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Salt Affected Soil: Its Impact and Management

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INTRODUCTION

Salt-affected soil is a type of soil that has high levels of dissolved salts, which can be harmful to plants and other organisms. These soils can occur naturally or can be created by human activities, such as irrigation with saline water or improper drainage. Salinity and sodicity are the two main types of salt-affected soil, and they can have different causes and impacts.

Saline soil is characterized by high levels of soluble salts, such as sodium chloride, magnesium sulphate, and calcium carbonate. These soils often have a high electrical conductivity (EC), which is a measure of the amount of salts in the soil. High EC values can indicate that the soil is saline. Saline soils can be further classified as either non-sodic or sodic, depending on the levels of sodium present. Non-sodic soils have low levels of sodium, while sodic soils have high levels of sodium and low levels of calcium and magnesium.

Sodic soil is characterized by high levels of sodium and low levels of calcium and magnesium. This type of soil often has a high pH and a low cation exchange capacity (CEC), which means that it can't hold onto nutrients very well. Sodic soils can be further classified as either saline-sodic or alkaline-sodic, depending on whether they have high levels of soluble salts or not.

Table 1. Classification of salt-affected soils used by the Natural Resources Conservation Service (NRCS)

Salt-affected soil classification	Electrical conductivity (EC)	Sodium adsorption Ratio (SAR)	Exchangeable sodium percentage (ESP)	Typical soil physical condition (Soil structure)
None	below 4	below 13	below 15	flocculated
Saline	above 4	below 13	below 15	flocculated
Sodic	below 4	above 13	above 15	dispersed
Saline-sodic	above 4	above 13	above 15	flocculated

Soil physical condition (dispersion or flocculation) also depends on factors not included in the NRCS classification system, including soil organic matter, soil texture, and the EC of irrigation water.

Overall, salt-affected soil is a major concern for agriculture and ecosystem health, and effective management and rehabilitation strategies are needed to combat the negative impacts of salinity and sodicity on plant growth and ecosystem functions.

Impacts of Salt Affected Soil:

Salt-affected soil can have negative impacts on plant growth and ecosystem functions due to the high levels of dissolved salts present in the soil. Some of the negative effects of salt-affected soil include:

1. Reduced plant growth and crop yields: High levels of salt can be toxic to plants and can lead to reduced growth and lower crop yields.
2. Impaired soil structure and water-holding capacity: Salt-affected soil can have a lower water-holding capacity and may be more prone to erosion and compaction, which can make it more difficult for plants to establish and grow.
3. Nutrient imbalances: Salt-affected soil can have an imbalanced nutrient content, which can lead to deficiencies or excesses of certain nutrients and further impact plant growth.
4. Ecosystem impacts: Salt-affected soil can also have negative impacts on the overall ecosystem, including reduced biodiversity and altered soil processes such as decomposition and nutrient cycling.
5. Human health impacts: Salt-affected soil can also have negative impacts on human health, as the high levels of salt in the soil can make the water and food grown in these areas less safe for consumption.

Management of Salt Affected Soil:

There are several approaches that can be used to manage and correct soil salinity:

1. Leaching: This involves using irrigation or rainwater to flush excess salts from the soil. Leaching is most effective in soils with a high water-holding capacity and good drainage.
2. Soil amendments: Adding soil amendments, such as gypsum or organic matter, can help to improve the soil structure and nutrient content, making it more conducive to plant growth.
3. Crop selection: Some crops are more tolerant of salt-affected soil than others. Choosing salt-tolerant crops can help to mitigate the negative effects of soil salinity on plant growth.
4. Irrigation management: Proper irrigation management can help to minimize the accumulation of salts in the soil. This includes using water with a low salt content for irrigation and avoiding over-irrigation.
5. Drainage: Improving drainage can help to remove excess salt from the soil and prevent the build-up of salts in the root zone.
6. Soil solarization: This involves covering the soil with a clear plastic sheet for a period of time, which can help to kill weeds and diseases, improve soil structure, and reduce salt levels.
7. Landscaping: Using landscaping techniques, such as terracing or contour planting, can help to prevent erosion and improve drainage in areas with salt-affected soil.

It's important to note that the most appropriate approach for correcting soil salinity will depend on the specific characteristics of the soil and the local climate and hydrology. A combination of these approaches may be needed to effectively manage and correct soil salinity.

REFERENCES

McCauley, A. and C. Jones. 2005. *Salinity and Sodicity Management, Soil and Water Management Module 2*. Montana State University publication 4481-2. http://landresources. montana.edu/swm

Richards, L.A (ed.). 1954. *Saline and Alkali Soils: Diagnosis and Improvement.* USDA Agriculture Research Service Handbook 60. http://www.ars.usda. gov/Services/docs. htm?docid=1279