

Groundcover Response to Limited Irrigation

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This study of 17 groundcover plant materials and one turfgrass managed as an unmowed groundcover is designed to evaluate their adaptation to the inland valley climate of Southern California and their performance at a reduced level of irrigation (see table). The plants represent a mix of native, so-called California-Friendly, and non-native as well as woody and herbaceous plant materials. Replicated field plots were planted in late 2009 through early 2010 and have been challenged with irrigation of 60% of real-time reference evapotranspiration (ET_o) since mid-May 2011.

The study objectives are to: (1) substantially expand the knowledge of groundcover water requirements; (2) evaluate the adaptation and performance of 17 groundcover and one turfgrass species in the inland valley climate when receiving water equal to or less than the amount needed by warm-season grass; and (3) evaluate the relative carbon fixation potential and water use efficiency among the plant species.

We are measuring plant response to irrigation by recording plant quality ratings of each species following established and accepted protocol. Plant quality of each plot is rated at least monthly on a scale of 1 to 9, with 9 = optimum/best plant quality and 1 = dead/worst plant quality. To estimate carbon fixation and water use efficiency of selected plant materials, a LI-COR 7500 open path infrared carbon dioxide and water analyzer will be used to measure carbon flux and evapotranspiration (ET) within each plot on a bi-weekly basis May 2011 to June 2012.

Study Design

- 18 species
- 1 irrigation treatment; 3 replications of each species
- 54 sub-plots 10 ft. × 10 ft. each
- Sprinkler irrigation
- Plants transplanted from containers or from flats as rooted cuttings 2009-2010
- No soil amendments
- Plots fertilized twice during establishment at 1 lb. N per 1000 ft.² per application
- Weeds managed with pre-emergent herbicides (oxadiazon and/or pendimethalin) and limited hand weeding

GROUNDCOVER RESPONSE TO LIMITED IRRIGATION STUDY – U.C. RIVERSIDE

Plot Map

NORTH



-----ROAD-----

Lonicera Japonica	Sedum mix	Mesembryanth. ?	Convolvulus sabatius	Buchloe dactyloides	Thymus pradox articus
Rosmarinus officianalis	Lantana montevidensis	Geranium X cantabrigiense	Geranium X cantabrigiense	Aptenia cordifolia	Atriplex cinerea
—	Hypericum caycinum	Corethrogyne flaginifolia	Juniperus horizontalis	Correa X unk.	Trachelospermum jasminoides
Atriplex cinerea	Corethrogyne flaginifolia	Lantana montevidensis	Geranium X cantabrigiense	Aptenia cordifolia	Sedum mix
Geranium X cantabrigiense	Trachelospermum jasminoides	Correa X unk.	Mesembryanth. ?	Lonicera japonica	—
Thymus pradox articus	Buchloe dactyloides	Hypericum caycinum	Juniperus horizontalis	Convolvulus sabatius	Rosmarinus officianalis
Corethrogyne flaginifolia	Rosmarinus officianalis	Thymus pradox articus	Atriplex cinerea	Aptenia cordifolia	Juniperus horizontalis
Buchloe dactyloides	Sedum mix	—	Hypericum caycinum	Correa X unk.	Mesembryanth. ?
Lantana montevidensis	Convolvulus sabatius	Trachelospermum jasminoides	Lonicera japonica	Geranium X cantabrigiense	Geranium X cantabrigiense

-----TURF PLOT-----

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Specific Epithet	Common Name	Source Size^z	Date Planted	Notes
1. <i>Drosanthemum speciosum</i> , <i>Delosperma</i> , <i>Mesembryanthemum</i> ??	vygie, iceplant	Altman Plants #1 container	4-2-10	Newer iceplant introduction, spring flowering, re-flowers in summer, So. Africa native, (vygie is Afrikaans term for <i>Mesembryanthemums</i> , fam. Aizoaceae)
2. <i>Rosmarinus officianalis</i> 'Irene'	prostrate rosemary	Native Sons 4-in. pot	11-4-09	Reported to be very low-growing
3. <i>Convolvulus sabatius</i> (<i>Convolvulus sabatius</i> ssp. <i>mauritanicus</i>)	ground morning glory	Native Sons 4-in. pot	11-4-09 repltd 4-2-10	Reported to be drought resistant, 1-2 ft. H x 2-3 ft. W, lavender flowers, Italy-Yugos-No. Af. native, hardy to 25°F
5. <i>Thymus praecox arcticus</i> (T. <i>praecox</i> subsp. <i>Arcticus</i> ; T. <i>serpyllum</i>) 'Pink Chintz'	creeping thyme	Native Sons 4-in. pot	11-4-09	Reported to grow 1-in. ht., pink flowers, attracts bees
6. <i>Atriplex cinerea</i> Poir.	coast or grey saltbush	Native Sons #1 container	11-4-09	Silver foliage, low-spreading, dioecious, Australian native
7. <i>Correa</i> X unk. 'Dusky Bells' ('Carmine Bells')	Australian fuchsia	Native Sons #1 container	11-4-09	Reported to be low wide-spreading, deep red flowers, Australian native
8. <i>Geranium</i> X <i>cantabrigiense</i> 'Biokova'	cranesbill	Native Sons #1 container	11-4-09	Reported very low and spreading, flowers winter-spring
9. <i>Juniperus horizontalis</i> 'Wiltonii'	blue rug juniper	Monrovia #1 container	12-2-09	Very flat dense growing, trailing branches, silver blue foliage
10. <i>Hypericum calycinum</i> L.	creeping St. Johnswort, Aaron's beard	Expertise Growers cuttings in flats	10-29-09	Low-growing, widely adapted, flowers primarily in spring and periodically in summer
11. <i>Salvia sonomensis</i> 'Gracias' (<i>S. sonomensis</i> X <i>S. clevelandii</i>)	creeping sage	Las Palitas #1 container	9-11-09	California native, reported low growing, wide spreading, lavender-blue flowers, possibly a hybrid of <i>S. sonomensis</i> X <i>S. clevelandii</i> , flowers winter/spring
12. <i>Aptenia cordifolia</i> (L.f.) N.E. Br. 'Red Apple' (<i>A. cordifolia</i> X <i>A. haeckeliana</i> ?)	red apple	Expertise Growers cuttings in flats	10-29-09 add plt 4-2-10	Ice plant relative
13. <i>Lantana montevidensis</i>	trailing purple lantana	Expertise Growers cuttings in flats	10-29-09 add plt 4-8-10	Common landscape lantana, purple flowers spr.-summer
14. <i>Trachelospermum jasminoides</i>	star jasmine	Expertise Growers cuttings in flats	10-29-09	Vigorous once established, widely adapted
15. <i>Sedum</i> spp.	mixed sedums	Altman Plants 8 ft. x 8 ft. mats	3-31-10	Sod-like product with cuttings of 4 <i>sedum</i> spp. Rooted in jute mat under laden with plastic netting
16. <i>Buchloe dactyloides</i> 'U.C. Verde'	buffalograss	Todd Valley Farms plugs	4-8-09	Warm-season grass, a standard of performance under limited irrigation
17. <i>Corethrogyne filaginifolia</i> 'Silver Carpet'	California aster, common corethrogyne	Las Palitas #1 container	9-11-09	California native plant
18. <i>Lonicera japonica</i> 'Halliana'	Hall's honeysuckle, Japanese honeysuckle	Expertise Growers cuttings in flats	10-29-09	Very vigorous, reported to be tolerates drought well

^z Plants from flats and plugs spaced 1.0 ft. o.c., 64 plants/plot; plants from 4-in. and #1 pots spaced 2.0 ft. o.c., 16 plants/plot