Available online at
www.agrospheresmagazine.com

ISSN: 2582 – 7022

Agrospheres:e-Newsletter, (2021) *2*(4), 76-79

Article ID: 218

Management Strategies for Soil Salinity

Ayesha Maqsood* and Muhammad Yaseen

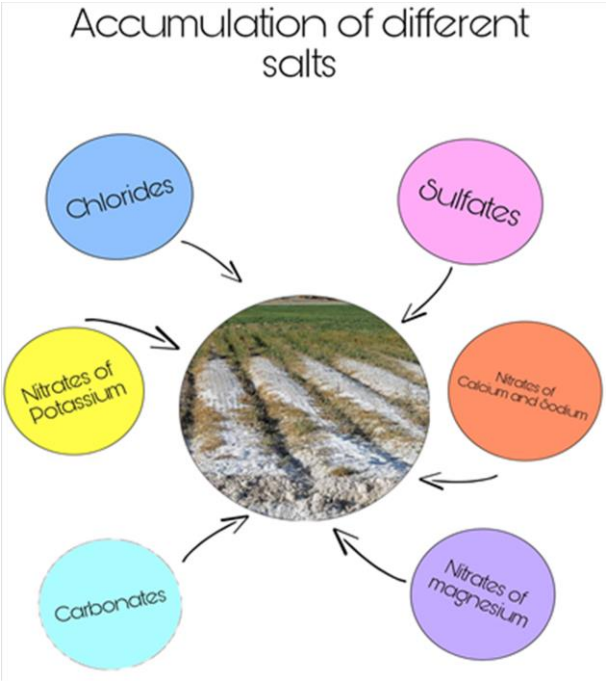
Department of Agricultural Extension, College of Agriculture, University of Sargodha, Pakistan

*Corresponding Author
Ayesha Maqsood*
E-mail: ashu2722001@gmail.com

Article History
Received: 14. 04.2021
Revised: 20. 04.2021
Accepted: 24. 04.2021

INTRODUCTION

Soil salinity is caused by the accumulation of excess salts in the root zone of the land. This excess salt creates an unbalancing situation among the required salts and nutrients for the crops. Installation of a fine drainage system can cover this problem on a very small percentage, to cover it on a high level with more accuracy there should be proper management. Such soils hold in many kinds of salts such as carbonates, sulfates, chlorides, along with nitrates of magnesium, potassium, calcium, and sodium. There are mostly insoluble in nature and stained whitish on the land surface. The derivation of these salts is due to the utilization of fertilizer and irrigation of crops. To detect the number of salts in the soil there is a way in which current is delivered through the soil, it gives the interpretations in the cast of electrical conductivity (EC). If the capacity of salts is enormous in the soil it will affect the yield of the crop.



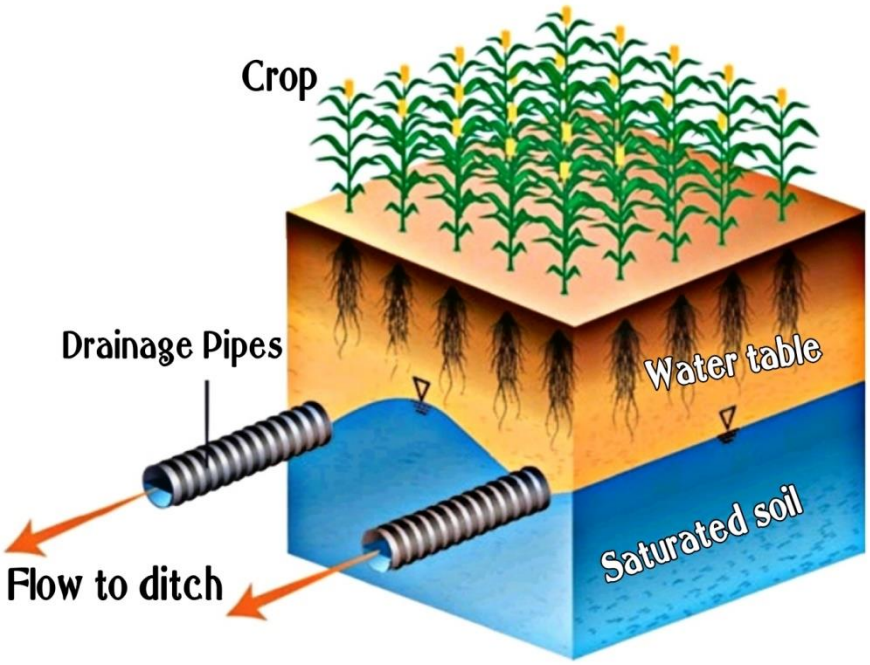
Due to salinity, various crops have contrasting effects on their yield, which limits minor crop damage to the entire decline of the crop. It is a difficult task to fulfill the willing low amount of salts in the soil, as it may be unachievable yet too expensive. Various methods and healing processes may apply to the soil to reduce the level of salts in the soil. Salinity-sensitive crops should not adopt in such high salted areas, however, some salinity tolerated crops can be grown there. The ability to tolerate salinity increases with the growth of plants, they are mostly hypersensitive at the time of evolution and initial seedling phase.

The soil having salinity cannot be rescued by applying fertilizers or chemically correction methods. It can only save by pulling out salts from the root zone of plants. Three methods are there to carry off salinity from the soil. In the first practice, excess salt can be wash out by spreading over the supply of water then the plant's demand. This practice is termed as leaching requirement method. In a next way, the damping condition of soil precept associates leaching requirement method along with false drainage. Last but not least practice of rescuing the soil is to transfer the salts beneath the root zone so they become inadequate to damage the crops. This effective practice is named managed accumulation. In the surface irrigation scheme, excess and improper amount of water results in washing out of salts, but if water is limited then it may leave salts behind on the soil profile. To apply more amount of water than needed irrigation, surface irrigators should analyze the leaching demand of the land. In the act of implementation of plenty of water, the basic nutrients from the soil and pesticides also wash out along excess salts. Leaching should be practice on leading times when the growing season is up, on a reserved basis with immense water quality. Depthless groundwater level surface faces more salinity than deep-seated groundwater level. At germination and seedling, phase maximum crop plants cannot carry salinity stress. After passing these initial stages, a mature plant can tolerate a high capacity of salts. Harvest time may consider the best time for the leaching process on large scale, as nutrients are pinch down to the ground, it will help in further crop germination. Leaching practice should be aiming at keeping in view the groundwater, drainage, and soil and irrigation system of that specific field.

To apply an excess amount of water in surface irrigation is an easy task, but in the case of sprinkler irrigation, it is quite difficult to control soil salinity by the leaching process. For better results, farmers should supervise the salt level of irrigation water and the EC value of the soil. Whenever the leaching process is done the salt, sensitive crops can be grown as part of the rotational pattern. With the passage of time salts start to assemble in the root zone, extra salinity tolerant crops should be grown there. Leaching practice should be at end of the crop rotation pattern. A crop rotation sample is pinto beans, corn, wheat, and barley.

The areas that have upper water tables may restrict the leaching process, to overcome the problem there is a way of artificial drainage. For this purpose, trim the drainage channels under the groundwater table and allow salts to drain out with water from the soil. In another way, plastic drainage pipes can spread under the soil to leach out the salts. For better results, the scheme and assembly of the drainage system should be operated by professional persons, as it can be a tricky task. You should also keep an eye on, clearance of drainage water. Routine discharge of wastes and water will cause problems and to cover this, it may cost high. An artificial drainage

system is beneficial for the farmer who has availability of immense quality and low salinity level in irrigation water, to drain out the excess amount of salts from the soil. This practice will not perform accurately if the soil will not get wet properly, because water will not drain. After completing this process, leaching practice can be performed. In intermittent ponding, various practices are performed instead of a single large one, which utilizes less amount of water.



To reduce salinity there is another method except for leaching, in which salts can transfer to areas other than the initial root zone with the help of satisfied crop bedding and surface irrigation. The basic purpose of this method is to protect the plant's roots and initial seedling stages from excess salts. In case of uneven dispersal of water, salts will accumulate in root zones and areas of seed germination that causes slow growth and even plant death. In a double row bed, structure homogenous irrigation is a demand to leave the sides free from adverse salinity level. Without the constant practice of water in bed systems, salts can collect at one of the furrows more than the other. For single-row bed systems, replacement of furrow in irrigation can be required to practice irrigation in particular furrow leaving behind the other furrow dry. In this way, salts can through to the area of the dry furrow. It is an attentive task to make sure enough supply of water in planted area to protect it from the accumulation of salts. Although it is a dangerous practice of removing salts because in case of heavy rainfall dry furrows contain salts can fill up with water and this mixture can push back salts towards the planted area. This problem can also happen if dry furrows are irrigated by mistake. The remaining crops cover the surface and protect it from evaporation, through which salts cannot show upward movement towards the root zone. Bare soil faces more quantity of salts due to heavy evaporation. To slow down evaporation, the field should be cover by 50 to 30 percent of the debris of crops. Due to these crop residues surface remain wet, this becomes more beneficial during winter rainfalls in leaching soil to protect seedling areas. In the drip irrigation method plastic mulches are used which, lessons the concentration of salts from evaporation. As some plants are very sensitive to salinity in their germination stages, so to

protect them we can use high-quality good water before the season. This water should fill the upper part of soil up to 12 inches to leach all the salts from this area. If we provide immense repetition of irrigation salts will leach out more accurately. By maintaining a high soil moisture level in between irrigations, salts will dilute in the root zone it will become less harmful. In Pakistan, flood or furrow systems are the most commonly used methods of irrigation. These methods are not able to control usage of water up to three or four inches, which is not suitable for the rescue of saline soil. Recommended methods for this purpose are sprinkler structures especially center pivot and linear move structures arranged with low energy precision application (LEPA), nozzle kit or separated drop nozzle, and irrigation through a drip. These methods give outstanding control to hold such kind of salinity. In arid and semi-arid areas, irrigation is necessary for the crops, which mostly comes with salinity problems. The excess amount of salts depends upon the local climatic conditions and the number of salts mixed with irrigated water. To manipulate soil salinity for the elongation of field productivity, we should manage soil moisture, irrigation strategies, and drainages. At last, we should select the right kind of crop according to the salinity conditions of the soil.