Are We Drowning our Plants

August 5, 2008

Presenters:
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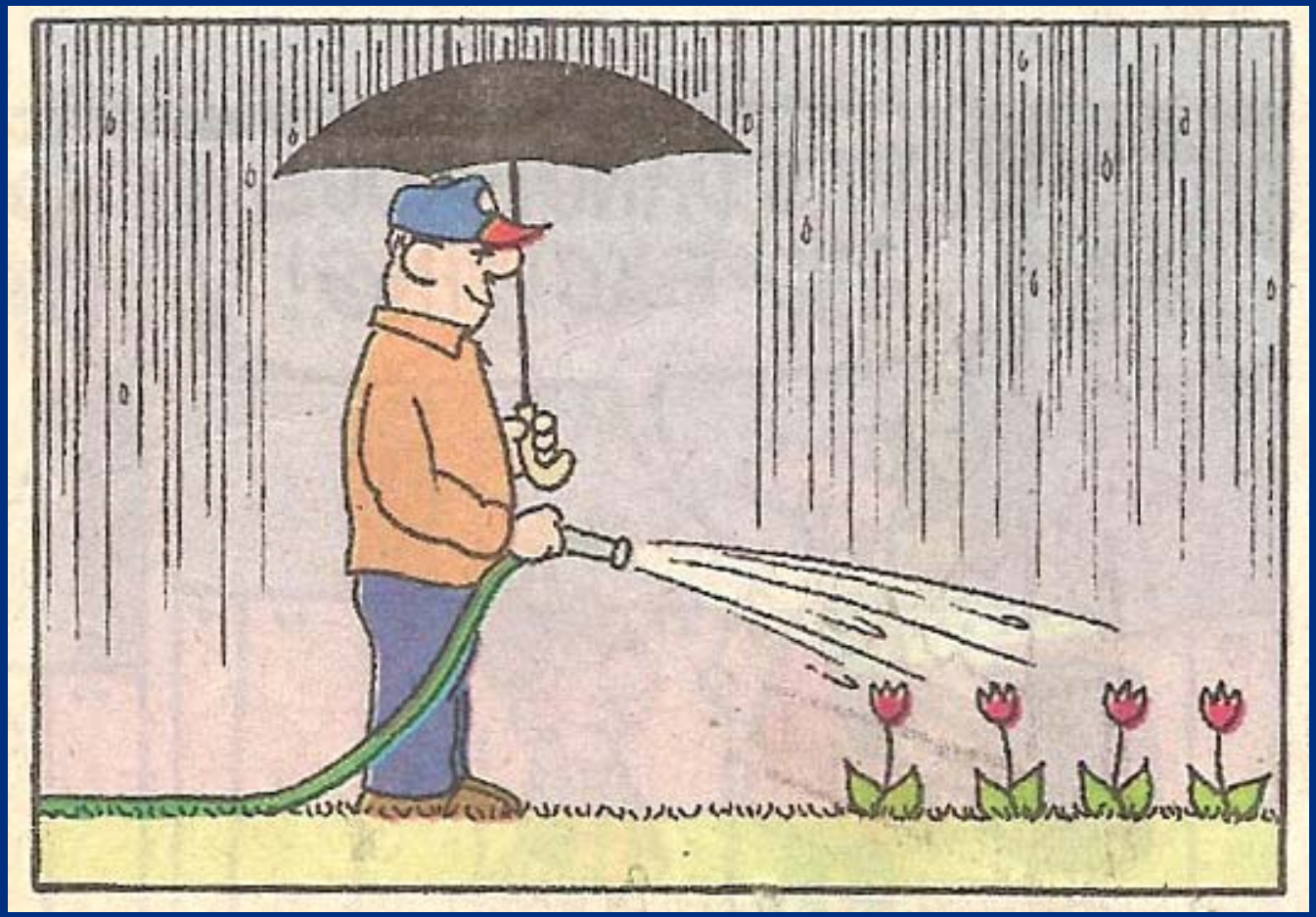

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YES!

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How are we drowning the plants?

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The most state of the art irrigation controllers, Eto based weather systems, devices and sensors will not compensate for inherent landscape deficiencies…

Turfgrass diseases and insects not diagnosed trigger the ‘more water’ syndrome

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Understand soil drainage characteristics

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- Roots begin to die after 3 hours in absence of air/oxygen
- After 2 days of saturation damage to the woody root tissue occurs
- After one week in wet soils, roots are damaged

Understand soil texture, water-holding capacity and infiltration

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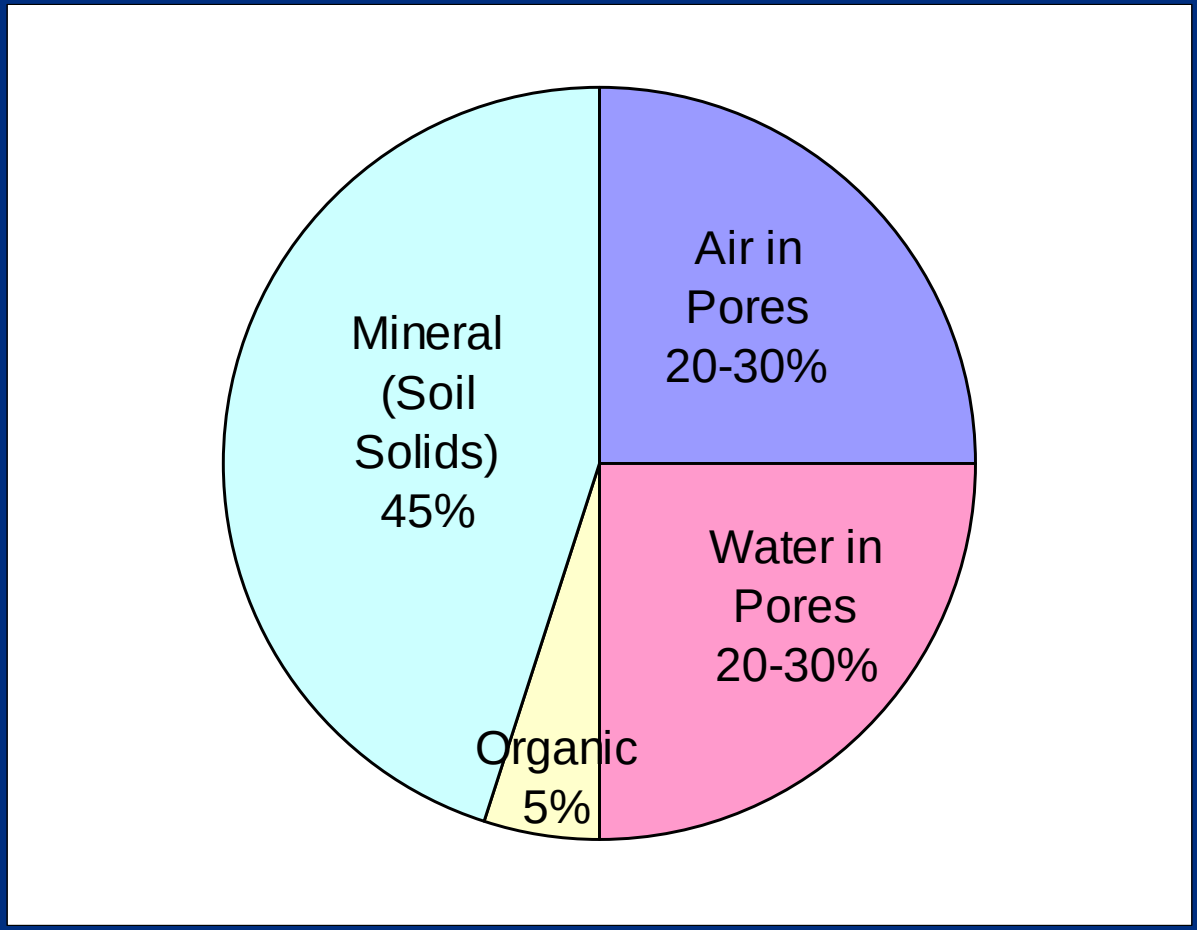
Soil Pie


Air in Pores 20-30%
Water in Pores 20-30%
Organic 5%
Mineral (Soil Solids) 45%

Soil Texture and Water-Holding Capacity

Soil Texture	**Storage**
	(inches water/4 inches soil depth)
Stones & gravel	0
Sand	0.12
Loamy sand	0.4
Sandy loam	0.6
Silt loam	0.8
Peat	1.0

Infiltration and movement

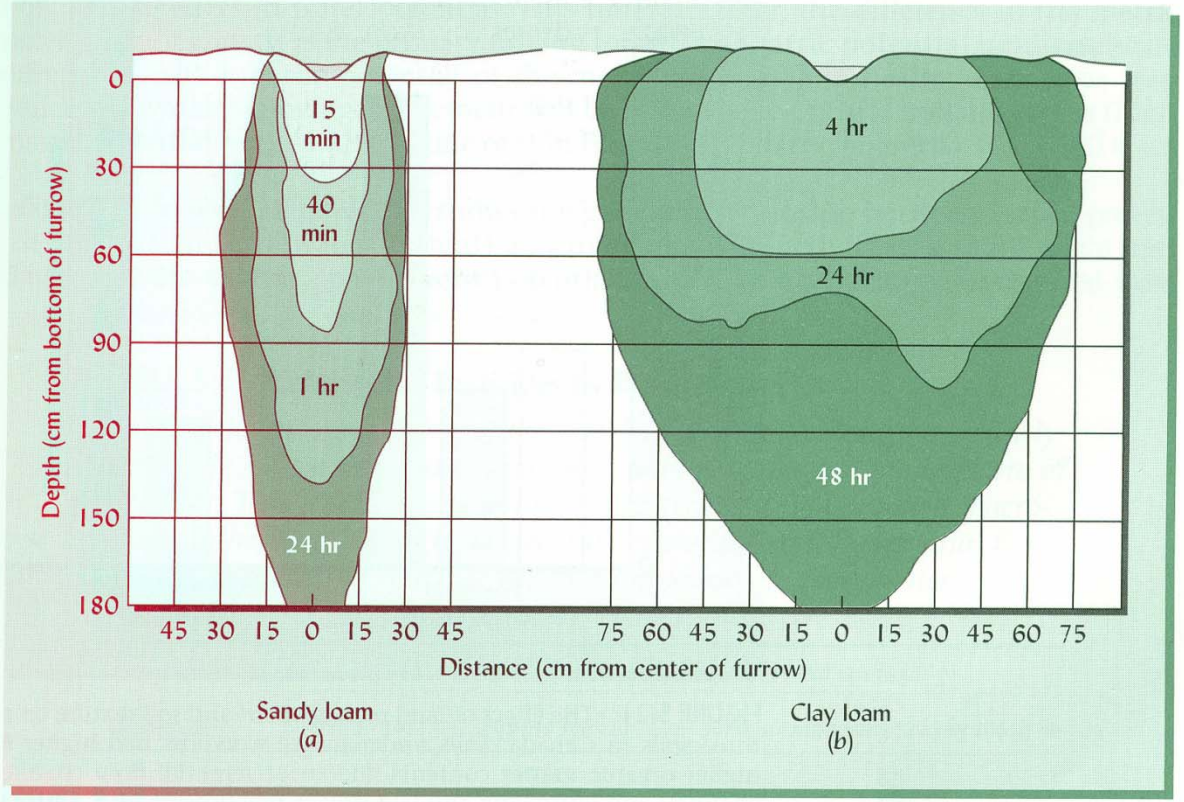
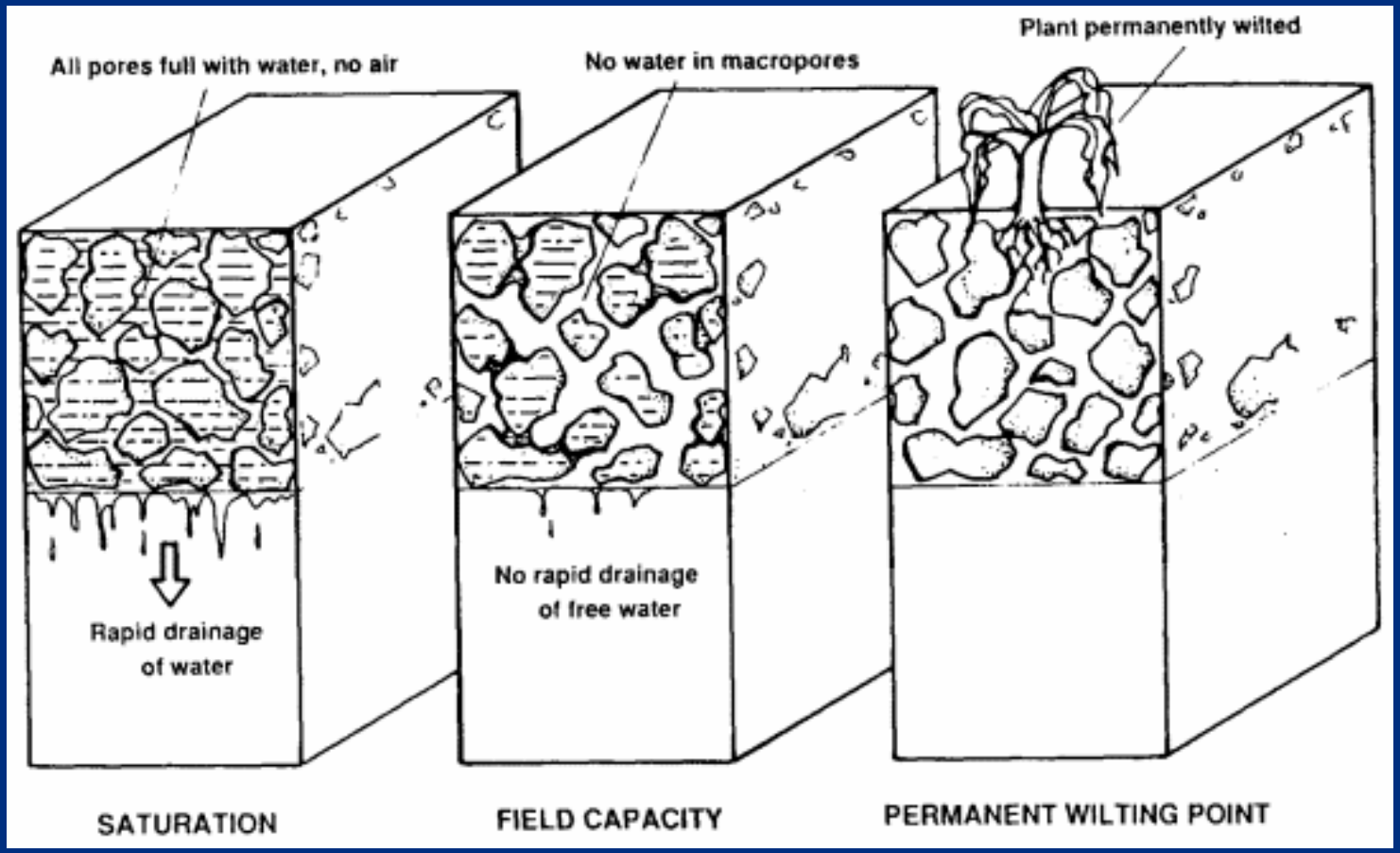


FIGURE 5.20 Comparative rates of irrigation water movement into a sandy loam and a clay loam. Note the much more rapid rate of movement in the sandy loam, especially in a downward direction. [Redrawn from Cooney and Peterson (1955)]

Water Holding Capacity



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Texture	Aeration/ Porosity	Infiltration	WHC
Loam	Medium	Medium	Medium
Clay	Poor	Poor	Good
Silt	Medium	Medium	Medium
Sand	Excellent	Good	Very Poor

How do we maintain our root zone at field capacity?

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Install soil moisture sensors, evapo-transpiration (Eto) or similar irrigation controllers, rain sensors, etc.

Understand the general characteristics of our root zone soil

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TOPSOIL QUALITY GUIDELINES for LANDSCAPING*

Category	pH	Soluble Salts dS/m or mmho/cm	Sodium Absorption Ratio (SAR)	Organic Matter %	Sand %	Silt %	Clay %	Texture Class
Ideal	5.5-7.5	<2	<3	≥2.0	<70	<70	<30	Loam (L), Silt Loam (SiL)
Acceptable	5.0-8.2	<4	3 to 7 SiL, SiCL, CL 3 to 10 SCL, SL, L	≥1.0	<70	<70	<30	Sandy Clay Loam (SCL) Sandy Loam (SL) Clay Loam (CL) Silty Clay Loam (SiCL)
Suspect	<5.0 >8.2	>4	>10	<1.0	≥70	≥70	≥30	Loamy Sand (LS) Sandy Clay (SC) Silty Clay (SiC) Sand (S), Silt (S), Clay (C)

•from "Topsoil Quality Guidelines for Landscaping", June 2002, AG/SO-02,
• prepared by Rich Koenig, Utah State University Cooperative Extension Soil Specialist, and Von Isaman, QA Consulting and Testing, LLC.

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Control subsoil and topsoil during construction and installation of the landscape

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Soil Layers and Compaction

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Subsurface Roots

Subsoil not Scarified

Engineered Soil Layers

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Soil Mosaic

Understand the relationship between turfgrass height and rooting depth

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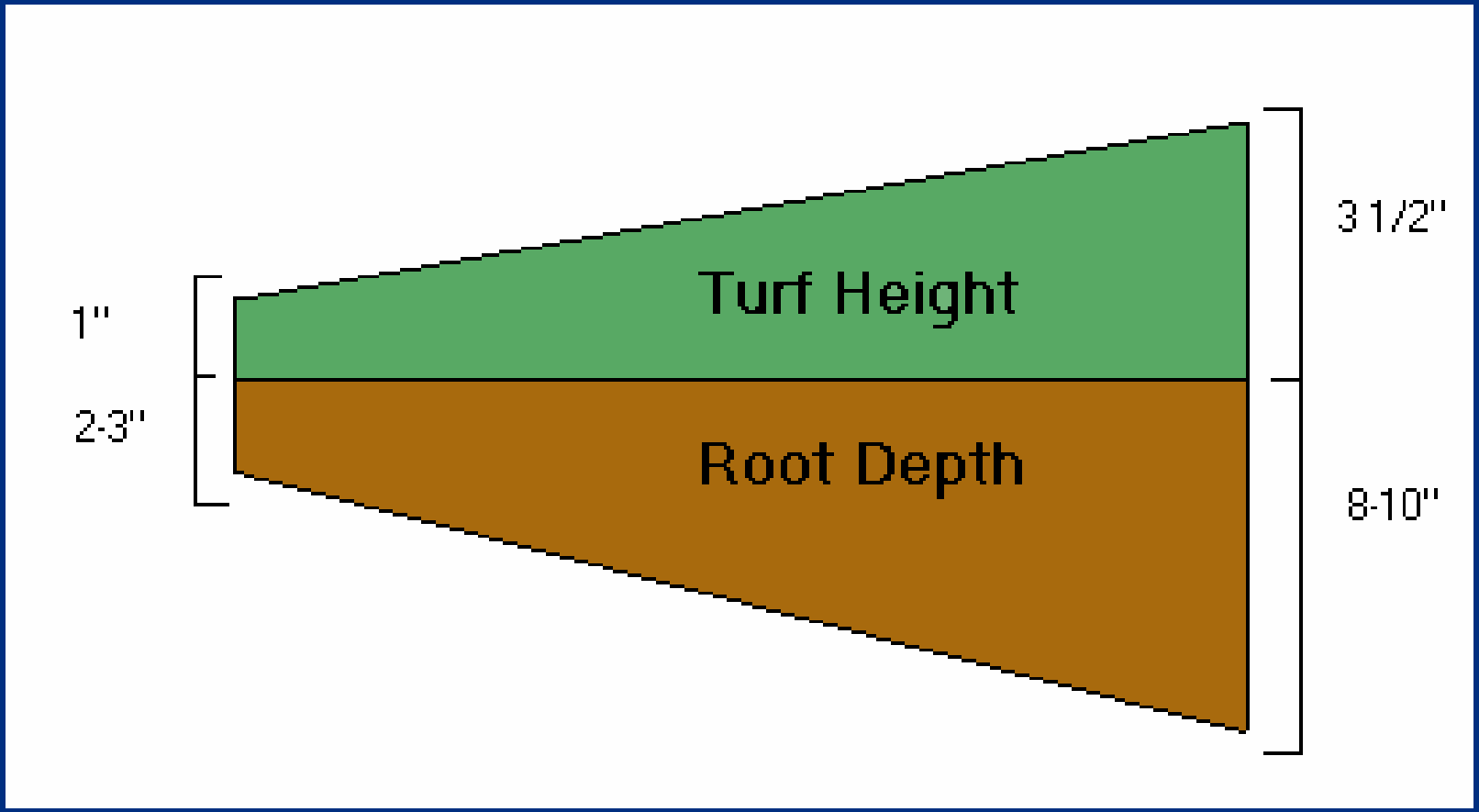
Turf Height/Root Depth



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Monitor our irrigation controller – Do you ‘set’ and ‘forget’?

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Tamerisk Seedling

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Slugs in Bulbs

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Leaf margins and tips brown on young plants (<5 years old)

- too dry
- too wet
- compacted soil
- salinity

Chlorosis/Yellow Leaf Color

- too wet
- compacted soil

Poor leaf color, size, weak, reduced growth, gradual die back of branches

- too wet
- too dry
- soil compaction
- salinity

Plants Suddenly Dying

- too wet
- too dry

Keep the irrigation system tuned…

Mismatched Heads

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Distribution uniformity

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Hydrozoning: ‘same/same’ not ‘same/different’

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Juniper and Honeylocust

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Juniper, Cotoneaster, Mugo Pine

Viburnum, Juniper, Euonymous, Cedar

Turf & shrub on same zone

Field Monitoring

Screwdriver Test

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Ordinance/Regulation

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Innovative Community Waterwise Ordinance in West Jordan City

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West Jordan City Municipal Code
Title 89, Chapter 6
PART 7 (Landscaping)

Components

- Auditor
  - person who affirms compliance with PART 7
- Irrigation/landscape plan review
- Irrigation mid-construction inspection
- Final landscape irrigation audit

Irrigation/Landscape plan review

Checklists

- Municipal code PART 7 (7 pages)
- UIA-Utah Irrigation Association (10 pages)
  - Minimum Standards for Efficient Irrigation System Design and Installation (Version 2002)

PART 7 requires compliance to the UIA minimum standards

General Requirements in the **Municipal** Code

- Turf/non-turf areas on separate valves
- Hydrozoning
- Irrigation devices on separate valves (sprays, rotors, drip bubblers, etc.)
- Separate water meter for landscape

General Requirements in the Municipal Code (cont.)

- 80% of trees and shrubs from “Water-wise Plants for Salt Lake City.”
- 80% of herbaceous perennial and groundcover plants from “Water-wise Plants for Salt Lake City.”

List of Water-wise Plants for Salt Lake City

Amended April 2004

WATER ZONE	BOTANICAL NAME	COMMON NAME	MATURE SIZE H X W	AREA VALUE (SQ FT)	LIGHT	COMMENTS
VINES & GROUND COVERS						
0	Juniperus communis	Common Juniper	2-4' x 4-6'	20-28'	Full sun to light shade	Evergreen. Low growing junipers; color and texture vary with cultivar.
0	Mahonia repens	Creeping Oregon Grape	2' x 6'	28'	Part to full shade	Evergreen. Utah native. Dry shade.
1	Alyssum montanum	Mountain Gold Alyssum	4" x 15"	1'	Sun to part shade	Bright yellow flowers in early spring cover gray green foliage.
1	Anacyclus depressus	Mount Atlas Daisy	2" x 18"	1.75'	Full sun	Silvery green foliage; bright white daisy-like flower mid spring

General requirements in the **UIA** minimum standards

- Spray heads 60% DU
- Rotors 70% DU
- Pressure regulation devices
- Hydrozoning and slopes

Conclusion

- So goes the water, so goes the roots
- So goes the roots, so goes the plant

Have a good day. Thanks!

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For More Information

- Would you like to know more about this session?
- Von Isaman
- QA Consulting and Testing, LLC
- Po Box 627 Salem, UT 84653
- vonisaman@comcast.net

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