

Experiment in Sub-Irrigation Tubes Shows Promising Results

Nearly two years ago the Bridger Plant Materials Center (PMC) began a unique experiment using PVC piping to more efficiently deliver water to plants in semi-arid environments. The process is accomplished by infiltrating shrubs and trees with water beneath the surface.

Because sub-irrigation delivers water below the soil surface, the theory is that roots will grow deeper thus helping to increase woody plant survival, especially during periods of drought.

“Another possible benefit with deep watering may be reduced soil surface evaporative losses, a result of reduced hydraulic conductivity as the moisture content of the surface dries out,” said Joe Scianna, research horticulturist at the Bridger, PMC.

The Bridger study includes four species; green ash *Fraxinus pennsylvanica*, bur oak *Quercus macrocarpa*, ponderosa pine *Pinus ponderosa*, and Rocky Mountain juniper *Juniperus scopulorum*. These species were selected because they represent a good mix of root system habits and rates of growth. Fifty percent of the trees were watered with tubes, the other half were hand watered on the soil surface.

Although it is too early to draw firm conclusions, several trends did emerge over the 2005 and 2006 growing seasons. The tubes did not improve the survival or growth rate on either site in 2005. Test excavations revealed that little water was reaching the small establishing root system in 2005. Almost no water appeared to be reaching the upper levels of the soil profile.



Ash Tree (above)



Installing irrigation tubes (right)

“To address this issue without relocating the tubes, extensions were added,” said Scianna. “In 2006, only green ash seedlings with tubes at the fallow site showed any superior growth over trees without tubes. This might be because the fast growing green ash root systems were better positioned to take advantage of the supplemental moisture.”

An interesting development is the dramatic difference in height growth and vigor rating between the fallow and vegetated sites. All species, with the exception of the ponderosa pine in 2005, grew much taller and had higher vigor ratings, regardless of the manner in which supplemental water was delivered, on the fallow site. These results are a prime example of the benefits of

herbaceous vegetation control when establishing tree and shrub seedlings – at least in semi-arid environments and given the amount of supplemental water provided.

“Although refinement of this technique will be necessary, the study should answer some fundamental questions regarding the potential usefulness of sub-irrigation tubes in the real world,” said Scianna.

The project was initiated by Robert Kilian, NRCS Area Rangeland Specialist and funded in part by a Grazing Lands Conservation Initiative grant. The Montana Conservation Seedling Nursery in Missoula, Montana, is also partnering on the project. This concept is based on similar work conducted at the Los Lunas Plant Materials Center in New Mexico.

Contact: Joseph Scianna
Joe.Scianna@mt.usda.gov

NRCS Helps Plant Seeds of Hope at Healing Garden

A small seed can grow into something great. That is the symbolic idea behind the AiKiRuti Healing Garden. AiKiRuti – pronounced I-key-ru-dee – is a project started by members of the Winnebago Tribe. AiKiRuti, which means “helping hand”, hopes to be a helping hand in fighting drug and alcohol abuse in the Winnebago Tribe and their northeast Nebraska community.

The healing garden was started in 2002 when over 100 varieties of indigenous plants significant to the Winnebago people were planted at the one-acre site in Winnebago, Nebraska.

Members of the community worked to prepare the site for planting. The Natural Resources Conservation Service (NRCS) supplied seed for the garden through the Nebraska Loess Hill RC&D and the NRCS Plant Materials Center (PMC) in Manhattan, Kansas. The PMC has plans to do additional seeding in 2007.

Mark Janzen, plant materials specialist at the PMC, said the idea behind a healing garden is that plants can bring healing and hope to a community.

“These plants will help focus tribal members back towards their cultural heritage and help them identify the significance that plants had in their cultural history,” Janzen said.

Members of the Winnebago Tribe have become enthusiastic about learning the role plants played in their cultural history. Local children volunteered to plant buffalo grass at the healing garden’s tee pee site. CeCe Earth, a member of the AiKiRuti organization said this provided an opportunity for Winnebago children to restore a piece of their tribe’s culture.

“These kids rode their bikes to the garden to check on their grass. They were really excited to see how well it was growing. It is now one of the most sacred sites in the garden,” Earth said.



Bob Starck, volunteer with AiKiRuti Healing Garden, shows plans of the healing garden to NRCS State Forester, Constance Miller.

The AiKiRuti organization wants to build a cultural learning/visitors center. The center will provide a place of cultural discovery for members of the Winnebago Tribe, and provide an opportunity for non-Indians to participate in cultural and educational activities alongside members of the Tribe.

“It can take a long time for a garden like this to really start to look like something. But if you look closely you can see some beauty and hope emerging,” Earth said.

Hope is what has kept this project moving forward. AiKiRuti can also be interpreted as meaning “a hand reaching out to help”. Members of the Winnebago Tribe are hoping this healing garden will soon live up to its name.

Contact: Joanna Pope, NRCS Public Affairs Specialist, at: Joanna.Pope@ne.usda.gov

Helpful Plant Materials Tech Tips: Spring is for Planting – Are you Ready?

With planting season not too far away, the Plant Materials Program has information on the web to help plan and install your new conservation planting.

Check out our “Seeding and Planting” page at <http://plant-materials.nrcs.usda.gov/technical/seeding/> for useful tips on planting grasses, wildflowers, trees and shrubs.

Our Mission: *Develop and deliver plant-science technology to meet the nation’s natural resources conservation needs.*

The United States Department of Agriculture (USDA) prohibits discrimination in all its programs on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA’s TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write the USDA, Director, Office of Civil Rights, Room 326W, Whitten Building, 14th and Independence Avenue, SW, Washington, D.C., 20250-9410 or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.

Visit us: <http://Plant-Materials.nrcs.usda.gov>