Creating Prairie Meadow Ecosystems as the New American Lawn

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Abstract

Lawn and Prairie are two different landscape and social models. Whereas lawn can only be maintained through high input of water, chemicals, and labour, Prairie meadows require no fertilizers or fungicides, and few if any herbicides. A properly established and maintained prairie meadow is a self-sustaining plant community that will provide landscape beauty for decades to come. The prairie grasses and flowers create high quality habitat for birds, butterflies, and other wildlife. The deep-rooted prairie plants encourage infiltration of rainwater into the soil, thus reducing stormwater runoff and flooding. Prairies can also serve as buffer strips between maintained turf and wetland areas, such as ponds, waterways, and marshes. They require only annual mowing or burning once established.

LAWN AND PRAIRIE: TWO DIFFERENT LANDSCAPE AND SOCIAL MODELS

Lawn has been the universal, socially acceptable landscape in America for over a century. The national obsession with this two dimensional, chemically addicted, ecological wasteland has come under question in the last three decades. The average American lawn receives four times as much pesticides and fertilizers as the typical farm field. The application of chemicals on lawns is contributing to problems with water quality, as well as concern over other environmental health issues. For people who wish to reduce their landscape's dependency on chemicals, and save time and money on maintenance, there is an alternative. It is the American Prairie.

This new naturalistic style of landscaping in the USA has grown out of the environmental movement of the last thirty years (Sale and Foner 1993). As people sought alternatives to the conventional lawn, prairie landscapes became a viable option (Daniels 1995, Craig and Loewer 1995). Prairie meadows require no fertilizers or fungicides, and few if any herbicides. The initial costs of a prairie seeding are often a little higher compared to turf seedings, but significant long term savings result due to greatly reduced maintenance requirements. Initial costs are usually recovered by the second year. Maintenance savings continue to accrue in following years, yielding very low "life cycle" costs for prairie meadows. Because native prairie flowers and grasses are almost exclusively perennials, they bloom year after year.

We use the natural prairies of the Midwestern United States as a design model, applying concepts of their natural plant ecology. Native grasses are mixed with prairie wildflowers to create a landscape with year-round interest. The dense fibrous root systems of grasses help to keep out weeds and to support wild flowers. Roots of the flowering plants grow between clumps of grass, and draw moisture and nutrients from lower soil level. Flowers and grasses form a long-lived, stable, and ecologically sustainable plant community. This concept of creating plant communities, rather than gardens, is the central tenet of landscaping with native American prairie plants. This grassland ecosystem supports a wide diversity of life forms including insects, small mammals, reptiles, amphibians, songbirds, hawks, owls, and other predators.

The prairie flowers bloom from early summer into the fall to create a floral extravaganza during the summer temperature of 40 °C and higher (Figure 1). The heat-loving prairie grasses send up seed stalks in late summer, which turn brilliant copper, red, and gold with the first frosts of autumn. This creates a fall and winter landscape composed of warm colours to liven up the landscape where temperatures can plunge to –

40 °C. These are very tough plants, evolved under the extreme conditions of the North American continental climate.

DESIGNING PRAIRIE GARDENS

Designing prairie gardens and meadows is both an art and a science. For areas up to few hundred square meters, live transplants are used. The plants can be placed in specific locations in combinations to create a desired effect, as with traditional gardening. Care is taken to plant with regard to natural association, according to the soil type, drainage, and sunshine requirements. Prairie gardens can be allowed to evolve naturally , or the original garden design can be maintained by weeding, mulching, and other methods of maintenance.

In small urban spaces where immediate landscape effect is required, establishing prairie gardens from transplants is preferable (Figure 2). Seeded meadows require three to five years to fully develop (Figure 3), and in the first two years annual and biennial weeds typically dominate, often resulting in poor public acceptance.

DESIGNING PRAIRIE MEADOWS

Establishing a prairie meadow is much more complex than planting a prairie garden. The garden uses established plants, each planted in a specific location and requires on-going maintenance. The prairie meadow is established from seed and requires many years to reach maturity. There may be losses due to poor weather, weed competition, damage by insects and animals, and other causes. Once ecological factors (Table 1) have been evaluated, a specific Prairie Establishment Implementation Plan (Table 2) can be developed to match the specific site conditions.

Site Selection

Prairie plants are adapted to open sunny sites; poor air circulation can lead to fungal disease infection. They require full sun for at least half of each day, especially if the soils are wet or heavy. Good candidates for seeding to prairie meadows include areas presently in turf, cornfields, soybean fields, and alfalfa fields. There should be no residual herbicide activity.

Areas with a history of heavy weed growth should be avoided. Beware of planting meadows in locations with adjacent weedy vegetation that cannot be eliminated, or controlled by mowing before the weeds produce seed.

Site Preparation

This is a critical and commonly neglected step. All existing vegetation must be killed prior to seeding. For example it takes only a few rhizomes of quackgrass (*Elytrigia repens*), or Canada goldenrod (*Solidago canadensis*) to quickly re-colonize the planted area. Different methods of preparing a site for seeding to a prairie meadow are presented in Table 3.

Up to two years of site preparation may be required to control weeds. On most sites, a full season of treatment with Roundup (Glyphosate) herbicide is effective, spraying the weeds every six to eight weeks from late May through mid-September. On slopes, a temporary cover crop, such as oats or annual rye, must be planted in spring to stabilise the soil. before being similarly treated with Roundup.

One of the main goals when planting a prairie meadow is to eliminate treatment with chemicals in the landscape. However, most landscape restorationists in North America (Personal Communication with Land Stewards in The Nature Conservancy, and Natural Areas Managers in state Departments of Natural Resources and Conservation) accept the use of Roundup herbicide as a necessity in achieving the greater goal of successfully establishing a prairie meadow. The organic method of weed control, which will typically eliminate almost all perennial weeds, involves a two year buckwheat and winter wheat “smother crop” rotation.

Plant Selection

In a well-tended garden, plants can be grown in situations in which they might never be found in nature. However, prairie seeds will receive little assistance in their struggle for survival and it is essential to select plants amenable to the specific site conditions.

The prairie is a grassland ecosystem composed of 50% to 90% grasses, which play a central role. Total amount of seed of grasses and wild flowers must be specified to achieve the desired landscape effect (Table 4). It is critical not to include too much seed of aggressive species, such as certain taller prairie grasses and rapidly-spreading rhizomatous flowers.

Most prairie meadow seed mixes contain approximately a 2:1 ratio of grass seed to flower seed by weight. However, due to the smaller average size and weight of flower seeds, the ratio of grasses to flowers in terms of seeds per area is usually 1:1 and can be as low as 1:3. Many prairie seed mixes contain far more flower seeds than grass seeds, to ensure that the flowers become well established at the outset. Certain prairie grasses gain in strength over decades, often reducing the density of certain flowers. Examples of prairie seed mixes are shown in Tables 5 to 7.

Because the prairie seedings receive no weeding or other care normally associated with a garden, there is significant mortality. The goal is to achieve between one and three mature plants per square foot after three years. At a typical seeding rate of 540 seeds per square meter, this implies a germination and seedling survival rate of 2 to 6 %.

Prairie flowers and grasses are generally grouped into two categories: Short Prairie (15 cm to 1.5 m), Tall Prairie: (1.5 m to 4 m). Short prairie plants are the best choice for smaller, urban spaces, except where big, bold plants are desired to create a special effect. Tall prairie plants are best used in large open areas, behind a short prairie meadow, or against a woodland edge. When designing a prairie meadow for areas of one half hectare or larger, short and tall prairies can be used in combination, which greatly increases the biodiversity and ecological value of the land.

Planting Time and Method

Time of planting can have a large influence on both the structure and success of a prairie meadow. Prairie seeds can be successfully planted during the spring, from spring thaw to June 30, or in autumn, from September 1 until soil freeze-up (Dormant Seeding). Fall seedings typically have higher germination rates for wild flowers but lower rates for prairie grasses. The opposite is true for spring seedings due to the fact that many prairie flowers require exposure to a period of cool, damp weather to break dormancy.

Fall seeding is strongly recommended for dry, sandy and gravelly soils, to encourage seed germination and survival in early spring when soil moisture is available. Clay soils give earlier seedling germination from fall seedings, since they are often wet in spring and hard to cultivate. The problem with soil penetration during summer drought is particularly pronounced in clay soils. The small seedlings develop deeper root systems prior to the onset of summer drought, so that there are fewer losses.

Planting prairie seeds can be accomplished by a variety of methods: by the use of a no-till seeder (such as Truax and Tye) for multi-acre plantings; by broadcast seeder (such as the Brillion double box agricultural model) or by hand broadcast for small areas. No-till plantings minimize soil disturbance and typically result in less weeds. Broadcast seeders require soil tillage prior to planting, but provide excellent seed to soil contact.

Erosion-prone sites should be planted with a nurse crop and covered with weed-free straw mulch (winter wheat straw is best) to prevent seed and soil loss. Steep slopes and areas subject to water flow should be protected with erosion blankets, selected to match the expected water volumes and velocities. Fall planting on erodible sites should be completed by Sept 15 in order to encourage sufficient growth of nurse crops to stabilize the soil. Native wildflowers and prairie grasses require firm contact with the soil for good germination. Attempts to establish prairie meadows using hydro-seeding have typically resulted in poor results and this method is not recommended.

POST-PLANTING MANAGING PROCEDURES

A prairie is a low maintenance landscape requiring minimal but specific, care. In the first two years, annual and biennial weeds will grow much faster than the perennial native plants. In the third growing season, the wildflowers and grasses should outpace weed growth and many will reach maturity.

Maintenance costs for a prairie are often a fraction of those for a garden or lawn. Prairie maintenance in the first year ideally consists of watering the seeded area for the first two months of spring (April 15 to June 15). Regular watering greatly increases seed germination and seedling survival. However, most prairie meadows receive no irrigation, in order to maximise the cost savings. Today, we manage prairie meadows using four basic methods: mowing, controlled burning, grazing (e.g. bison, elk, antelope), and selective herbicides for spot treatment of problem weeds. Mowing and controlled burning are the primary options for managing the prairie. These can be conducted on a large scale at a low cost. Problem weeds can be controlled by careful spot application of selective herbicides.

Annual weeds will dominate the prairie seeding in the first growing season and when weeds grow to a height of 35 cm they must be mowed to 15 cm. This allows light to reach the small, slow-growing prairie seedlings. The meadow usually requires mowing three times in the first growing season (compared to ten times or more for a lawn). No fertilizers are applied to the prairie meadow because seedlings require relatively low levels of nitrogen and other nutrients, which also stimulate weed growth.

In the second year, biennial weeds can reach a height of 2 m and must be mowed to 25 cm. Most of the perennial prairie plants will still be less than 25 cm tall in the second year and are not harmed by this mowing.

In the spring of the third year, the prairie is burned to the ground, if possible. This helps prevent invasion by trees and shrubs, as well as controlling undesirable cool season weeds and grasses, such as *Elytrigia repens, Poa pratensis, Bromus inermis, Festuca* spp., *Trifolium* spp. Cool season plants have a significant advantage over the predominantly warm-season prairie plants because they begin growth four to six weeks earlier. Burning in mid-spring, therefore damages the new growth of competitors weakening their root reserves. The soil is exposed and blackened by burning, so that it is warmed rapidly by the sun, shifting the competitive balance in favor of the heat-loving prairie plants. Burning is the most important tool for controlling unwanted plants and encouraging maximum growth of the prairie plants.

Native Americans (Indians) used fire as a tool to manage the prairie for centuries before the advent of Europeans in the Americas. Geographic range of the prairie grasslands in North America was greatly expanded by this activity but when burning was stopped by the early settlers in the American West in the 19th century, trees soon invaded the prairies.

If burning is not an option due to air quality or safety concerns, the prairie can instead be mowed closely, down the soil surface. The cut material is then raked off to expose the soil, to encourage soil warming. Diboll (1984) demonstrated that mowing and raking is approximately 65% as effective as burning in controlling undesirable cool season grasses. Visually, a mowed and raked prairie is usually indistinguishable from a burned prairie.

CONCLUSIONS

Establishing a native prairie meadow is not a simple process. When used in the right setting, properly designed and managed prairie gardens and meadows are an ecological alternative to the ubiquitous and often purposeless lawn. Meadows that are designed to properly fit the available space can provide dynamic, changing landscapes reflecting the moods and rhythms of nature. More and more people in North America are planting prairie meadows instead of lawns. A prairie lives on year after year, and serves as a living legacy of the person who plants it. The intrinsic natural beauty, ecological

value, and significant maintenance savings make prairie meadows a very attractive landscape option.

The prairie is far more than just another landscape. It is an ongoing, life-long, life-affirming experience. It is a true meeting of people and nature in the garden. The New American Lawn is now emerging from the Old American Prairie.

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Tables

Table 1. Evaluation of the ecological factors of the future prairie meadow site.

Factor	Description
Soil Type	Sand, Loam, Clay, Rock, Peat, etc
Soil Drainage	Dry, Medium, Wet
Soil Porosity and Structure	Dry, Moist, Normal
Sunlight	Prairies require full or nearly full sun
Slope Aspect and Microclimate	North, South, East, West
Erosion Potential	Combination of soil type and steepness of slope
Existing Vegetation	Weeds, Grasses, Lawn, etc
Adjacent Weed Sources	Invasion by wind-blown seeds from nearby weeds

Table 2. Prairie Establishment Implementation Plan.

Phase	Description
Site selection	Sunny, well-ventilated, with low weed densities
Plant selection	Seed mix specification. Match plants to the soil and growing conditions.
Site Preparation	Eliminate ALL weeds and competing vegetation
Planting Date	Fall versus Spring
Planting Method	Mechanical, Hand Broadcast, etc
Erosion Control Plan	Straw Mulch, Erosion Blanket, etc, if necessary
Post Planting Management	Mowing, Burning, Spot Weed Treatment

Table 3. Methods for eliminating weeds and competing vegetation.

Method	**Time required**
Sod removal, using a sod-cutter (for lawns with no weeds)	-
Smothering with black or clear plastic (for small areas)	full growing season (1-8 months, depending upon vegetation type)
Repeated deep soil tillage every three weeks	full growing season
Smothering with thick layers of leaves or grass clippings	full growing season
Planting a summer buckwheat smother crop, followed by fall planting of winter wheat	up to two years
Herbicide treatment using Roundup or similar glyphosate herbicide	from single treatment up to two years

Table 4. General range of seed mix contents

	Total (Flower and Grass)	Grasses	Flowers
Species number	15 - 50	3 - 10	12 – 40
Seed weight (kg/ha)	1.12 - 1.68	0.56 - 1.12	0.22 - 0.56
Seed numbers (seeds/m^2)	430 – 1290	160 - 430	270 – 860

Table 5 An example of North American prairie seed mix for dry soils for 1000 square meters (seeding rate: 600 seeds per square meter). The mix is composed of 50% forbs and 50% grasses in terms of seeds per square meter.

	Common Name	Seeds per gram (N / g)	Seeds required (g/1000 m^2)	Seeds required (N / m^2)
Forbs				
Agastache foeniculum	Lavender Hyssop	2300	5.2	12.0
Amorpha canescens	Leadplant	600	20.0	12.0
Asclepias tuberosa	Butterflyweed	120	100.0	12.0
Aster azureus	Sky Blue Aster	2900	4.1	12.0
Aster laevis	Smooth Aster	1700	7.1	12.0
Aster ptarmicoides	White Aster	2500	2.4	6.0
Astragalus canadensis	Canada Milk Vetch	560	10.7	6.0
Baptisia bracteata	Cream False Indigo	55	109.1	6.0
Cassia fasciculata	Partridge Pea	245	24.5	6.0
Coreopsis lanceolata	Lanceleaf Coreopsis	440	13.6	6.0
Dalea candida	White Prairie Clover	530	11.3	6.0
Dalea purpurea	Purple Prairie Clover	700	17.1	12.0
Echinacea pallida	Pale Purple Coneflower	175	68.6	12.0
Helianthus mollis	Downy Sunflower	270	5.6	1.5
Helianthus occidentalis	Western Sunflower	460	3.3	1.5
Kuhnia eupatorioides	False Boneset	845	3.6	3.0
Lespedeza capitata	Roundhead Bushclover	350	17.1	6.0
Liatris aspera	Rough Blazingstar	475	37.9	18.0
Lupinus perennis	Wild Lupine	35	514.3	18.0
Monarda punctata	Dotted Mint	3300	1.8	6.0
Monarda fistulosa	Bergamot	2700	2.2	6.0
Penstemon grandiflorus	Beardtongue	390	30.8	12.0
Ratibida pinnata	Yellow Coneflower	950	12.6	12.0
Rosa carolina	Pasture Rose	100	60.0	6.0
Rudbeckia hirta	Black Eyed Susan	3500	8.6	30.0
Ruellia humilis	Wild Petunia	140	85.7	12.0
Solidago rigida	Stiff Goldenrod	1600	7.5	12.0
Solidago speciosa	Showy Goldenrod	3700	3.2	12.0
Tradescantia ohiensis	Ohio Spiderwort	280	42.9	12.0
Verbena stricta	Hoary Vervain	1130	10.6	12.0
Grasses				
Andropogon gerardi	Big Bluestem	290	62.1	18.0
Bouteloua curtipendula	Side Oats Grama	280	214.3	60.0
Elymus canadensis	Canada Wild Rye	150	120.0	18.0
Koeleria macrantha	Junegrass	5300	9.1	48.0
Schizachyrium scoparium	Little Bluestem	310	309.7	96.0
Sorghastrum nutans	Indiangrass	290	103.4	30.0
Sporobolus heterolepis	Prairie Dropseed	490	61.2	30.0

Table 6. An example of North American prairie seed mix for wet soils for 1000 square meters (seeding rate: 1000 seeds per square meter). The mix is composed of 50% forbs and 50% grasses and sedges in terms of seeds per square meter.

Latin Name	Common Name	Seeds per gram (N / g)	Seeds required (g/1000 m^2)	Seeds required (N / m^2)
Forbs				
Allium cernuum	Nodding Pink Onion	270	37.0	10
Angelica atropurpurea	Angelica	230	43.5	10
Asclepias incarnata	Red Milkweed	155	64.5	10
Aster novae-angliae	New England Aster	2400	4.2	10
Aster puniceus	Purple Stem Aster	2800	3.6	10
Cacalia atriplicifolia	Pale Indian Plantain	225	44.4	10
Cassia hebecarpa	Wild Senna	50	200.0	10
Coreopsis tripteris	Tall Coreopsis	400	25.0	10
Eupatorium maculatum	Joe Pye Weed	3000	6.7	20
Eupatorium perfoliatum	Boneset	7000	1.4	10
Gentiana andrewsii	Bottle Gentian	28000	0.7	20
Helenium autumnale	Sneezeweed	3500	2.9	10
Heliopsis helianthoides	Ox Eye Sunflower	230	43.5	10
Hypericum pyramidatum	Great St. Johnswort	7700	1.3	10
Iris shrevei	Wild Iris	50	400.0	20
Iris versicolor	Blue Flag Iris	50	400.0	20
Liatris pycnostachya	Prairie Blazingstar	420	47.6	20
Liatris spicata	Dense Blazingstar	420	47.6	20
Lilium superbum	Turk's Cap Lily	240	41.7	10
Lobelia cardinalis	Cardinal Flower	10000	2.0	20
Lobelia siphilitica	Great Blue Lobelia	16000	1.3	20
Monarda fistulosa	Bergamot	2700	3.7	10
Penstemon digitalis	Smooth Penstemon	3500	2.9	10
Physostegia virginiana	False Dragonhead	440	22.7	10
Ratibida pinnata	Yellow Coneflower	950	10.5	10
Rudbeckia laciniata	Green Headed Coneflower	520	19.2	10
Rudbeckia subtomentosa	Sweet Black Eyed Susan	1600	6.3	10
Rudbeckia triloba	Branched Coneflower	1100	9.1	10
Silphium perfoliatum	Cupplant	50	200.0	10
Silphium terebinthinaceum	Prairie Dock	40	250.0	10
Solidago ohioensis	Ohio Goldenrod	3150	3.2	10
Thalictrum dasycarpum	Meadowrue	490	20.4	10
Verbena hastata	Blue Vervain	3500	2.9	10
Vernonia fasciculata	Ironweed	700	14.3	10
Veronicastrum virginicum	Culver's Root	26000	2.7	70
Zizia aurea	Golden Alexanders	420	23.8	10

Table 6. continued

	Common Name	Seeds per gram (N / g)	Seeds required (g/1000 m^2)	Seeds required (N / m^2)
Grasses & Sedges				
Andropogon gerardi	Big Bluestem	285	175.4	50
Calamagrostis canadensis	Bluejoint Grass	21000	3.3	70
Carex comosa	Bottlebrush Sedge	845	35.5	30
Carex hystericina	Porcupine Sedge	1270	23.6	30
Carex scoparia	Awl Fruited Sedge	4'200	11.9	50
Carex vulpinoidea	Fox Sedge	3175	12.6	40
Elymus canadensis	Canada Wild Rye	145	344.8	50
Elymus virginicus	Virginia Wild Rye	135	296.3	40
Glyceria striata	Fowl Manna Grass	6350	6.3	40
Scirpus atrovirens	Dark Green Bulrush	4930	14.2	70
Spartina pectinata	Prairie Cordgrass	315	95.2	30

Table 7. An example of North American prairie seed mix for mesic soils for 1000 square meters (seeding rate: 600 seeds per square meter). The mix is composed of 50% forbs and 50% grasses and sedges in terms of seeds per square meter. The most commonly used prairie seed mixes are planted on mesic soils.

	Common Name	Seeds per gram (N / g)	Seeds required (g/1000 m^2)	Seeds required (N / m^2)
Forbs				
Agastache foeniculum	Lavender Hyssop	2300	2.6	6
Allium cernuum	Nodding Pink Onion	270	33.3	9
Asclepias tuberosa	Butterflyweed	120	100.0	12
Aster azureus	Sky Blue Aster	2900	2.1	6
Aster laevis	Smooth Aster	1700	3.5	6
Aster novae-angliae	New England Aster	2400	2.5	6
Astragalus canadensis	Canada Milk Vetch	560	10.7	6
Baptisia australis	Blue False Indigo	55	109.1	6
Baptisia lacteal	White False Indigo	55	109.1	6
Boltonia asteroides	False Aster	7000	0.4	3
Cassia hebecarpa	Wild Senna	50	60.0	3
Coreopsis lanceolata	Lanceleaf Coreopsis	440	13.6	6
Dalea purpurea	Purple Prairie Clover	700	17.1	12
Desmodium canadense	Canada Tick Trefoil	160	37.5	6
Echinacea pallida	Pale Purple Coneflower	175	68.6	12
Echinacea paradoxa	Ozark Coneflower	250	24.0	6
Echinacea purpurea	Purple Coneflower	230	26.1	6
Eryngium yuccifolium	Rattlesnake Master	280	21.4	6
Gentiana flavida	Cream Gentian	8400	1.4	12
Helianthus laetiflorus	Showy Sunflower	160	9.4	1.5
Heliopsis helianthoides	Ox Eye Sunflower	230	6.5	1.5
Lespedeza capitata	Roundhead Bushclover	350	17.1	6
Liatris ligulistylis	Meadow Blazingstar	460	26.1	12
Liatris pycnostachya	Prairie Blazingstar	420	28.6	12
Monarda fistulosa	Bergamot	2700	1.1	3
Parthenium integrifolium	Wild Quinine	240	25.0	6
Penstemon digitalis	Smooth Penstemon	3500	3.4	12
Polygonatum canaliculatum	Great Solomon's Seal	40	150.0	6
Ratibida pinnata	Yellow Coneflower	950	12.6	12
Rosa blanda	Meadow Rose	135	44.4	6
Rudbeckia hirta	Black Eyed Susan	3500	8.6	30
Rudbeckia subtomentosa	Sweet Black Eyed Susan	1600	3.8	6
Rudbeckia triloba	Brown Eyed Susan	1100	5.5	6
Silphium integrifolium	Rosinweed	140	21.4	3

Table 7 continued

	Common Name	Seeds per gram (N / g)	Seeds required (g/1000 m^2)	Seeds required (N / m^2)
Silphium laciniatum	Compassplant	23	130.4	3
Silphium terebinthinaceum	Prairie Dock	40	75.0	3
Solidago rigida	Stiff Goldenrod	1600	3.8	6
Solidago speciosa	Showy Goldenrod	3700	1.6	6
Tradescantia ohiensis	Ohio Spiderwort	280	42.9	12
Verbena stricta	Hoary Vervain	1130	5.3	6
Zizia aptera	Heartleaf Golden Alexanders	300	20.0	6
Grasses				
Andropogon gerardi	Big Bluestem	290	62	18
Bouteloua curtipendula	Side Oats Grama	280	214	60
Elymus canadensis	Canada Wild Rye	150	120	18
Pa1nicum virgatum	Switchgrass	635	9	6
Schizachyrium scoparium	Little Bluestem	310	387	120
Sorghastrum nutans	Indiangrass	290	103	30
Sporobolus heterolepis		490	98	48

Figures

Fig. 1. The Lentz family created low maintenance prairie gardens in the dry sandy soil of their front yard using transplants of many different prairie flowers and grasses. In mid-July, these plants flower abundantly despite temperatures as high as 40 ° C.

Fig. 2. "The Wilmot Elementary School in Deerfield, Illinois (USA) replaced its front lawn with a prairie garden. Transplants were installed in groups and combinations, similar to a traditional garden design. The garden provides year round color and interest, as well as habitat for birds, butterflies, and a wide variety of invertebrates. Plants include *Echinacea purpurea*, *Liatris pycnostachya*, *Eupatorium maculatum*, and *Silphium perfoliatum.* .

Fig. 3. Doctor Rodney Sturm replaced his suburban lawn on the side of his house with a North American prairie using a seed mix composed a five prairie grasses and over twenty prairie flowers. His specific goal was to create habitat for birds. This is the effect in late July of the third growing season, with *Rudbeckia hirta*, *Ratibida pinnata* and *Monarda fistulosa* dominant.