# HALOPHYTIC TURFGRASS MAINTAINS QUALITY WHEN IRRIGATED WITH SALINE WATER

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## Background

Many towns in the Australian "wheat belt" have shallow saline groundwater. Can this saline water be used to irrigate turfgrass?

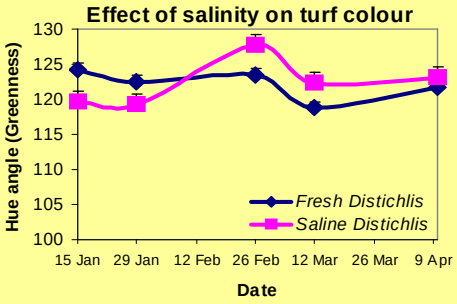
## Approach

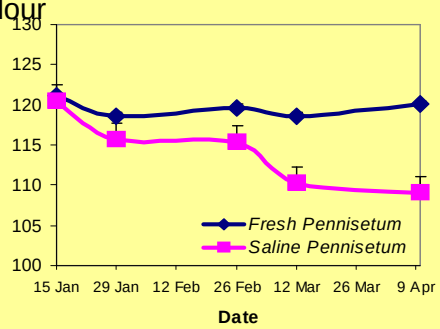
Study of salt and water dynamics in the root zone, and the comparative physiology of halophytic (*Distichlis spicata*, *Sporobolus virginicus* and *Paspalum vaginatum* vs. a non-halophytic turfgrass (*Pennisetum clandestinum*), for plots irrigated with fresh or saline water, under Mediterranean-type climate.

Salt accumulation in soil in the first year

1. Salinity of applied water was 13 dS $m^{-1}$ (1/3$^{rd}$ of sea water)
2. Salinity ($EC_e$) in root-zone during summer reached the same level as in the irrigation water ($EC_w$) then declined during winter to values no higher than 3% seawater

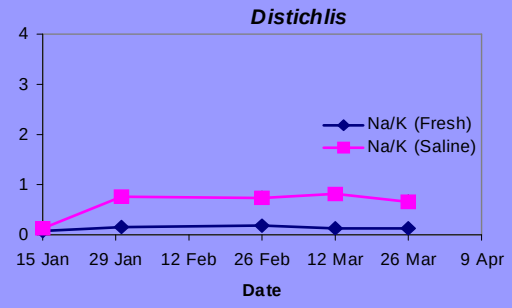
Effect of salinity on turf colour

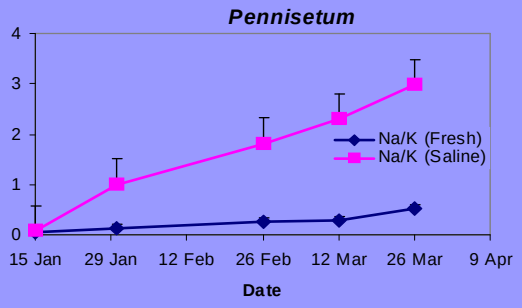



1. Turf colour assessed by using chromameter every two weeks
2. Data shows 3% improvement in greenness of *Distichlis* when irrigated with saline water whereas 11.4% decline in *Pennisetum*

Na/K ratio in leaves (molar basis)




1. *Distichlis* maintains low $Na^+$ concentration in leaves
2. Na/K ratio is 6 fold more in *Pennisetum* (non-halophytic species) compared with *Distichlis* (halophytic species)
3. K+ concentration didn't differ significantly in between the halophytic and non-halophytic species

1. **$Na^+$ concentration in leaf tissues increased 4.5 fold more in non-halophytic grass compared with a halophytic grass.**
2. **The colour of *Distichlis* improved through the use of saline irrigation water.**
3. **With the non-halophytic turfgrass colour declined when irrigated with saline water.**
4. **The colour of non-halophytic turfgrass recovered during winter season when salts were leached out of the surface soil by rain.**

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