Pecos River Salinity and Crop Tolerance





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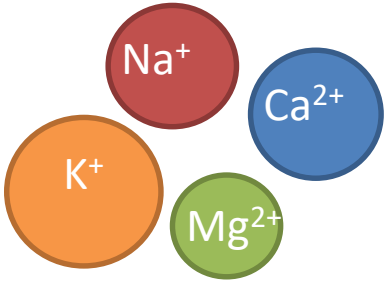
Irrigation Salinity and Sodicity

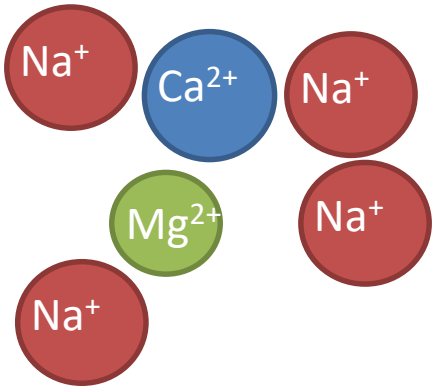
Salinity refers to the concentration of cations in irrigation water



Upsets osmotic balance

Mimics water deficiency

Sodicity occurs when there is a relative abundance of Sodium (Na^+) compared to other cations.



Sodium is toxic to plants:

Degrades soil structure

Decreases soil porosity and permeability

Described as Sodium Adsorption Ratio (SAR)

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Salinity of Pecos River Water, USGS 2005

PPM

675

1,527

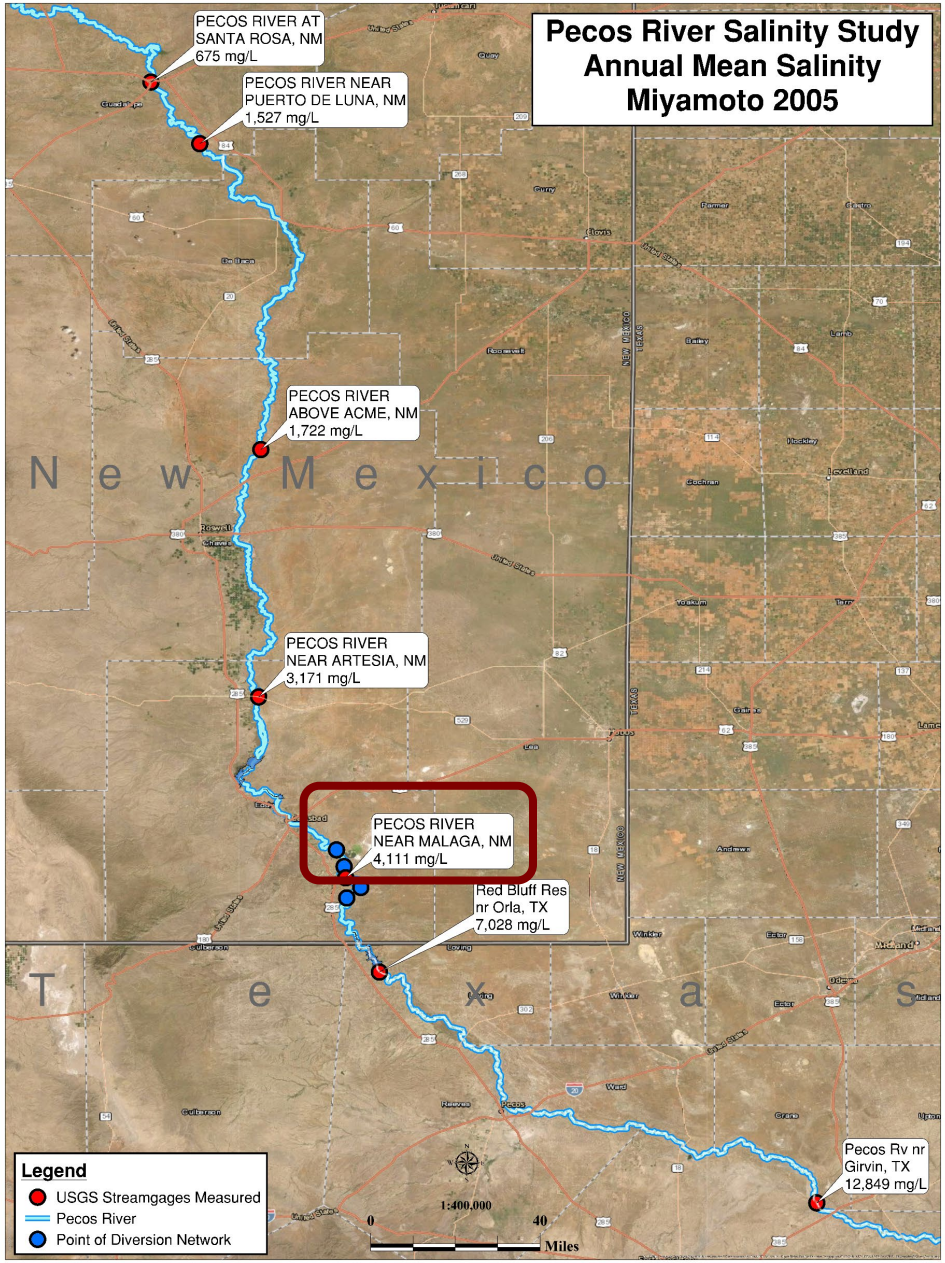
1,722

3,171

4,111

7,028

12,849



Source	PPM
Drinking Water*	500
Agricultural Tolerance**	600-4,480
Sea Water	34,700

*EPA recommended maximum

**agricultural tolerance is highly crop dependent

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Toxicity of Pecos River at Diversion Point ★

Salinity causes issues with the osmotic balance for crops. The damage mimics water deficiency.

Sodium is a part of salinity, but this ion can also be toxic to plants at high ratios of Na^{+} to Ca^{2+} and Mg^{2}+ This ratio is called 'Sodium Adsorption Ratio' or SAR.

Chloride ion toxicity is also a risk across many crops.

Characteristic	Average Crop Threshold	Actual June 6 2017	Actual Oct. 30 2019
Salinity (ppm)	<600-4,500	4,330	4,740
Sodium Toxicity (SAR)	<3	9.4	9.6
Chloride Toxicity (mol/L)	<4-10	34	39

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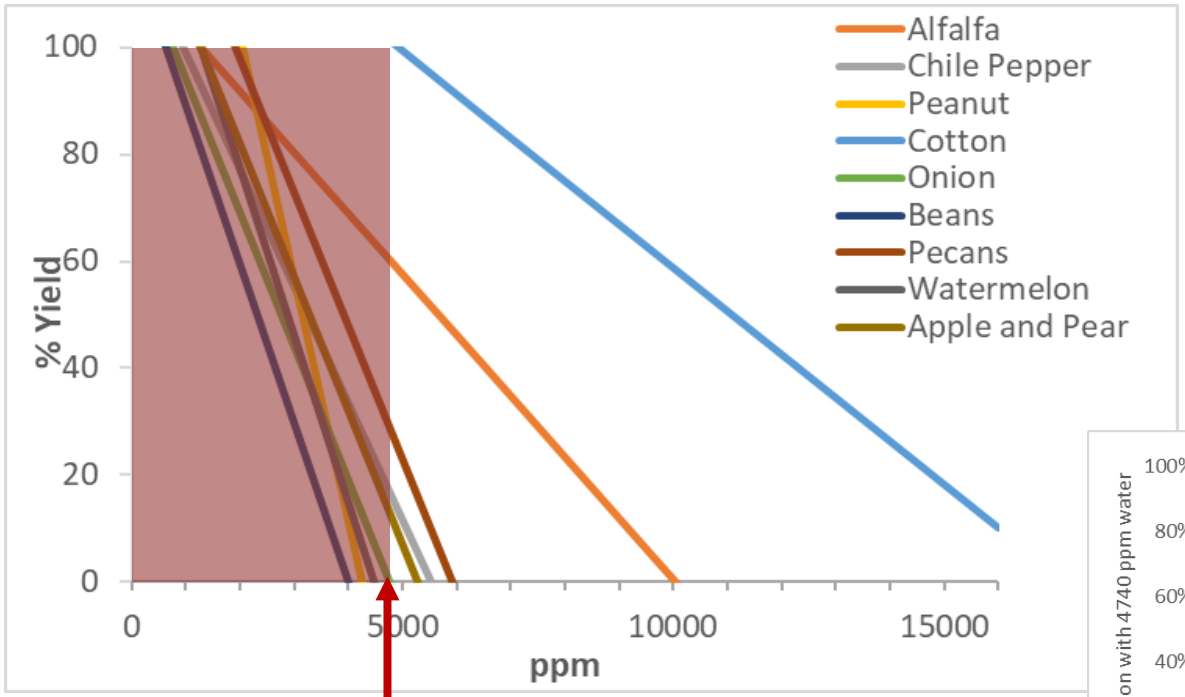
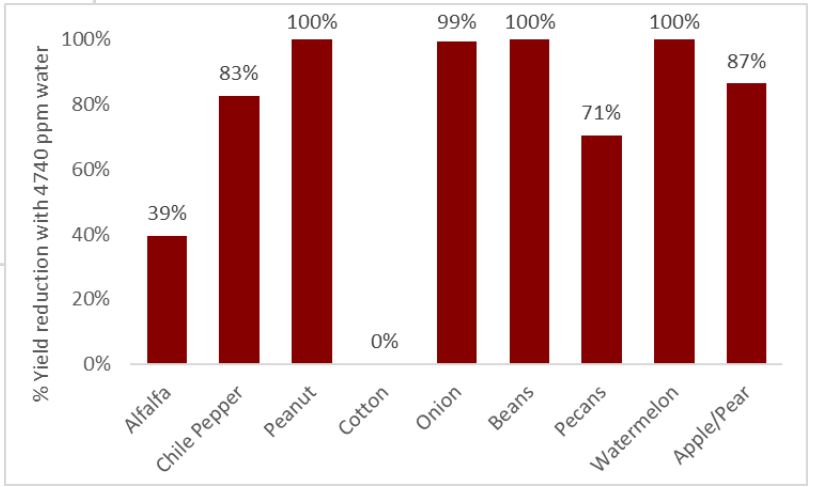
Significant Yield Reduction as Salinity Increases



Pecos River
4,740 ppm

40-100% Yield Reduction for majority of key NM crops when using water at 4,740 ppm



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Sources: FAO, NASS, NMSU, Utah State

Final Thoughts

The salinity of the Pecos River at the Carlsbad Diversion point has over **4,740 ppm**, whereas most key New Mexico crops tolerate under 2,560 ppm.

The concentration of sodium and chloride are each at levels toxic to most plants.

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THANK YOU

Reach Out! https://www.intrepidpotash.com/
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