

Irrigation Water Quality Report

SUBMITTED BY:

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Date In: 7/1/2020

Date Out: 7/2/2020

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Lab No.	Electrical Conductivity mS/cm	Soluble Sodium %	Soil Texture	Irrigation Hazard	
				Salinity	Sodium
200001	1.03	19.3	Light	low	low
			Medium	low	low
			Heavy	medium	medium
			Light		
			Medium		
			Heavy		

*Refer to the back of this sheet for explanation of test results.

Terms:

Electrical Conductivity (EC) – measure of the total soluble salt concentration and is used to rank the salinity hazard of irrigation water. The unit of measurement is millisiemen per centimeter (mS/cm).

Sodic Soil – Soil that contains excess sodium that destroys (disperses) soil aggregates and drastically reduces permeability. Has greater than 15% exchangeable sodium and an EC of less than 4 mS/cm.

Table 1. Salt tolerance of selected field, vegetable, and forage crops.

Crop	Electrical Conductivity of saturation extracts at which yields decrease by about 10 percent	Soil Salinity Classification
	mS/cm	
Bermuda Grass	13	Very High
Barley	12	
Tall wheatgrass	11	
Cotton	10	
Wheat	7	High
Tall Fescue	7	
Sorghum	6	
Soybean	5.5	Medium
Corn	5	
Tomato	4	
Alfalfa	3	Low
Potato	3	
Sweet corn	3	
Onion	2	
Red Clover	2	
Beans	1.5	

Adapted from USDA Bulletin 283

The irrigation water quality charts used for making rankings depend on the texture of the soil. The charts are based on experiments conducted by the Kansas State University and utilize the electrical conductivity and soluble sodium percentage of the irrigation water in addition to the texture of the irrigated soil as the criteria.

Interpreting Salinity and Sodium Hazards:

Salinity:

Low Salinity Water – Water can be used for irrigation with most crops with little chance that salinity will develop. Some leaching is required but this occurs under normal irrigation and rainfall, except in soils characterized by low permeabilities.

Medium Salinity Water – Water is acceptable for irrigation, but moderate amounts of leaching are necessary to control salt accumulation. Irrigators normally apply sufficient water to provide the necessary leaching but some will need to increase the amount of water applied. Most field crops common to Kansas can be grown without difficulty if the above precautions are followed.

High Salinity Water – Water is of questionable quality for irrigation due to the likelihood of salt accumulation. Adequate leaching and growing salt tolerant crops may allow the use of this water but favorable drainage conditions are a must.

Very High Salinity Water – Water is not suitable for irrigation under most conditions but may be used occasionally under special circumstances where the soil is permeable and the subsurface drainage is excellent. Considerable leaching is necessary and salt tolerant crops should be selected.

Sodium:

Low Sodium Water – Can be used for irrigation on virtually all Kansas soils with little danger that the soil will disperse due to harmful sodium accumulations.

Medium Sodium Water – Water is of permissible quality for most soils. Precautions should be taken so that excess exchangeable sodium does not develop.

High Sodium Water – May produce harmful sodium levels. Chemical amendments, permeable soils, good subsurface drainage, and careful soil management would be required for sustained use of this water.

Very High Sodium Water – Generally not acceptable for irrigation. A major portion of the soils irrigated with this water may disperse unless the water is low or medium in salinity and gypsum or other chemical amendments are added to reduce the sodium hazard to low or medium.