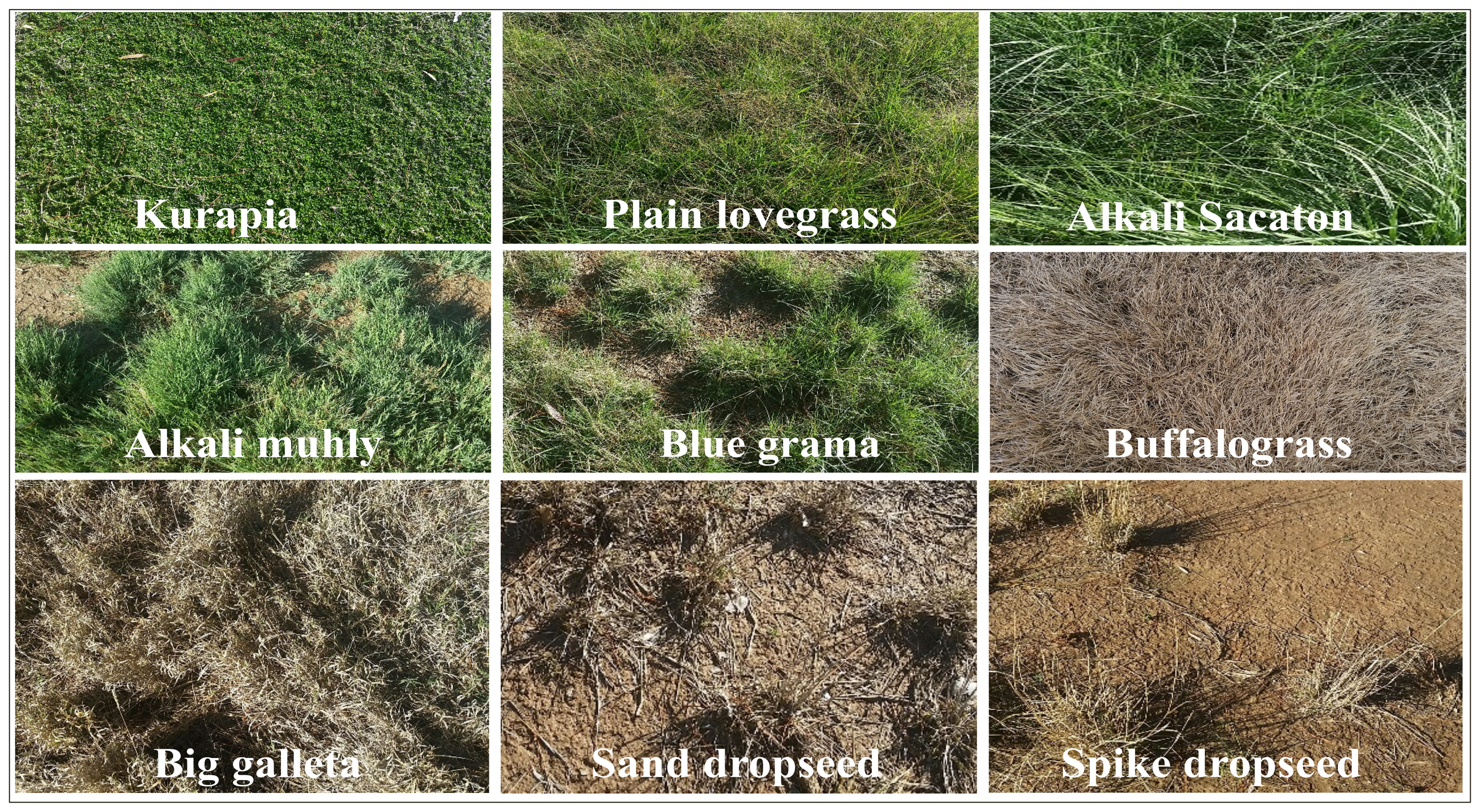

Figure 5. Evaluating quality of nativegrasses and groundcovers in winter at the end of January, 2017 in Scottsdale, Arizona. Note appearance differences in color of plants.

Figure 6. Kurapia functionality for erosion control (upper left); beautiful appearance when mowed (upper and lower right) in a landscape; and attractive to pollinators (lower left) at Scottsdale, AZ in 2016-17.

Conclusion

Before the first mowing in early July, all plant species that germinated and established a stand exhibited good quality and vigor. All of the native grasses performed at varying and acceptable levels to establish and provide surface area coverage throughout spring to the late summer. Overall observations showed that kurapia was very aggressive and vigorous as a groundcover. Kurapia, plains lovegrass, alkali sacaton, alkali muhly, and blue grama, in that order, performed well during the fall and into winter. Desert zinnia seed did not germinate in the laboratory or in the field.

Acknowledgements

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