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Managing Water in the West

Reclamation Saltcedar Management Activities September 26, 2007

U.S. Department of the Interior
Bureau of Reclamation

Herbicide applications with a Carpet roller applicator

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Potential Benefits

Selective

No soil contact or damage to herbaceous under-story

No drift

Easily incorporated into mowing program

Management of Saltcedar Regrowth with Carpet-Roller Applied Herbicide

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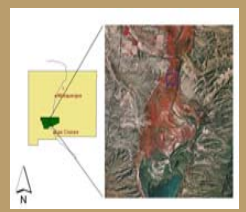
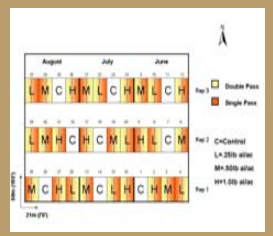




Objectives & Methods

Objective 1. Determine the effect of 3 rates of herbicide applied in mid-June, July and August 2005 by a carpet-roller on previously mowed saltcedar.

Methods: A permanent belt transect (2x30m) was centrally placed in a north and south direction within each split plot. All live and dead saltcedar rooted within belt transects were counted to determine apparent plant mortality in May and September 2006. Analysis of variance was used to test for pass and treatment effects at alpha .05.

Objective 2. Evaluate the relationship between saltcedar growth characteristics at the time of application to later plant mortality.

Methods: The point-center-quarter method was utilized at the north and south ends of our permanent transects to select the closest plant within each quarter. Height, number of stems, and minimum and maximum diameter (for volume calculations) were measured on each of these permanently mark plants at the time of carpet-roller applications. Every plant was revisited in September 2006 to determine mortality. Using logistic regression, pre-treatment plant measurements were used as covariates to relate to saltcedar mortality (alpha .05).

Objective 3. Determine understory vegetation response following chemical applications with the carpet-roller.

Methods: Ten 0.28 m^2 frames were placed every 3 m along permanent transects. Percent aerial cover was estimated for each species rooted within a frame. Grasses and forbs were then grouped into annuals and perennials. Litter and bareground was also estimated. Analysis of covariance was conducted to test for both pass and treatment effects using pre-treatment cover estimates as the covariate at alpha .05.

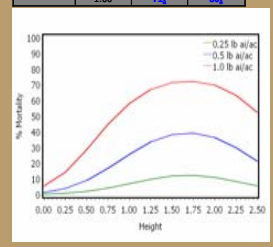
Results

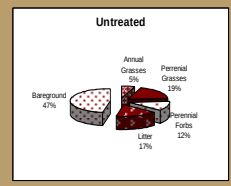
Apparent mortality was highest and comparable among mid-June and -August treatments at 0.5 and 1.0 lb ai/ac imazapyr rates. Although not always statistically different, mid-July treatments generally provided lower saltcedar mortality than other spray dates. There was no difference in saltcedar mortality from one or two carpet-roller passes made at comparable herbicide rates, irrespective of treatment date.

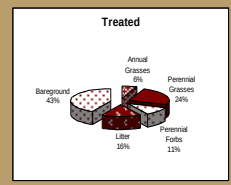
Saltcedar height at the time of treatment was the most important plant characteristic for predicting mortality from mid-June and –August treatments (p-value = .0235 and .0360 respectively). Volume was most important for mid-July treatments (p-value = .0206). In general, saltcedar <1 m in height were poorly controlled by the carpet roller compared to taller plants.

Grass, forb, litter and bareground cover was not significantly different between untreated and carpet roller treated plots at the end of the 2006 growing season.

Treatment Month	Herbicide Rate (lb ai/ac)	% Apparent Mortality by Evaluation Date 5/16/06	9/15/06
mid-June	0.00	1_{f}	1_{d}
	0.25	26_{de}	11_{cd}
	0.50	59_{ab}	37_{ab}
	1.00	56_{ab}	40_{ab}
mid-July	0.00	1_{f}	1_{d}
	0.25	17_{ef}	3_{d}
	0.50	36_{cd}	10_{cd}
	1.00	53_{b}	26_{bc}
mid-August	0.00	1_{f}	0_{d}
	0.25	33_{cde}	6_{d}
	0.50	45_{bc}	38_{ab}
	1.00	71_{a}	50_{a}







Conclusions & Management Implications

A carpet-roller can be used to apply imazapyr to suppress saltcedar growth without damaging understory vegetation. Having sufficient vertical top growth after mowing is necessary to obtain adequate herbicide coverage. Our results suggest that about ¾ of the plant foliage must come in contact with the carpet roller to maximize saltcedar mortality. Long-term maintenance costs can be reduced by prolonging mowing intervals using this method.

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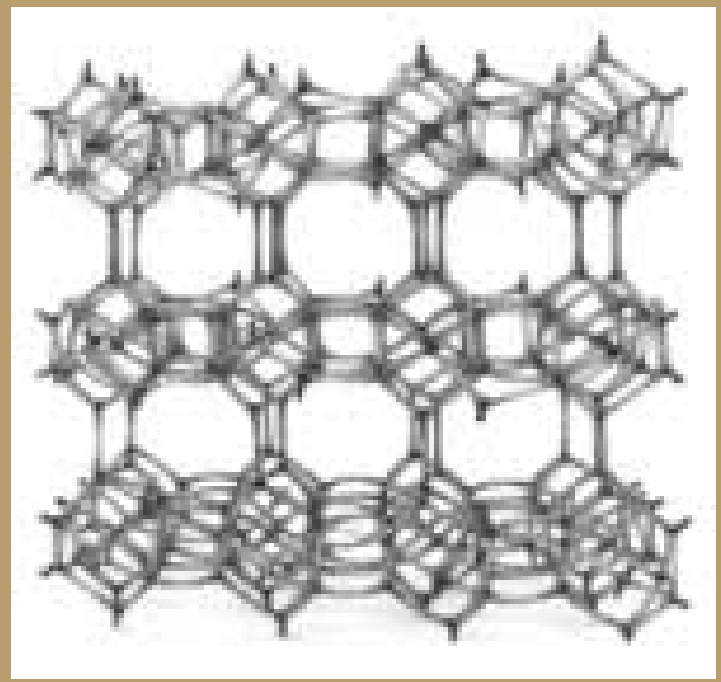
Establishment of Vegetation Using Zeolite (Clinoptilolite) in Regions of Shallow Groundwater in New Mexico

Investigators: Brent Tanzy, Eugene Adkins, John Bokich, Salim Bawazir, Scott O'Meara and Mark Walthall

- Generally speaking, natural zeolites are hydrated aluminosilicates. They consist of an open, three-dimensional cage-like structure and a vast network of open channels extending throughout. Loosely bound, positively charged atoms called cations, are attached at the junctures of the negatively charged aluminosilicate lattice structure. The aluminosilicate framework provides exceptional strength and stability to the lattice structure.



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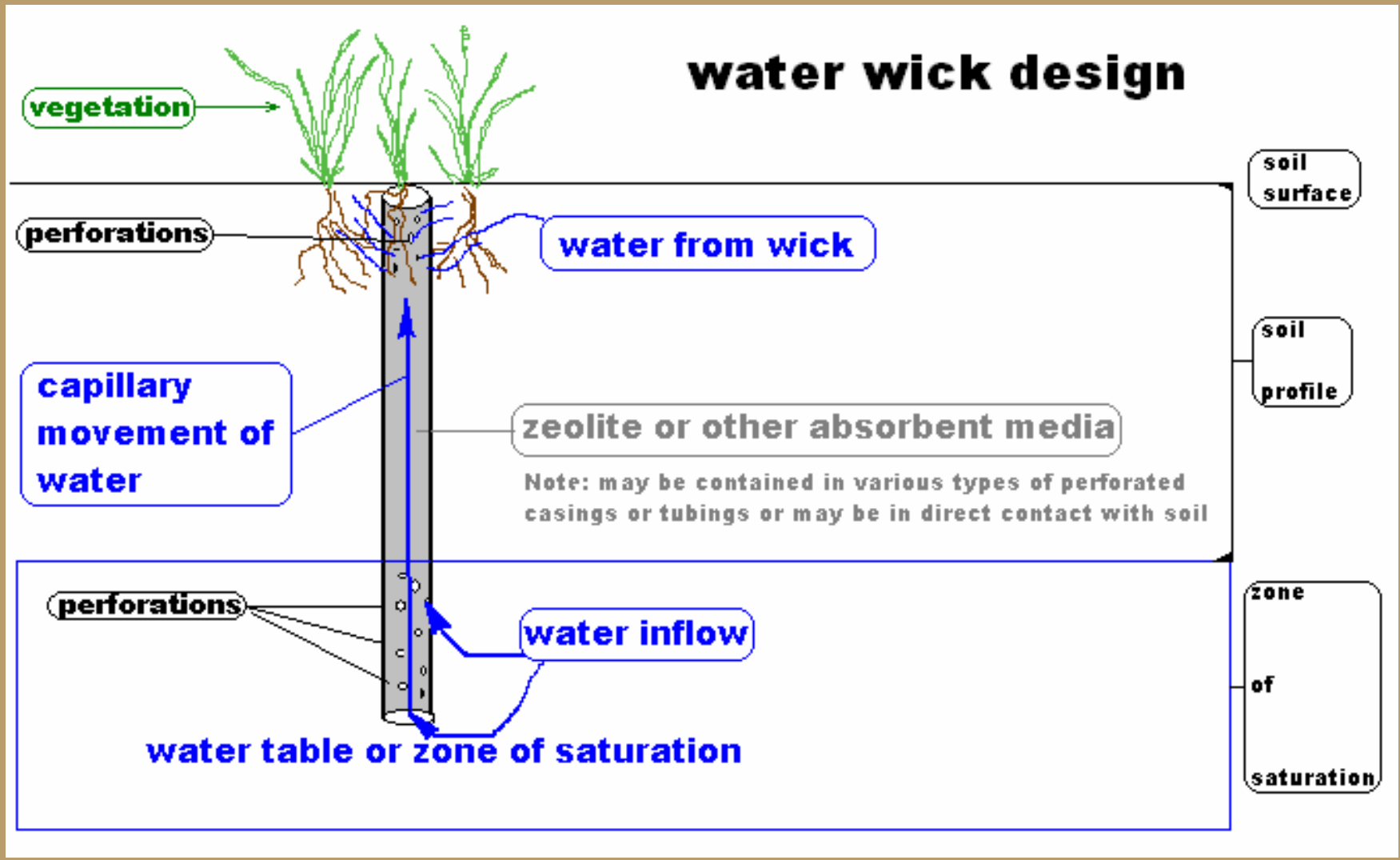
Waterwicking with zeolites?



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Eric Lopez showing the height of capillary rise in zeolite portion of the 4-inch split sample of zeolite and sand- 2.89 ft (11 days) above water table

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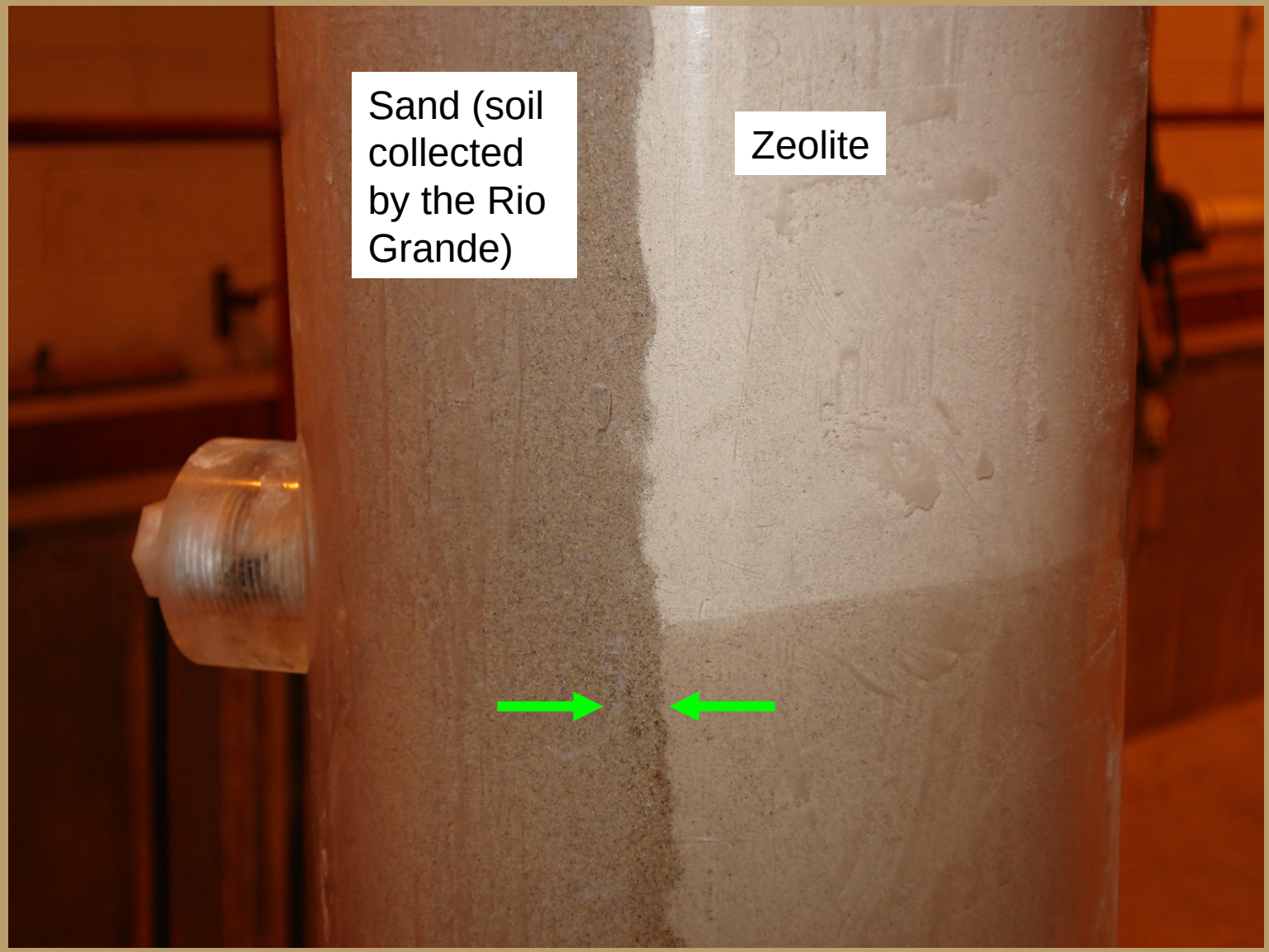
A closer look – minimal horizontal movement



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Is there enough water at the top?

Field trials

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KUBOTA
KX61-2


KUBOTA
4x4

Stay tuned for more Results!!!!

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A parting thought

- “Success depends not only upon the current efforts underway, but on our ability to uncouple from the crisis management associated with droughts, and to keep commitments towards maintenance and restoration long after the drought ends.”

Your Invasive Species Team!

Fred Nibling...Brent Tanzy ...Joe Alderete

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