

give it a white color. Black alkali is far more injurious to plants, and is due to the presence of sodium carbonate (washing soda) along with the above named salts. Sodium carbonate dissolves the vegetable matter in the soil and gives the soil water a dark brown or coffee color.

Harmful Effects of Alkali.

All plants take their food from the soil in the form of a weak solution. In alkali soils the soluble salts make the solution so strong that the plants cannot take up the moisture, and in some cases actually give up moisture to the soil and die. Hence we often find that alkali is the most injurious in seasons having fairly good spring rains followed by a dry summer. The spring rains dissolve a large amount of the salts, then, during the dry summer, excessive surface evaporation takes place, bringing the salts up into the root zone in a concentrated condition, causing the plants to quickly succumb to the drouth.

Black alkali also dissolves the humus in the soil and corrodes and eats away the stems of the plants at the surface of the ground. This is most apt to occur when plants are young, but may take place any time during the season.

Both classes of alkali, and especially black alkali, tend to destroy the soil's texture, breaking down the granular condition, causing it to become impervious to water, puddle when wet, and bake in bad clods when dry. This makes it very difficult to work such soils.

Treatment.

Many ways of handling alkali soils have been tried in the past with varying results. Remedies quite successful in one locality have proven utter failures when tried in other districts. It is well to state at first that no chemical means of treating white alkali has proven economical or practical.

Drainage.

As poor drainage is usually one of the direct causes of alkali, the first step in treatment is to supply the best possible drainage. The high cost of tile drainage eliminates this method at present, but a few open ditches will often remove the surface water in the spring and prevent it from collecting in these low places.

Cultivation.

After the best possible drainage has been secured, heavy application of strawy horse manure should be made at the rate of from fifteen to twenty tons per acre during the summer or early fall. The manure has three beneficial effects, first, it makes the soil more open and porous,