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Perspective

Salt-Affected Soils and Their Management

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DESCRIPTION

Agricultural manufacturing within side the arid and semiarid areas of the arena is confined *via* way of means of bad water resources, confined rainfall, and the negative outcomes related to an extra of soluble salts, limited to a localized location or now and again extending over the complete of the basin. In order to limit vagaries of arid weather, deliver extra land beneath irrigation, and convey and stabilize extra yields consistent with unit location, several water improvement initiatives had been commissioned all around the world. Extension of irrigation to the arid areas, however, typically had caused a growth within side the location suffering from shallow water tables and to intensifying and increasing the risks of salinity.

Excessive salt accumulation in irrigated soil can reduce crop yields, reduce irrigation efficiency, destroy soil structure, and affect other soil properties. This publication is designed to help you assess the type and amount of salt in your soil and select alternative management practices. Soil salinity is one of the major environmental problems affecting large tracts of land in both developed and developing countries. Salinity is common in arid and semi-arid areas, where rainfall is too low to maintain a steady infiltration of rainwater through the soil and irrigation is carried out without natural or artificial drainage. Such irrigation methods without drainage management cause salt accumulation in the rhizosphere, negatively affecting several soil properties and crop yields. Globally, more than 900 million hectares (M hectares) of land, nearly 6% of the world's total area and about 20% of all agricultural land, are affected by salinization. Salinity is the product of a complex interaction of many variables that reduce the present and/or potential capacity of soils to produce goods and services.

Salinity is mainly due to the accumulation of salt over a long period of time, in the soil or groundwater table, usually created by two natural processes. The first is the weathering of base materials containing soluble salts which breaks down the rock and releases various soluble salts, mainly sodium, calcium and magnesium chlorides and to a lesser extent sulfates and sulphates carbonate. Sodium chloride is the predominant soluble salt. The deposition of sea salt transported by wind and rain is the second cause. "Circulating salts" are sea salts that are carried inland by the wind and deposited by precipitation, and are primarily sodium chloride.

Management

Soils that are too salty lead to poor and uneven crops, uneven and stunted growth, and low yields, dependent on salinity. The main effect of excess salinity is to make the plant less watery, although some is still present in the rhizosphere. This is because the osmotic pressure of the soil solution increases as the salt concentration increases. In addition to the osmotic effect of salts in the soil solution, over-concentrating and absorbing individual ions can be toxic to plants and/or may slow down the uptake of other essential nutrients by plants.

The degree of crop yield reduction depends on factors such as crop growth, soil salt content, climatic conditions, etc. In extreme cases when the salt concentration in the rhizosphere is very high, plant growth can be completely prevented. To improve plant growth in such soils, excess salts must be removed from the root zone. The term saline soil reclamation refers to the methods used to remove dissolved salts from the root zone. Commonly adopted or suggested methods to achieve this include the following

- The mechanical removal of salts that accumulate on the soil surface has had some limited success, although many farmers have used this method. While this method may temporarily improve plant growth, salt removal is still a major problem.
- Wash away salt build-up from the surface by running water over the surface sometimes used to desalinate soils with a salt crust. Since the amount of salt that can be flushed out of the floor is quite small, this method does not make much practical sense.
- This is by far the most effective procedure for removing salt from the soil's root zone. The leaching process is usually accomplished by accumulating fresh water on the surface of the soil and allowing it to seep through. The leaching process is effective when the saline runoff is removed through an underground drainage system to transport the washed salt

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away from the area to be recovered. Washout can reduce salinity in the absence of an artificial drainage system where there is sufficient natural drainage, i.e. water from the reservoir flows out without raising the groundwater table. It is best to carry out leaching when the soil moisture is low and the groundwater table is deep. As a rule, leaching during the summer months is less effective because large amounts of water are lost to evaporation. However, the actual choice will depend on water availability and other considerations.