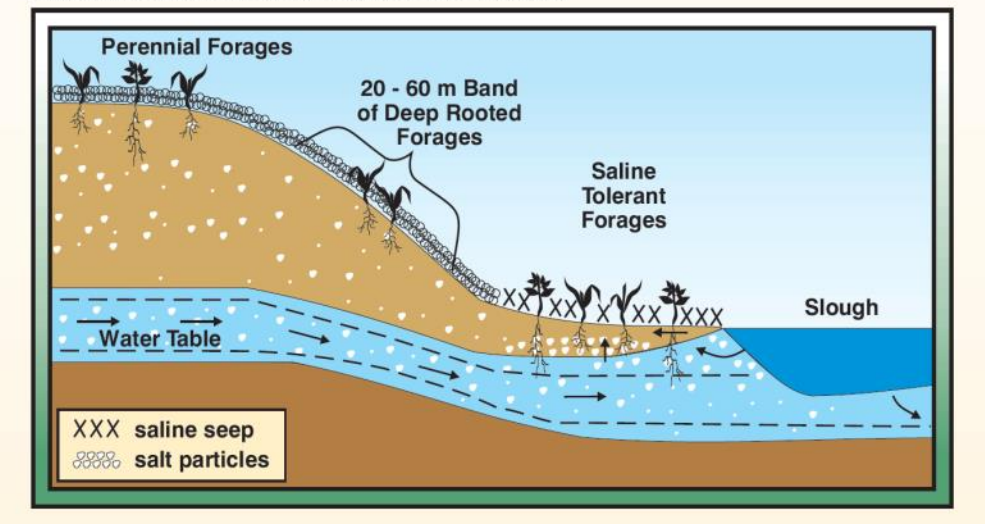
# Managing Salinity with Forages

Many cultivated areas of Western Canada face issues associated with salinity. Saline soils form when excess water in a recharge area moves into the ground water table and flows laterally. As the ground water moves through the water table, it dissolves and transports soluble salts until it reaches a discharge location where it surfaces. At the soil surface the water will evaporate, leaving the salts behind and throughout the soil profile.

## Forage Placement for Reducing Saline Problems




It is important to recognize the difference between a saline or sodic soil. Many producers will use the term “Alkali soils“ to identify both types. A saline soil with a normal PH of around 6-7 will have a high concentration of soluble salts like Sodium Chloride or Calcium Sulfate. These soils will have a combination of sodium, calcium, potassium or magnesium that combine with other ions in the soil creating a salt that will precipitate out.

Sodic soils on the other hand have a pH over 8.5 and have a high proportion of sodium, but not necessarily salt. The high level of sodium relative to calcium and magnesium will cause the clay particles to disperse and cause a breakdown of the soil structure.

Source: Manitoba Agriculture and Resource Development

## Soil Testing is Critical

It is very important to take a soil test in those areas where you experience reduced growth and yields to determine what soil properties you are working with.

Soil electrical conductivity (EC) is a measure of the amount of soluble salts in a soil.

| E.C (dS/m, mS/cm or mmho/cm)* | Degree of salinity | Hazard for crop growth | Plant Response | Relative tolerance of crops** |
|---|---|---|---|---|
| 0-2 | Non-saline | Very low | Negligible | |
| 2-4 | Slightly saline | Low | Restricted yield of sensitive crops | Beans, peas, corn, soybean, sunflower, clovers and timothy |
| 4-8 | Moderately saline | Medium | Restricted yield of many crops | Canola, flax, oats, wheat, rye, barley, bromegrass, alfalfa, sweet clover and trefoil |
| 8-16 | Severely saline | High | Only a few tolerant crops yield satisfactorily | Western, slender and tall wheatgrass, Tall fescue, Russian and altai wildrye |
| >16 | Very severely saline | Very high | Only a few salt tolerant grasses grow satisfactorily | |

Source: Soil Management Guide (MAFRD)

## Potential Management Strategies for Saline Areas

Effective water management under irrigation and cropping selection can be used to reduce soil salinity effects on your land. One can employ mechanical measures such as surface or tile drainage, or use the crop selection alternative.

Seeding a deep rooted forage crop such as alfalfa in a recharge area will reduce the water table and the effects of salinity in the discharge area. The use of barley in the discharge area as the most salt tolerant grain crop would be recommended. If barley production is an issue, consider seeding forages when the discharge area dries up or as a late fall dormant seeding.

Increase your seeding rate to compensate for the soil salinity concentration and select a multi species blend to provide cover, recognizing that the timing of forage establishment will vary with individual species. Species such as Tall Wheatgrass have a very high saline tolerance level, but are slower to establish verses Slender Wheatgrass, which is very quick to establish but not as long lived a perennial.

Look to species such as Dahurian Wildrye, Tall Fescue, Western, Slender and Tall Wheatgrass, Bromegrass, and some saline tolerant legumes such as our Rugged Alfalfa. It is important to note that the legumes will be rated as moderate in tolerance to salinity, so the perennial grasses listed above would be the predominate species in the blend.

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