



The greatest salt concentration resulting from this every-other-row irrigation was directly in the cotton row.

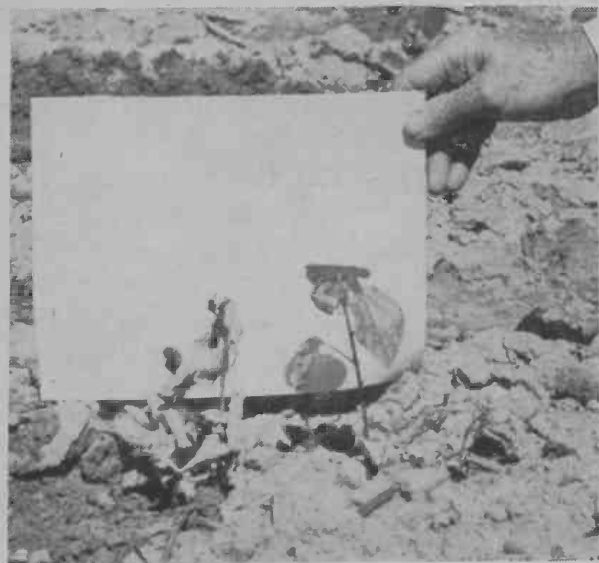
Farming Salty Land

All soils contain some soluble salts. In areas of adequate rainfall, these salts usually are leached away from normal soils just about as rapidly as they are formed.

In areas of low rainfall such as Arizona, however, soluble salts have a tendency to accumulate. This is especially true in locations where subsoil drainage is poor or where the irrigation water contains an excessive amount of salts.

Plants absorb very little of the salts contained in irrigation water. As

A 1-inch rain drove the salt down into the root zone and killed the smaller plants at left. The larger plant at right was not seriously injured.



water is taken into the plants or evaporates into the air, the salts remain in the soil. The accumulation of salts may become so great that normal crop growth cannot occur. Soils in such a condition are called saline soils.

Saline soils, to produce crops profitably, must receive careful management. All operations must be aimed toward keeping the concentration of salts in the plant root zone as low as possible. Irrigation and seedbed preparation are two of the important factors to be considered.

Leaching (washing) the excess salts down through a soil by a heavy irrigation is the only practicable means of reducing the salt concentration in the root zone. It is possible to reduce the concentration of salts in a soil in this manner even though the water being applied is also rather high in salts. On saline soils, then, periodic heavy leaching irrigations are essential. These often can be combined with a pre-planting irrigation.

For effective leaching, the water must be spread and must penetrate uniformly over the land. This can best be accomplished on land that has been properly leveled. Some form of flood or basin irrigation should be used so that the entire soil surface will be covered with water.

In preparing the land, use the least amount of tillage which will provide a satisfactory seedbed. This will vary somewhat, depending upon the soil being farmed. Excessive tillage tends to powder the soil and results in a slower rate of water penetration.

Salts Move With Water

Salts tend to move with the water in the soil and to become concentrated at the highest point of the bed or hill. Therefore, when beds are formed for row crops and the field is irrigated,

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All Soils Contain Some Soluble Salts

the salts may become so concentrated in the top of the bed that the young seedlings cannot survive. (See picture at left above.)

If the crop is planted on the side of the beds or on the level, however, the salt concentration may be enough lower that a good stand will be obtained. Research conducted in California by U.S.D.A. workers showed that under saline conditions, planting on sloping beds increased considerably the chances of getting a stand of cotton and sorghum.

Danger to Young Plants

Row crops planted on top of the beds are also susceptible to damage from rains coming soon after an early irrigation on salty land. The rain drives the salt directly down into the root zone of the young plants and may kill them. Older plants can withstand such stress to a greater extent. (See picture below at left.)

Salt damage may occur as a result of irrigating too early in the season if the crop is planted in the top of the bed. If insufficient water is applied to wet the soil across into the dry furrow when irrigating only every other row, the maximum salt concentration will be found in the crop row. An example of this is shown in the picture at right below.

Organic Matter Helps

Organic matter helps to keep the soil from running together and aids in obtaining rapid water penetration and aeration. Crop residues and barnyard manure are excellent sources of organic matter which should be returned to the soil wherever possible. Green manure crops may also be needed from time to time.