



Tallgrass Prairie CENTER

Restoring a National Treasure



Mission: The Tallgrass Prairie Center develops research, techniques, education and source identified seed for restoration and preservation of prairie vegetation in rights-of-way and other lands.

Plasticulture for Wetland Seed Production Fall 2009

The Natural Selections Program is utilizing plasticulture for establishment and seed production of native wetland species, particularly sedges (*Carex*). Plasticulture is a technique utilizing plastic film covered beds with drip tubing (t-tape) for irrigation installed beneath the film. Plasticulture has been used in vegetable,

cut-flower, melon and berry production since the early 1960's (Sweat 2007). Soil beneath the plastic retains heat, moisture, and nutrients, having the summary effect of lengthening the growing season, promoting establishment, and increasing plant size and crop yields. Our first year experience with this system shows great potential for seed increase of species that are difficult to establish, limited in initial seed quantities, require irrigation, or are of high-restoration or market-value. Some species that normally require two years to flower from seed may flower and set seed the first growing season from greenhouse grown plugs transplanted into plasticulture beds (Rattlesnake master, *Eryngium yuccifolium*, *Carex bebbii*, *C. tribuloides*, *C. brevior*, *C. molesta*).

The versatility of the plasticulture system provides efficient irrigation, minimizes weedy competition during establishment and



Bedforming, drip tape unspooling, and mulch laying all in one operation.



Water wheel marker perforating plastic mulch for seedling plugs.



*Carex plots on Aug 5, 2009 of first growing season, swamp milkweed (*Asclepias incarnata*) in foreground.*

shows great potential for seed production of many native species, particularly wetland species. We will assess seed yields, stand life, and weed pressure over the next few years to determine which *Carex* species, in particular, are practical for agronomic seed production using this system.

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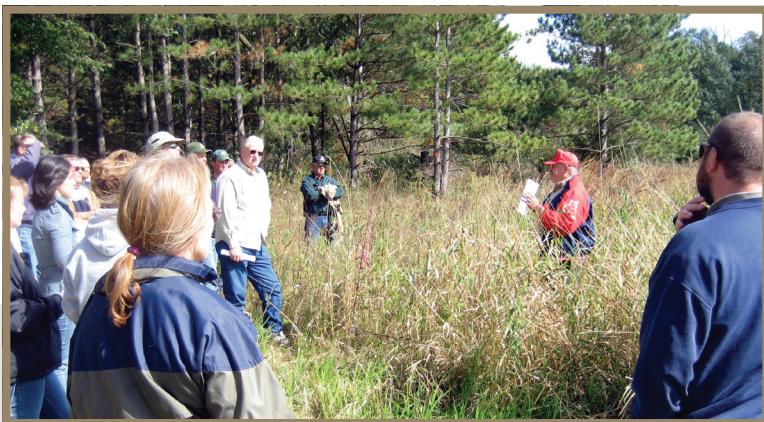
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Prescribed Fire Workshops for NRCS Personnel

The Tallgrass Prairie Center provided in-service workshops to NRCS staff on the use of prescribed fire in vegetation management. Workshops were held at five locations across the state: one each at UNI and O'Brien County in March; and Adams, Washington and Hamilton counties in September. Although NRCS personnel no longer conduct prescribed burns, they often deal with landowners considering prescribed fire as an option in mid-contract management on the Conservation Reserve Program sites and other conservation plantings. Workshop topics included the following: vegetation response to fire, fire history and ecology, effects of fire on wildlife, soils and hydrology, planning and conducting a prescribed burn, public perception of fire, and smoke management. A key component of discussion was the use of prescribed fire in mid-contract management and how it compares with the other NRCS approved techniques of disking or herbicides. Discussion also explored opportunities for developing trained prescribed fire crews and fire equipment caches across Iowa.

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Daryl Smith leads discussion of on-site burn plan development with NRCS Field Technicians at Briggs Woods Park, Hamilton County.

White Chicken Chili on the Range

Courtesy of Mary Weld

1 lb boneless, skinless chicken breast
1 med onion, chopped
1 1/2 tsp garlic powder
1 T extra virgin olive oil
1 16 oz can great northern beans
1 16 oz can chicken broth
1 4 oz can chopped green chilies
1 t salt
1 t ground cumin
1/2 t pepper
1/4 t cayenne pepper
1 cup sour cream
1/2 cup whipping cream



Cut Chicken into bite sized pieces. Rinse and drain beans. In large sauce pan, saute chicken, onion, garlic powder and oil until chicken is done.

Add beans, chicken broth, chilies and season-

ings. Bring to a boil. Reduce heat and simmer uncovered for 30 minutes. Remove from heat. Stir in sour cream and whipping cream. Ole' Enjoy!

Very good topped with your choice of crushed corn chips, Doritos, shredded cheeses. cilantro, salsa, use your imagination!

Natural Resources Fall Seminar Wrap-Up

Topics of this fall's Natural Resources Research and Management (NRRM) seminar at the Tallgrass Prairie Center were: Potential Ecological Effects of the 2008 Iowa Floods, John Pearson, Ecologist, Iowa DNR; Ecological Performance of Mitigations Wetland in Iowa, Terry VanDeWalle, Natural Resources Consulting; Ground Beetles, Prairies, and Fire: Managing for Biodiversity, Kirk Larsen, Professor, Luther College; and Roosting by Indiana Bats: How Important are Human-Made Structures; Russ Benedict, Professor, Central College. We would like to thank all of the presenters who participated. NRRM Seminars are a great opportunity to get first hand information in a personable and casual setting. Students, faculty, and interested public are welcome to attend. Refreshments provided (Editors note: Ryan makes a mean cowboy cookie!). Seminars are held on Wednesdays at 4 p.m at the Tallgrass Prairie Center, Spring and Fall semesters. For more information, to suggest ideas for future seminars, or to get advanced notice of upcoming seminars contact Ryan Welch, rwelch@uni.edu (319) 273-3828 or become a fan of the Tallgrass Prairie Center on Facebook.



John Pearson, Ecologist, Iowa DNR presents at NRRM Seminar series.

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NEWSLETTER

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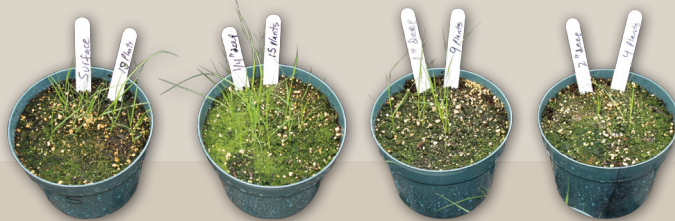
Plant shallow!

Planting depth is critical to the success of native plant establishment. Packard and Mutel (1997) recommend planting native seed into the soil at the depth of twice the thickness of the seed. For most native species this equates to planting the seed ¼ inch or less. For a visual comparison, an eraser at the end of a pencil is ¼ of an inch thick. To test this claim, we conducted a greenhouse experiment to determine if planting depth affected seedling emergence. Seed of three native species were chosen, a large grass seed - Canada wild rye (*Elymus canadensis*), a small grass seed - tall dropseed (*Sporobolus compositus*), and a very small forb seed - common mountain mint (*Pycnanthemum virginianum*). Forty seeds of each of these species were planted at four different depths – surface, ¼ inch deep, 1 inch deep and 2 inches deep.



Canada wild rye - good emergence at all sowing depths.

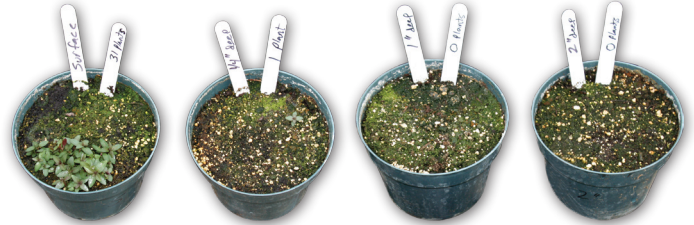
What we found was that planting depth had a huge effect on seedling emergence and seed size appeared to be a significant factor. Seedling emergence increased when small seeds were planted shallow (¼ inch or less) while large seeds emerged well across all planting depths. Canada wild rye seeds planted on the soil surface emerged as well as when planted 2 inches deep. It appeared that large seeds have sufficient energy in the seed to become established when planted on the surface before drying out and also have enough energy to successfully emerge when planted deep. This may be one reason why Canada establishes well in a new planting. By contrast, emergence of small seeded tall dropseed decreased as the planting depth increased. The



Tall dropseed - Surface - 18 plants; 1/4" depth - 15 plants; 1" depth - 9 plants; 2" depth - 4 plants

trend was clear here, to maximize seedling emergence of small seeded species, plant shallow (¼ inch or less). Very small seeds had a more extreme response to planting depth than the small seeded species. Surface sowing common mountain mint resulted in 31 seedlings and only one seedling when planted ¼ inch deep and no seedlings at the deeper depths. Light may be essential for germination of very small seeded species (Prairie Moon Nursery 2009). In the greenhouse where light was maximized, it appeared that any covering of very small seed with soil restricted enough light to significantly reduce seedling emergence.

This greenhouse experiment clearly demonstrated that to maximize emergence of all species in a prairie seed mix, plant large and small seed shallow (¼ inch or less) and plant very small seed (100,000 or more seeds per ounce) on the soil surface without incorporating into the soil. For a list of native species with very small seeds see (Table 1).



Common mountain mint - Surface - 31 plants; 1/4" depth - 1 plant; 1" depth - 0 plants; 2" depth - 0 plants

Grasses		Moisture Class	seeds/oz
Blue Joint Grass	<i>Calamagrostis canadensis</i>	W	248880
Brown Fox sedge	<i>Carex vulpinoidea</i>	W-M	100000
Fowl Manna Grass	<i>Glyceria striata</i>	W-M	160000
June Grass	<i>Koeleria macrantha</i>	D	400000
Rice Cut Grass	<i>Leersia oryzoides</i>	W	200000
Dark-green Bulrush	<i>Scirpus atrovirens</i>	W	460000
Wool Grass	<i>Scirpus cyperinus</i>	W	1700000
Forbs			
Prairie Sage	<i>Artemisia ludoviciana</i>	M-D	250000
Harebell	<i>Campanula rotundifolia</i>	D	900000
Joe Pye Weed	<i>Eupatorium maculatum</i>	W	95000
Boneset	<i>Eupatorium perfoliatum</i>	W	160000
Grass Leaved Goldenrod	<i>Euthamia graminifolia</i>	W-M	200000
Bottle Gentian	<i>Gentiana andrewsii</i>	W-M	280000
Sneezeweed	<i>Helenium autumnale</i>	W-M	130000
Prairie Alumroot	<i>Heuchera richardsonii</i>	M-D	700000
Great St. Johns Wort	<i>Hypericum pyramidatum</i>	W-M	190000
Cardinal Flower	<i>Lobelia cardinalis</i>	W	400000
Great Blue Lobelia	<i>Lobelia siphilitica</i>	W-M	500000
Monkey Flower	<i>Mimulus ringens</i>	W	2300000
Dotted Mint	<i>Monarda punctata</i>	D	90000
Foxglove Beardtongue	<i>Penstemon digitalis</i>	M	130000
Prairie Cinquefoil	<i>Potentilla arguta</i>	M-D	230000
Hairy Mt. Mint	<i>Pycnanthemum pilosum</i>	M-D	185000
Slender Mt. Mint	<i>Pycnanthemum tenuifolium</i>	M-D	378000
Common Mt. Mint	<i>Pycnanthemum virginianum</i>	W-M	220000
Prairie Ragwort	<i>Senecio platensis</i>	M-D	100000
Old Field Goldenrod	<i>Solidago nemoralis</i>	D	300000
Showy Goldenrod	<i>Solidago speciosa</i>	M-D	103600
Heath Aster	<i>Symphyotrichum ericoides</i>	M-D	200000
Silky Aster	<i>Symphyotrichum sericeum</i>	D	476000
Culver's Root	<i>Veronicastrum virginicum</i>	W-M	800000

Table 1. Small seeded tallgrass prairie species that can be broadcast seeded onto the surface without incorporating into the soil.

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References

- Packard, S. and C. Mutel. 1997. The tallgrass restoration handbook. Island Press. Washington, D.C.
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Roadsides: Living on the Edge



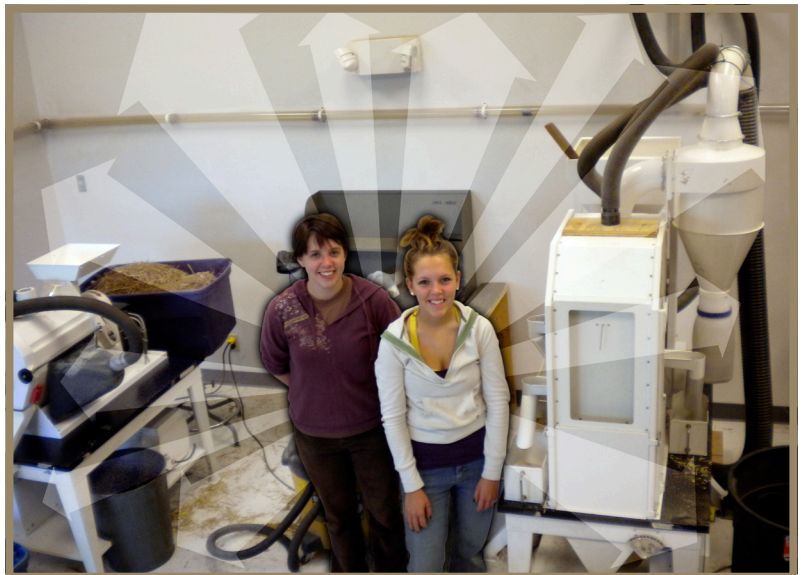
RVM 23rd Annual Roadside Conference

The theme for the 23rd Annual Roadside Conference was Living on the Edge, acknowledging the nature of roadside habitat as well as the workplace for the state and county employees who maintain our roadside vegetation. The meeting, September 24th and 25th at the Mason City Holiday Inn, attracted 130 attendees. Presentations included "Managing Roadsides for Wildlife" by Carmelita Nelson, Coordinator for Minnesota DNR's Roadside Wildlife Program and "Trends in Deer/Vehicle Collisions and Factors Influencing Their Occurrence" by Iowa DNR Deer Biologist, Tom Litchfield. Also presenting were Mark Renz of UW Madison on "Wild Parsnip Biology and Control" and Iowa DNR Private Lands Biologist, Greg Schmitt on "Habitat Programs for Adjacent Land". Cerro Gordo County's Integrated Roadside Vegetation Management program hosted the event, making them the 16th county to host a roadside conference. Conference participants each received a copy of the newly released 2nd Edition of Wildflowers of the Tallgrass Prairie. The conference was sponsored by a grant from the Living Roadway Trust Fund.

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Steve Krehbiel of Quick Supply Co. demonstrating erosion control materials for the Roadside Conference bus tour.



Hard working student employees, Molly Schlumbohm and Rachel Bench, pictured in the Tallgrass Prairie Center's Seed Cleaning Lab.

Onward and Upward... Student Employees Graduate to Next Level

The Tallgrass Prairie Center wishes the best of luck to our graduating student employees, Molly and Rachel. We greatly appreciate all of their hard work and positive energy.

Molly Schlumbohm, B.S. Earth Science - Interpretive Naturalist 2009, has applied to graduate school at UNI and is interested in environmental technology. Rachel Bench, B.A. Biology - Ecology and Systematics 2009, is looking forward to getting married in January. She plans on spending the Spring applying to graduate schools and graduate assistantship.

We want to thank our students for their help and input on many projects at the Tallgrass Prairie Center.

Can You Identify this Seedling



Photo credit: Dave Williams

Key characteristics: flattened tiller base, leaf margin hairs swollen at their base, hairs present on tiller and leaves, and emergent leaf rolled.

Answer below ➡

Bouteloua curtipendula
Side-oats grama