

Water Conservation for Urban Lawns Using Non- Potable Irrigation Water

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Water War Enters New Stage

San Juan-Chama Project and the



Headwaters
San Juan-Chama Project and the
Corps League El Perro Diablo detachment, including Jesse Rodriguez, left, stand at attention at Veterans Park during commemorating Victory over Japan Day. The featured speakers were Pearl Harbor survivor Stanley Kotovsky and university Army ROTC professor Lt. Col. Frank Sherman.

Sun-News photo by Vladimir Chulopka

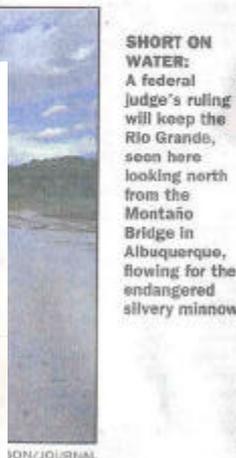
Chairman Gilbert Apocaca wanted to move Pecos Hills to Garza's district. Because Garza is a Democrat, and Pecos Hills is heavily Republican, Garza suggested such a change would hurt his chances for re-election in 2002. Garza will be the only commissioner running for re-election next year.

Apocaca did not respond to Garza's accusations during the questioning of Sharp, but earlier in the meeting he said he had no input into the proposed plans.

Sharp said his company did meet with a commissioner. But when Garza asked Sharp to reveal the name of the commissioner, Sharp declined to answer, citing confidentiality rules. Garza did not pursue the question any further.

He asked Sharp if he was aware that when Research and Polling Inc. entered its contract with the county, the firm presented a time line for meeting with all the commissioners to get input into the

See Politics/1, Page A-7



SHORT ON WATER:
A federal judge's ruling will keep the Rio Grande, seen here looking north from the Montano Bridge in Albuquerque, flowing for the endangered silvery minnow.

SON/JOURNAL

How Bad Is The Drought

Craig Runyan
Water Quality Coordinator

Areas throughout the country are experiencing drought conditions. The situation is particularly disturbing to residents east of the Mississippi, where drought is generally not considered a threat. Some state and local



New Mexico State University is an equal opportunity institution. NMSU and the U.S. Dept.

Officials grapple with limited water

By Christopher Schurtz
Sun-News

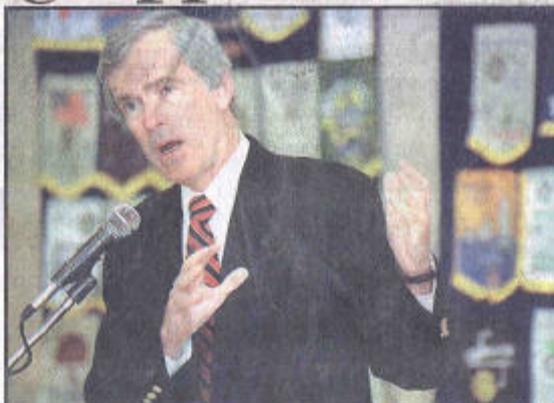
Debated and fought over for decades, the complex issues surrounding water rights in the Texas, New Mexico and Mexico region are far from being resolved.

And the rapid population growth of the region will likely exacerbate tensions over water rights in the coming years if a more coordinated effort at settlement is not made.

This is one sentiment agreed on by a panel of area water experts Tuesday during a hearing of the Senate Energy and Natural Resources Committee at New Mexico State University, hosted by committee chairman Sen. Jeff Bingaman, D-N.M.

Bingaman said the population of the region, according to the most recent census figures, has grown at a rate exceeding other areas of the country.

Combined with an already scarce supply of clean, available water in most areas in the region, he said, the increased demand that will come with the population boom will further strain the water supply.



Sun-News photo by Vladimir Chulopka

Sen. Jeff Bingaman, D-N.M., speaks before members of the Mesilla Valley Economic Alliance and the Rotary Club on Tuesday at the Mesilla Valley Best Western Inn.

Bingaman says alternative fuels, research needed

By Christopher Schurtz
Sun-News

Sen. Jeff Bingaman, D-N.M., criticized several energy policy decisions made by President George W. Bush, saying more must be done in pursuing "enlightened policies" concerning energy production and conservation.

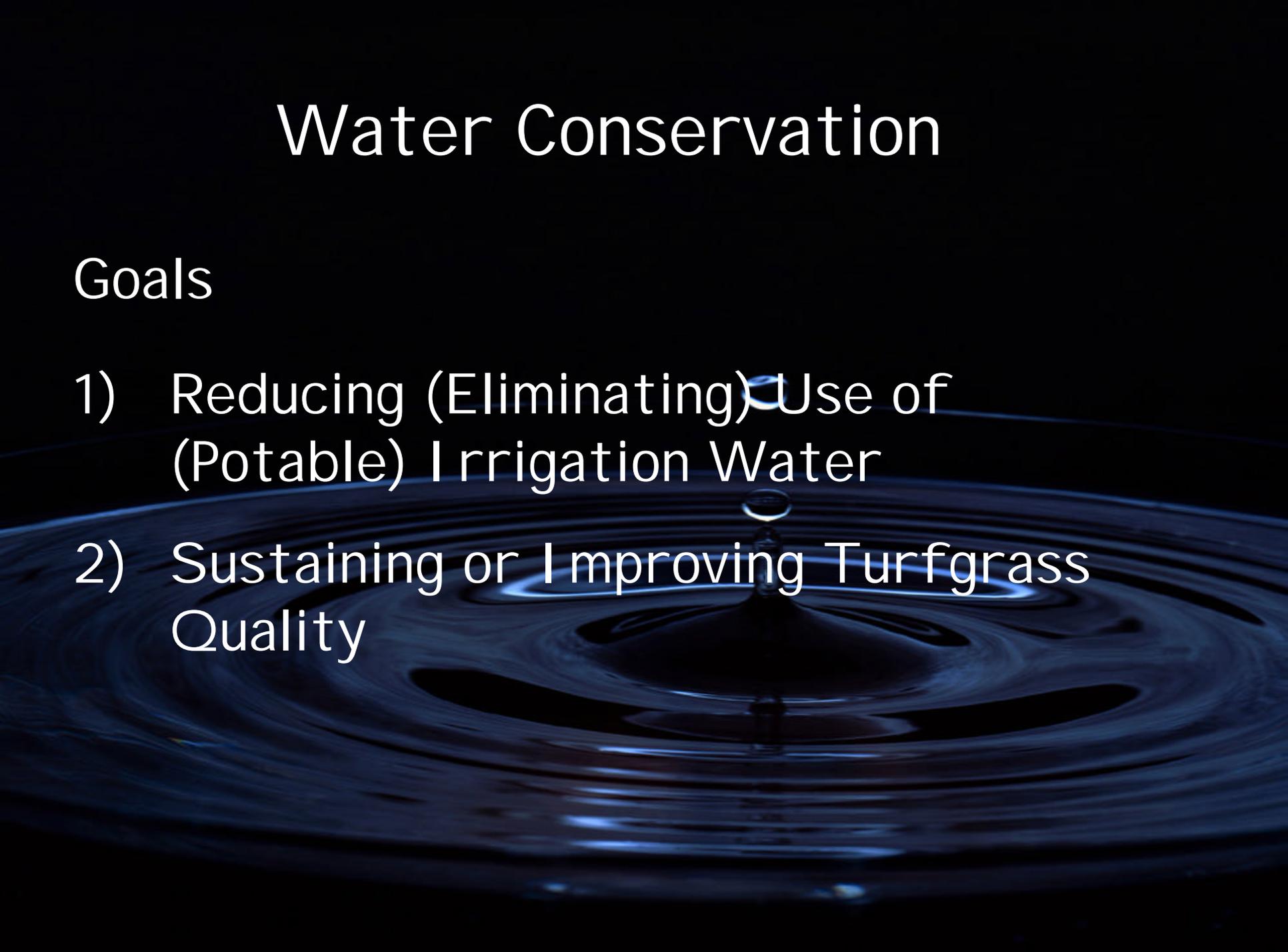
In town Tuesday to host a hearing of the committee concerning water issues, Bingaman spoke of his energy plan to a packed room before area political and social leaders and members of the Mesilla Valley Economic Alliance and the Rotary Club.

The chairman of the U.S. Senate Committee on Energy and Natural Resources, Bingaman said he disagrees with the Bush administration's proposals to drill for oil in the Alaskan National Wildlife Refuge Alaska.

opardy

Water Conservation

Goals

- 1) Reducing (Eliminating) Use of (Potable) Irrigation Water
 - 2) Sustaining or Improving Turfgrass Quality
- 
- The background of the slide features a close-up, high-speed photograph of a single water droplet hitting a dark surface, creating a series of concentric, shimmering ripples that spread outwards. The lighting is dramatic, highlighting the texture of the water and the central point of impact.

NON-POTABLE WATER FOR TURF IRRIGATION

1. Effluent Water

- ✓ discharge from treatment plants
- ✓ grey water

2. Groundwater

- ✓ Saline shallow aquifer

3. Surface Water

- ✓ Brackish water
- ✓ Sea water

4. RO concentrate

NON-POTABLE WATER FOR TURF IRRIGATION

1. Salt content
2. Sodium hazard
3. Total suspended solids
4. Bicarbonate content
5. Toxic Ion Content
6. Water pH
7. Bacteria/virus eradication





AI

SAR (Sodium Adsorption Ratio)

Relative threat from water source to ruin soil structure when there is MORE sodium than calcium and magnesium in the water source.

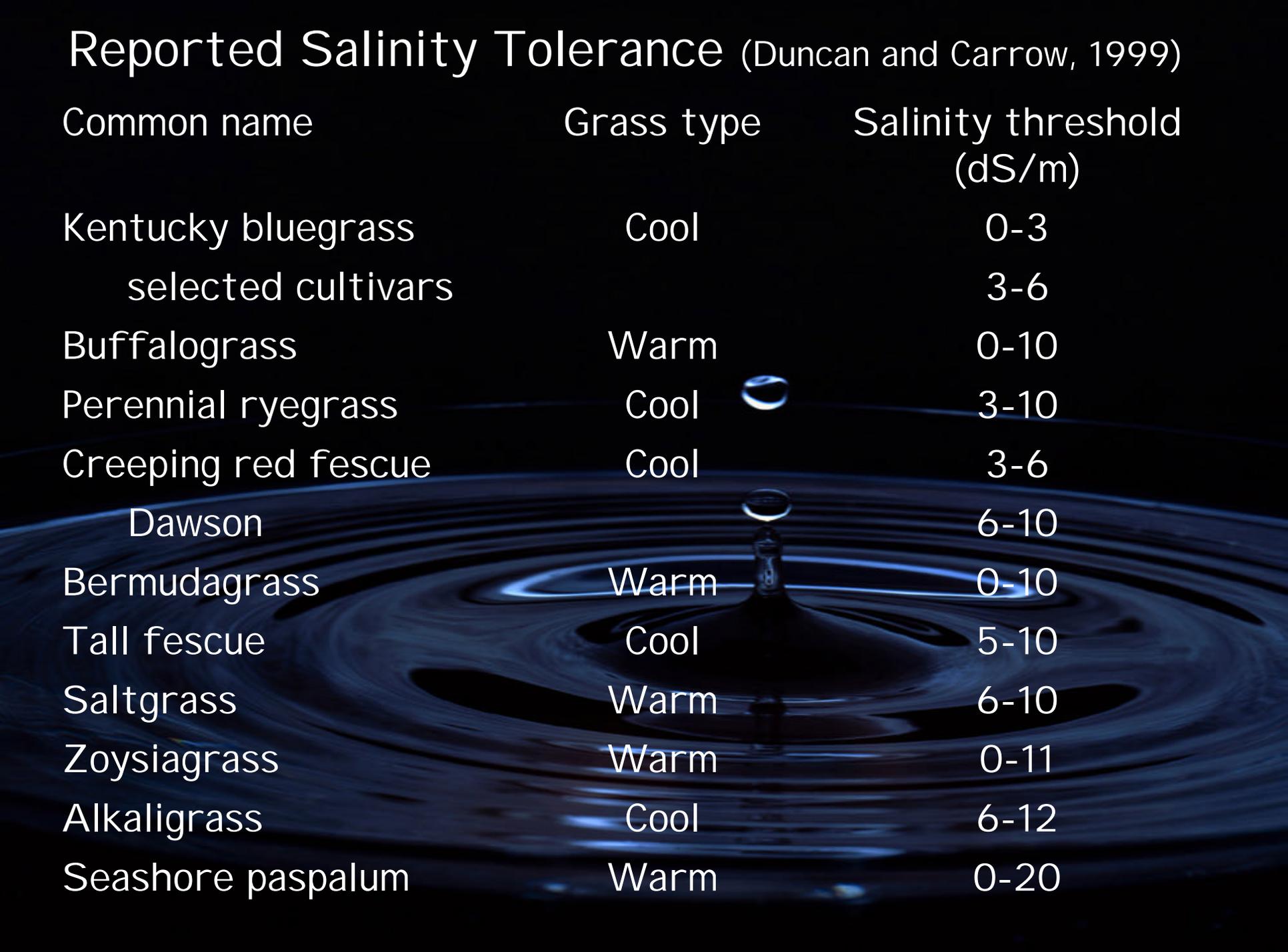
Recommended gypsum amount on WQTR is based on the SAR of the water source.



IRRIGATION CONSIDERATIONS

- ✓ High(er) precipitation rate
- ✓ Pipe I.D.
- ✓ Filtration
- ✓ Pressure control
- ✓ Access limits / use restrictions

Reported Salinity Tolerance (Duncan and Carrow, 1999)



Common name	Grass type	Salinity threshold (dS/m)
Kentucky bluegrass	Cool	0-3
selected cultivars		3-6
Buffalograss	Warm	0-10
Perennial ryegrass	Cool	3-10
Creeping red fescue	Cool	3-6
Dawson		6-10
Bermudagrass	Warm	0-10
Tall fescue	Cool	5-10
Saltgrass	Warm	6-10
Zoysiagrass	Warm	0-11
Alkaligrass	Cool	6-12
Seashore paspalum	Warm	0-20

New (alternative) turfgrasses

Poa compressa

Koeleria macrantha

Festuca longifolia

Festuca ovina

Poa arachnifera x *Poa
pratensis*

Deschampsia cespitosa

Puccinella distans

Cynodon dactylon

Zoysia japonica

Paspalum vaginatum

Distichlis spicata

Buffalo dactyloides

Bouteloua gracilis

Research Objectives

1. Study effects of three salinity levels on establishment using sprinkler or sub-surface irrigation
2. Study salinity effects on winter survival and determine if Las Cruces (zone 8a) has a sufficient growing season to establish cool and warm-season turf with saline water
3. Study long-term effects of water quality and irrigation type on turf quality

Project Description

- ✓ 21 grasses
- ✓ 2 irrigation systems
- ✓ 3 salinity levels
- ✓ CRSBD



Grasses

Cool Season

- ✓ Hybrid Texas bluegrass
 - 'Thermal Blue' a.k.a. HB129
 - 'SRX2TK95'
- ✓ Tall Fescue
 - 'Southeast'
 - 'Tar Heel II'
- ✓ Perennial Ryegrass
 - 'Brightstar SLT'
 - 'Catalina'
- ✓ Alkaligrass
 - 'Salty'
 - 'Fults'
- ✓ Fine Fescue
 - 'Dawson'

Warm Season

- ✓ Bermudagrass
 - 'Sahara'
 - 'Princess'
 - 'Riviera'
 - 'Transcontinental'
- ✓ Zoysiagrass
 - 'De Anza'
 - 'Companion'
- ✓ Buffalograss
 - 'UC Verde'
 - 'SW2000'
- ✓ Saltgrass
 - 'DT16'
 - 'A138'
- ✓ Seashore paspalum
 - 'Seaspray'
 - 'Seadwarf'

Subsurface Irrigation System

- ✓ Precision Porous Pipe – pipe delivers water directly to root zone, avoiding exposure to dry desert air and wind
- ✓ Low pressure system (20-25 psi) operating as low as 3 gpm



Sprinkler System

- ✓ Walla Walla – low output MP Rotator sprinklers spray streams of water, reducing evaporative loss



Water Quality

✓ Saline

- EC = 3.1–5.0 dS m⁻¹
- SAR = 10.5
- Total Dissolved Solids = 2050–3220

✓ Potable

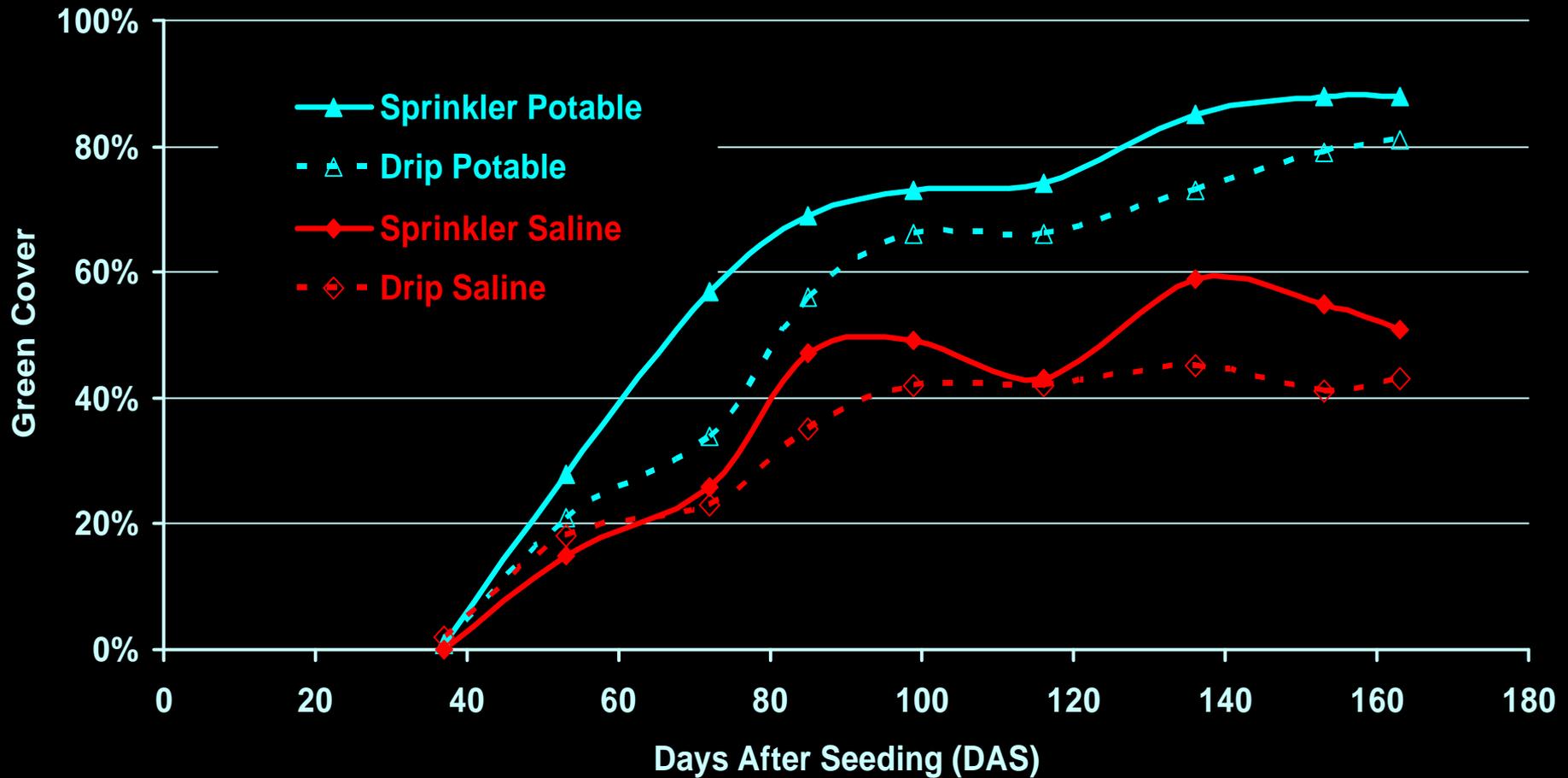
- EC = 0.6–1.2 dS m⁻¹
- SAR = 1.61
- Total Dissolved Solids = 413–750

Results

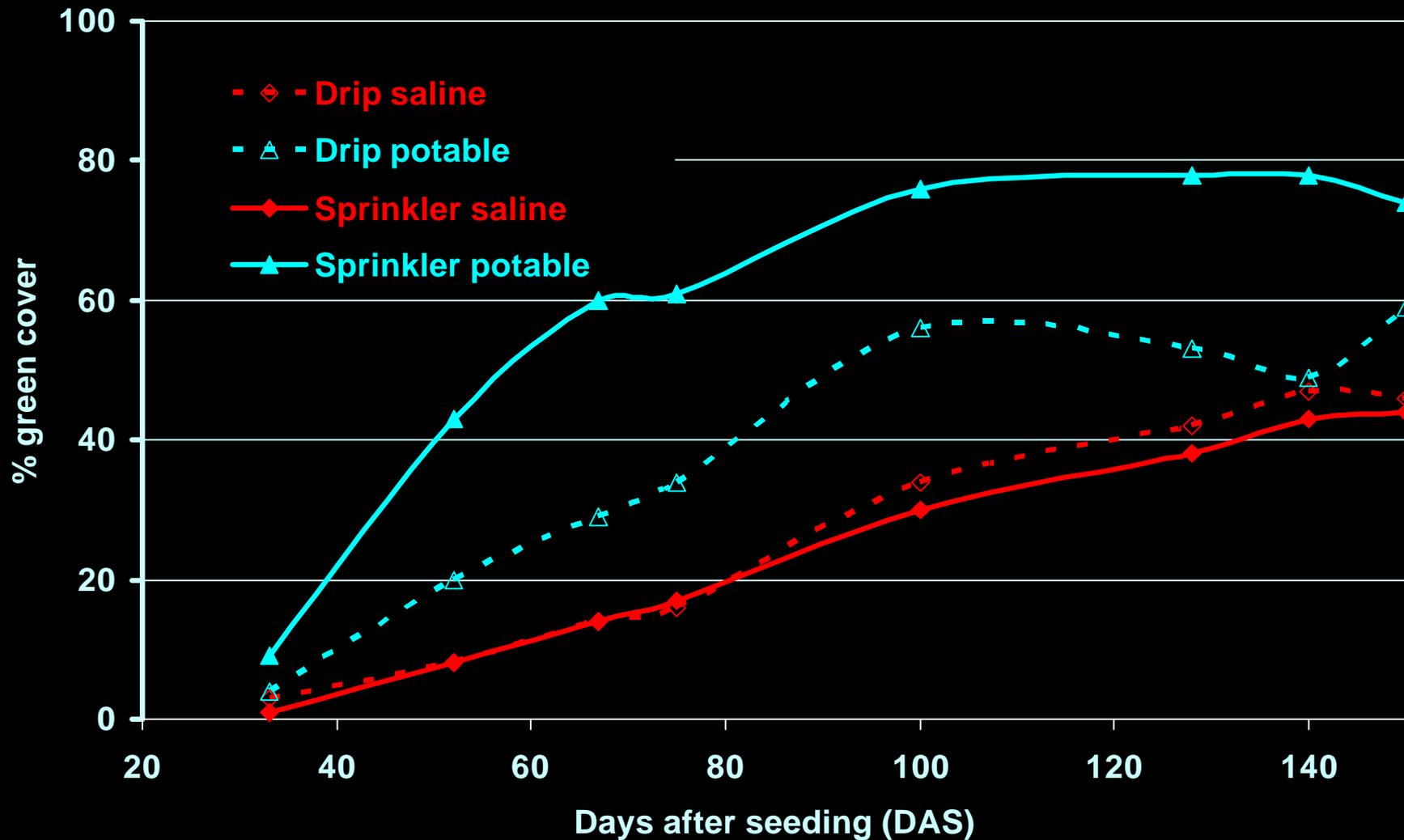


Subsurface or Sprinkler?

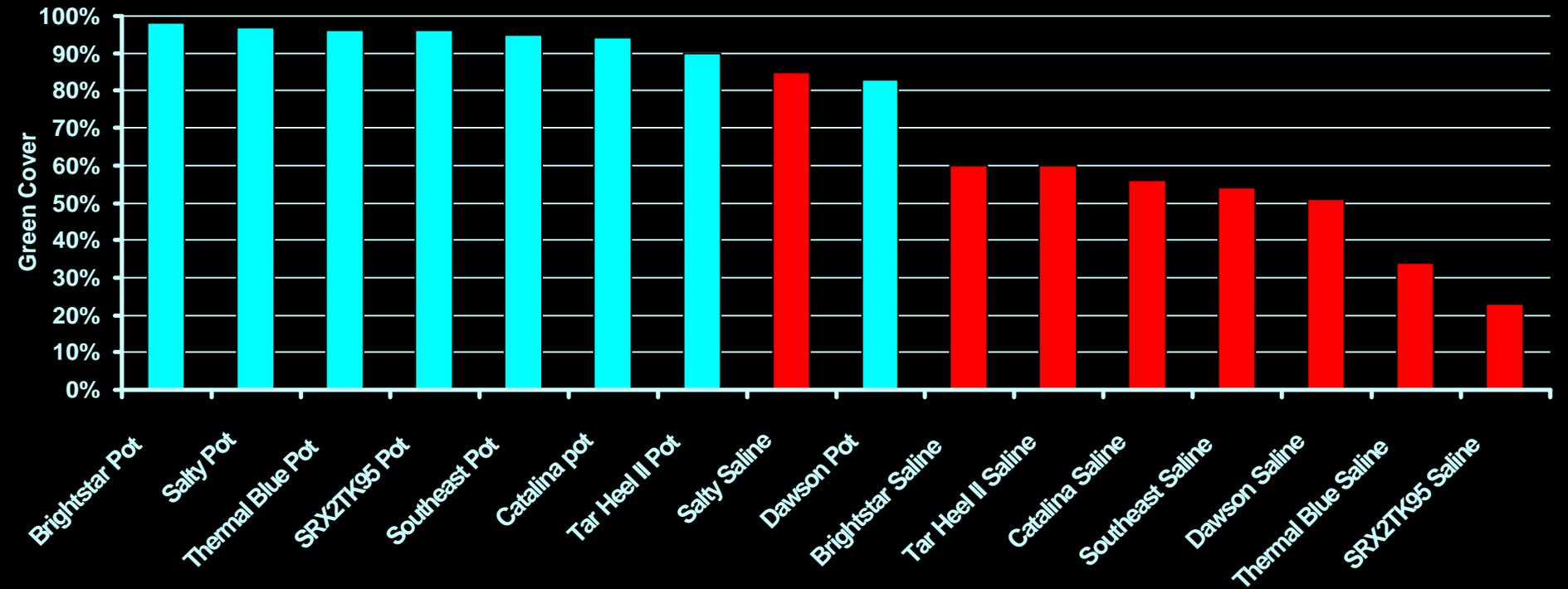
Establishment Cool Season Grasses



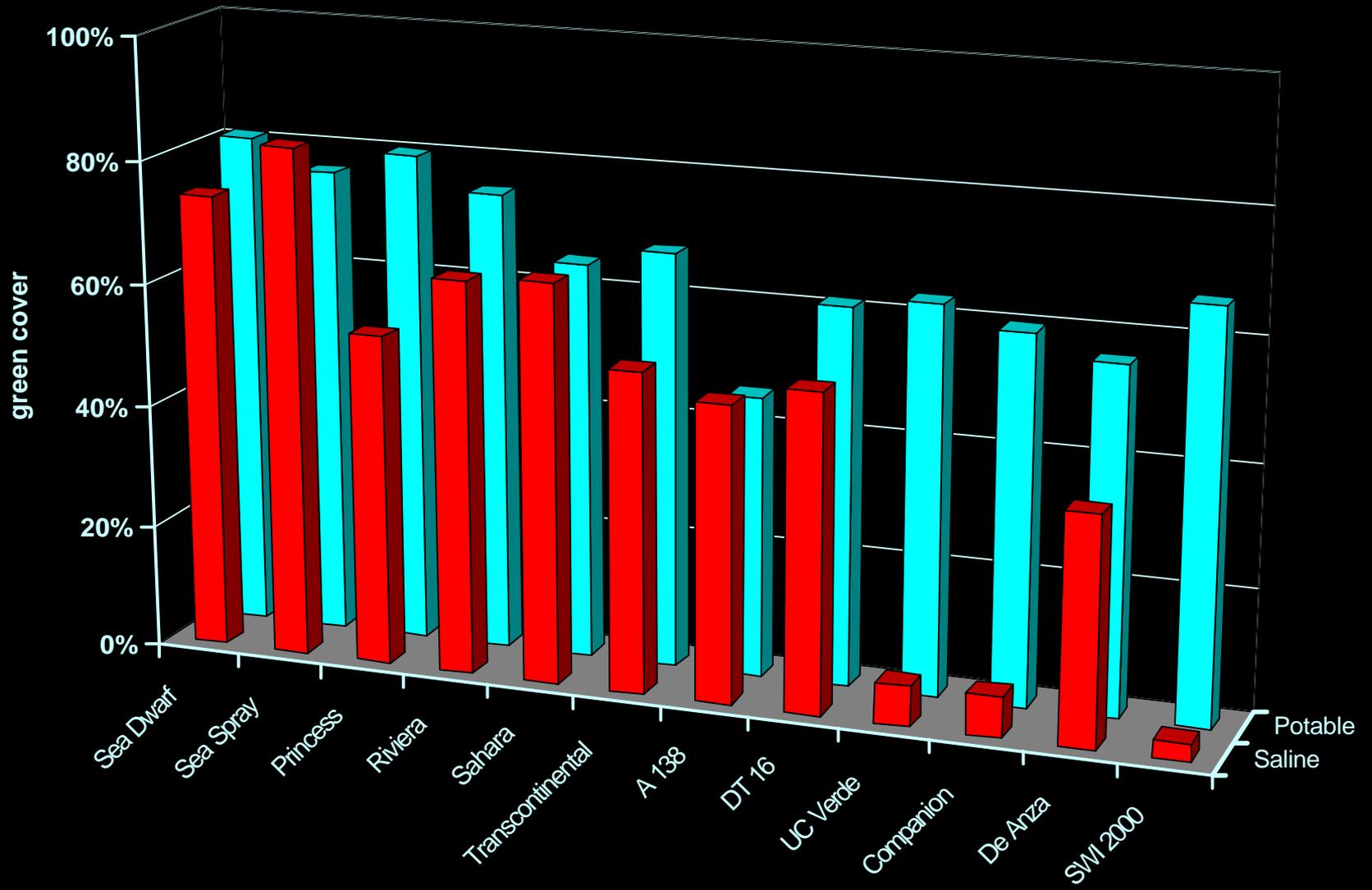
Establishment Warm Season Grasses



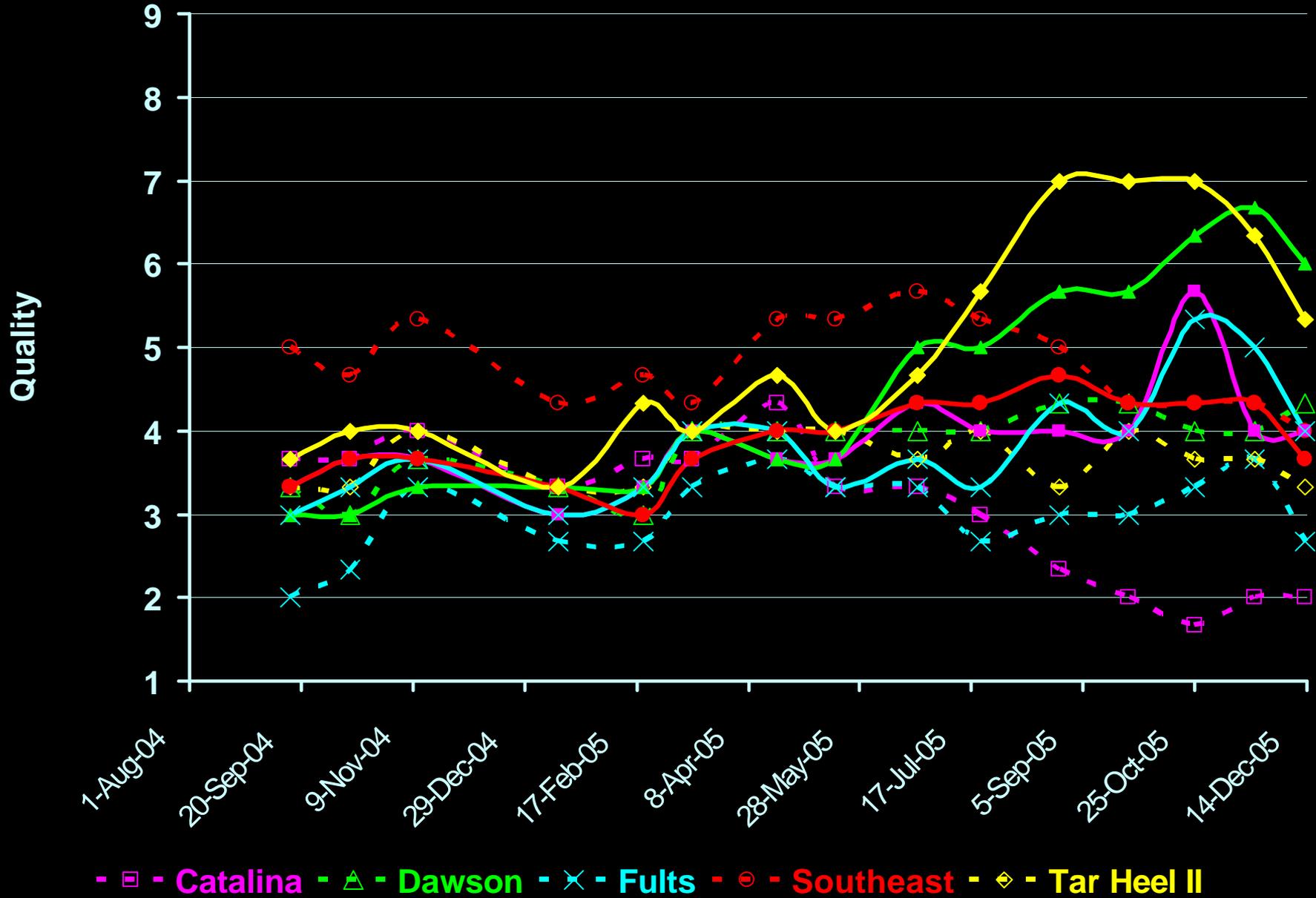
Establishment Cool Season Grasses 160 DAS



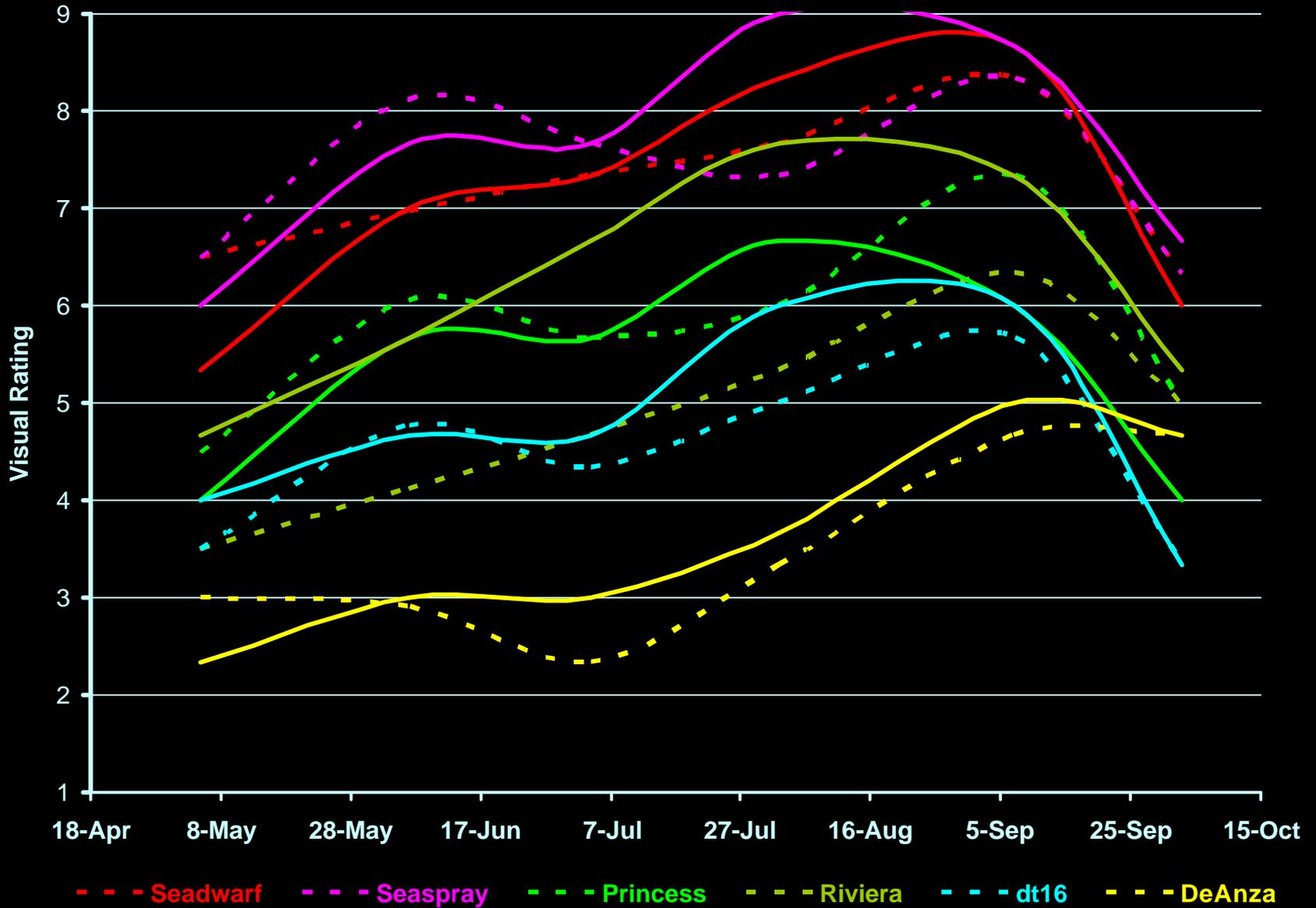
Establishment Warm Season Grasses 150 DAS



Cool season quality when irrigated with saline water



Warm season quality when irrigated with saline water

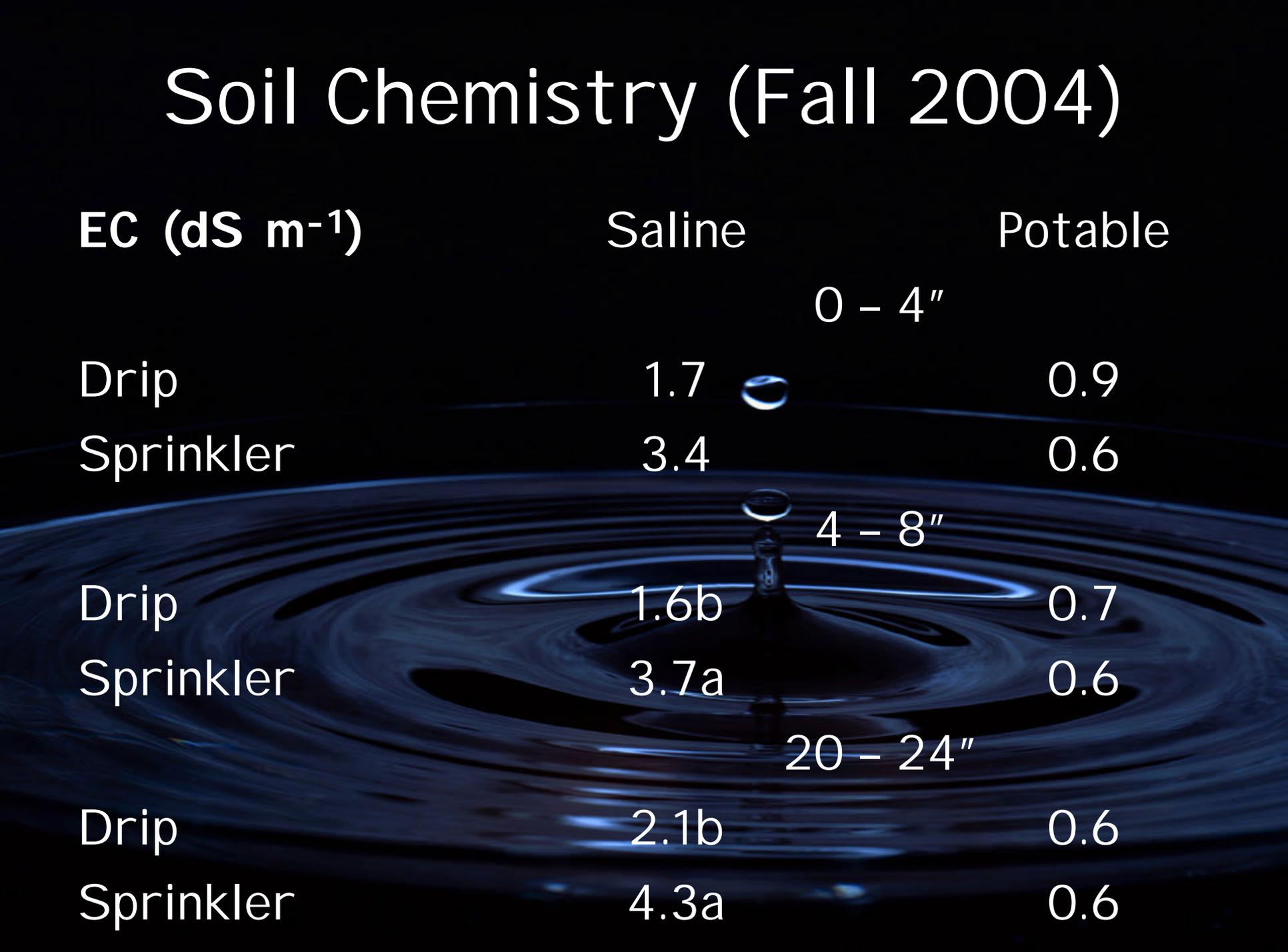


Sprinkler Cool Season
February 2006



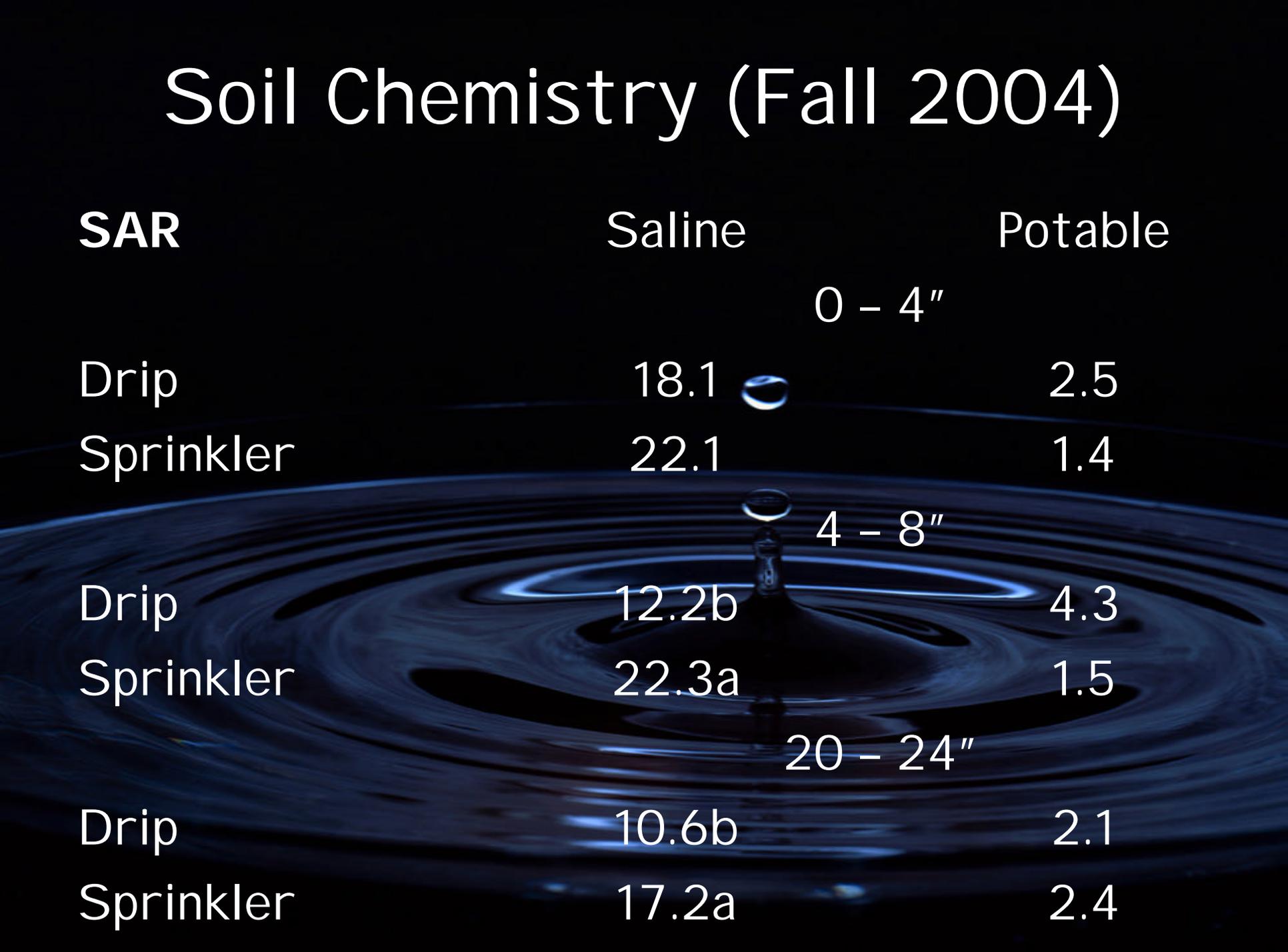
Drip Warm Season February 2005

Soil Chemistry (Fall 2004)



EC (dS m ⁻¹)	Saline	Potable
		0 – 4"
Drip	1.7	0.9
Sprinkler	3.4	0.6
		4 – 8"
Drip	1.6b	0.7
Sprinkler	3.7a	0.6
		20 – 24"
Drip	2.1b	0.6
Sprinkler	4.3a	0.6

Soil Chemistry (Fall 2004)



SAR	Saline	Potable
		0 – 4"
Drip	18.1	2.5
Sprinkler	22.1	1.4
		4 – 8"
Drip	12.2b	4.3
Sprinkler	22.3a	1.5
		20 – 24"
Drip	10.6b	2.1
Sprinkler	17.2a	2.4

Summary (1)

Establishment

- ✓ Irrigation system had no effect when saline water was used
- ✓ Salinity greatly affects the establishment rate
- ✓ Sprinkler systems and potable water may be the easiest and most effective way to establish turf, but alternative combinations of water quality, irrigation methods, and species/cultivar selection are becoming increasingly important!

Summary (2)

- ✓ Sprinkler irrigation improved turf quality of cool season grasses in the summer
- ✓ Cool season Tall Fescue var. Tar Heel II and Fine Fescue var. Dawson showed acceptable quality when irrigated with sprinklers and saline water
- ✓ Seashore paspalum cvs. Seaspray and SeaDwarf performed best of all grasses under saline irrigation, regardless of irrigation type
- ✓ Salt tolerant cultivars of previously reported salt sensitive species show potential for use in critical climates
- ✓ After 2 years, subsurface drip showed no signs of decreased irrigation uniformity

Acknowledgements



- ✓ USDA (Rio Grande Initiative)
- ✓ NMSU
 - Office for Facilities and Services
 - Water Resources Research Institute
 - Golf Course

