A WATER WISE LAWN

In Saskatchewan, it is not possible to grow a Kentucky blue grass lawn without irrigation. One grass that should be considered for hot and dry areas, is blue grama *(Bouteloua gracilis*), a native grass of the prairies. Blue grama only grows 150-200 mm (6-8 in.) high, doesn't need fertilizer and doesn't require water to stay green in a normal precipitation year.

Unmown blue grama in September

An opportunity presented itself in our own front yard when we had our weeping tile replaced in 2015. The construction left the yard devoid of lawn and we were able to start over. In 2016, we reseeded one area with a common mix of fine fescue grasses and the other with blue grama. We chose blue grama because it was first and foremost a native grass, easy on bare feet, seed was available, and it was drought tolerant saving money on water bills. Mat muhly (*Muhlenbergia richardsonis*) was also considered, but the seed was difficult to source and would need more watering. Buffalo grass was too grey and we had read it was not kind to bare feet though this has not been substantiated. June grass *(Kohleria macrantha)*, was also a possibility. I wanted to find out why blue grama was not being used more often and how it compared to the common fine fescue grasses. I also wanted to know how we can make native grasses more palatable to the ordinary citizen. I had visited a number of prairie gardens[(8)] and done a test plot of blue grama and June grass a few years earlier. I decided that the warm season blue grama grass looked dead mixed in with the June grass, a cool season grass, and this affect lasted a good month. The committed environmentalist might not be fazed, but the ordinary homeowner would likely not be convinced. Therefore, a single grass was chosen. Mixing cool and warm season grasses could possibly be used in creative ways creating a pattern in early spring (such as stripes) from the green (cool season) and yellow (warm season) grasses.

A blue grama lawn is not for everyone - is it for you?

If you want to be the first one with a green lawn blue grama is definitely not for you. This is a warm season grass which means it will green up a full month after everyone else's lawn. This is what we like about it. We get to spend time in our perennial beds, pot up the annuals and seed the vegetable garden and avoid four week's worth of cutting grass. Is your lawn 'play central'? If so, Kentucky blue grass (KBG) is definitely a better choice for the wear and tear of a playing field. Blue grama is technically a clump forming grass and its ability to repair through rhizomes limited. Is your lawn in shade? Then choose fescue grasses since blue grama will die in shade. Is your lawn irrigated or in an area that is flooded? Nope - not for you. It will die if over watered. Do you need an instant lawn, one that will look lush and green in time for Aunt Sally's visit? Sorry - no – this is like fast food and slow food. It takes 2-3 years for this lawn to look good. Native grasses spend the first year sending down roots rather than looking good above ground. But you can buy plugs or potted plants if you had the money. Seeding the fine fescues also takes about 2 years and, in that regard, blue grama is not much different, but has substantially better drought resistance. Add another year if your soil is weed infested.

May 5: blue grama grass (a warm season grass) still dormant and non-native fescue (cool season) already green. It will remain dormant until the beginning of June.

July 14, 2016 blue grama newly germinated after a second seeding. Some spotty parts in shady areas were reseeded.

So why grow it?

First and foremost, it is a grass that has been here for over 10,000 years(1). To say it understands the Saskatchewan environment would be an understatement. It knows how to deal with climate-change. The roots will eventually go down 1 to1.8 metres(2) and this gives me calm in the face of a drought. We save money not watering or fertilizing. It has done well in our clay soil, though many articles suggest it prefers a drier or sandy loam environment to do really well. It is beneficial for seed eating birds. Scientists have determined 13 butterfly larvae feed on blue grama, including, skippers and wood nymphs(3). Because it's a native grass it will not create an environmental headache should its seeds spread via birds. Its seed heads are beautiful in spring and winter. We found out by accident that when we leave the blue grama lawn uncut for the winter this is the perfect overwintering ground for ladybugs. After an elm aphid infestation, we had swarms of ladybugs in the dead standing grass the next spring. Certainly enough ladybugs to self correct the sticky aphid honeydew problem of the year before, a natural approach to infestations.

Mistakes:

We were impatient and did not sow a nurse crop to remove the weeds the first year. This turned out to be an error and much weeding was done by hand. We planted in early spring, but the seed did not germinate. Later, I found that nighttime temperatures should be above 10-16 degrees

Celsius. We seeded a second time and then watered every day for about 1 week to keep the soil level continuously moist for a 4-5 day period. After that we watered about once a week for the next 3 weeks and then not at all. I was more worried about over watering. Our lawn was quite thin in 2017 when we had the 100 year Regina drought. We watered for about 10-15 minutes 3-4 times that summer. We didn't want it to go dormant and that is all it took to keep it looking green. In a work landscape related project, the grass went to seed in the first year, but I now know the conditions must have been perfect. It germinates quickly, but then takes a few years to look good.

Mowing:

Last year we mowed 3 times; the last mowing being mid-July. We wanted to let the beautiful seed heads form for winter interest and seed eating birds on fall migration and for overwintering bugs. The grass height with seed heads is about 12-14" high. This year it looks like we will mow only once. It is so dry this year; we feel mowing will put more stress on the elms tree next to this area. There is a bit of sage in the mix, which we like so we have left it. Last year we planted plugs of native harebell. We want pollinator plants in the grass, but we want them to be low varieties and native. We are excited to see what happens, but doing so has forced us to mow earlier or we would cut the flowers. If we had a sandier soil, crocus might be a better choice. You would then mow quite late after the crocus seed heads had gone to seed. Crocus requires well-draining sites, not ideal for the clay Regina area. In a mown state few people would be able to tell that blue grama was any different than any other turf grass, though it is much finer. There is always some yellow showing from the previous year's stems and thatch.

Weeding:

In the spring I weed out the obviously green Kentucky blue grass and the dandelions when it is easy to see against the yellow blue grama. There are fewer dandelions because there is no irrigation and if left unmown harder for the dandelions to germinate since the seed needs light to germinate. Does it look messy? The seed heads stay upright for the winter, though the grass in our partly shady yard flops a bit. In drier locations it is more upright. And if we had planted the grass as individual spaced plants we would have had more of an ornamental grass look.

Why grass instead of stone?

What I have noticed is few people are implementing native plant concepts in their yards. Instead, there is a disquieting trend with the extensive use of stone, and for those who can afford it artificial lawns. Almost every street has at least a few gravel front yards, but using native grasses is a rare find. Stone and synthetic lawns absorb heat and do not mitigate carbon emissions. They are not the destination of choice for birds, butterflies and bees – its ecosystem services[4] left wanting. Both the filter fabric required underneath stone and the synthetic lawn will eventually find itself in the landfill. If you want to be a good steward of the property you own, stone has few checkmarks, the main advantage being less water. Blue grama or blue grama in combination with buffalo grass uses 78% less water than a traditional lawn[5]. Besides deep roots, it also has shallow roots[2] that takes advantageous of the slightest bit of rain turning the grass green. We have watered not because the grass needs it, but because we worry about the elm tree beside it. In treed lots, stone needs to be vacuumed or the leaf litter will eventually turn into soil, attracting weeds. Fine weed roots eventually get through the fabric and become difficult to remove. Now you are using pesticides to remove the weeds.

What if I have an acreage?

In larger lawn applications, it's best to choose a mix of native grasses. Nora Stewart, author of "Cultivating Our Roots- growing authentic prairie wildflowers" recommended using shorter varieties [7]. In rainy years the wheat grasses increase and in drought years the blue grama spreads. Across from Candy Cane Park is a native grass mix, seeded in the late fall of 2007. Few people know it's there. The seed mix consists of 5 grasses: northern and western wheatgrass, plains rough fescue, June grass and blue grama. After Regina's 100 year drought of 2017-2018 I went to look at it and was disappointed. It looked just as yellow as all the other grasses native or not. But disappointment was short lived. In 2019 when moisture levels improved, the blue grama showed its resilience. The seed heads were just as tall as the neighbouring crested wheatgrass which clearly exhibited stress in its thinned and low stature. Meanwhile, in some areas of the city, some fine fescue lawns had died for lack of water.

Left: After a drought, blue grama seed heads match the height of crested wheat grass. In a normal precipitation year the crested wheat grass would be twice as tall.

Below: Blue grama seed heads dominate after the 2017-2018 drought showing its resilience when the rains return.

Both photos taken Aug. 27 2019.

Blue grama and other native grass lawns and roadside and park applications are used extensively throughout the USA and research documents abound online. These grasses can be found as far south as Mexico and California and are also recorded in places like Idaho and New York. But don't plant blue grama that was grown that far south / east or west. It would not survive even though technically it's the same grass. The general rule is to find a seed source within 100 km north or south and 200 km east or west. Many of the USA information sources suggest ideas that may be worthy of trial here. For example I have read in a Maryland university study, that trials in Virginia using a combination of blue grama and buffalo grass in road side plantings had excellent outcomes against weed encroachment[6].

2021 is proving to be another very dry year in Regina. A visit to the native plantings across from Candy Cane Park confirmed my position. Over a period of 12 years the native grasses continue to show resilience. They need more consideration and use. Many would outright reject the blue grama if reviewing only the early spring photos of May and June, but the tables are turned when you review the grass during a drought year. The photos below prove my point.

Top yellow: crested wheat grass

Middle green, un-irrigated: 5 shorter native grass varieties including blue grama;

Yellow foreground: Un-irrigated fescue; there may be some Kentucky blue grass

Green foreground: irrigated, likely a fescue/ Kentucky blue grass mix

Photos taken July 19, 2021: Crested wheat grass (yellow) next to native mix (green); the photos have been taken in generally the same area looking in both directions. The grasses are not irrigated and have been mowed. It has been 5 weeks since we have had a decent rain fall in the Regina area.

Smooth brome and crested wheatgrass were often planted in the past for large swaths of park space. The seed may be inexpensive, germinate well but this short-term gain is no match for native grasses and their long-term results. What may be a good agricultural forage crop has proven to be a very poor lawn alternative for our parks and open spaces and an uninteresting park experience for the user. These introduced grasses create taxpayer expense when they are mowed, fertilized and their aggressive nature invade our native ecosystems where they are removed as invasive in our provincial and federal parks.

The role of herbaceous plants

If possible, consider including inexpensive forbs such as purple prairie clover, blue flax and ratibida. These have a role to play in the dynamics of the ecosystem you are creating. They will ward off weeds, fix nitrogen or improve pollinator habitat. If some areas are left uncut we would have a park experience that included bees, butterflies and bugs and more reason for birds to show up. In a home yard the forbs can be placed around the perimeter of the grass in perennial beds. A reminder that in the lawn planting featured earlier, the intent is to explore how one can make a native lawn more desirable to the general public / home owner, so we have more uptake of native grasses rather than gravel lawns. This is why a single species was used in the project.

If native grasses are so good why don't we see more of them?

We have already mentioned it takes 2-3 years. Weed control may add another year. Some grasses, such as native fescues which can be difficult to get established. At one conference, a researcher even tried installing them as plugs rather than seed. June grass is stunning, but some articles indicate it can be short lived in clay soils. It is therefore important that June grass be allowed to self seed. Unfortunately, many native plantings have been tried without sufficient research or experience specific to native grasses. Hydro-seeding is generally not successful. Some native plants are short-lived thus the seed mix needs to be considered. Weeds invade in the early years and the result is a weedy mess giving native plants a bad rap. Groundskeepers are hesitant to try again. On large projects expert advice is essential to formulate mixes, check viability of seed and to be able to identify species when they germinate. On home projects there is more flexibility for error. What is lost is time. Though native seed is expensive compared to common grass seed, it is a bargain price compared to the cost of shrubs, perennials, mulch, filterfabric and stone.

The beautiful seed heads of June grass; Blue grama is in the back.

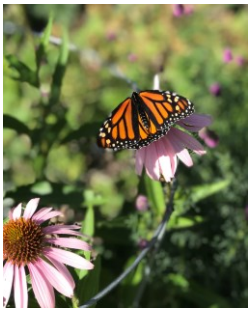
Conclusion:

One can understand that home owners want alternatives to watering, fertilizing, mowing, and using pesticides on their Kentucky blue grass lawns. There are many solutions. Using native grasses of Saskatchewan is one that needs more consideration and attention. Ideally the City or Wascana could consider a lawn display common in most botanical gardens (see photo below) providing homeowners with good alternatives where they can see groundcovers and grasses side by side in both sun and shade. Supporting this display would be educational panels explaining the carbon footprint of those choices, the cost of maintaining each, the landfill implications and the benefits to our pollinators, birds and to humans. We have been very happy with our blue grama lawn. It is not the greenest of our three lawns and it is somewhat fine and thin. It would never win a green lawn competition, unless irrigation wasn't allowed! It has value and benefits to nature and this makes us happy. That it is easy to take care of is a bonus.

Seed heads in winter

Decorative seed heads in late summer

Lawn display at the Missouri Botanical Garden



Providing a habitat for pollinators requires food, cover and plants to raise caterpillars. Photos left to right: Bee on purple prairie clover, monarch on Echinacea angustifolia; and at the University of Wisconisn: Oshkosh where unmown native plant lawns and habitat areas are commonplace.

Notes:

1. Could not find a source to date geological age of blue grama but the prairies formed when the ice sheets retreated. Books such as “The Land where the Sky Begins” and “Islands of Grass” mention the ice sheets retreated 9900 to 13500 years ago.
2. https://www.fs.fed.us/database/feis/plants/graminoid/bougra/all.html
3. https://blog-yard-garden-news.extension.umn.edu/2019/08/food-for-butterflies-eyelash-grass.html
4. ‘Ecosystem services’ is the official lingo to describe the value of nature. For example nature cleans the air, provides for pollination, cleans water through wetlands, provides for food and medicines, and provides for our health and well being and so on. Our North American society understands value based on a monetary basis e.g. bees provide X number of dollars to the farmer to pollinate crops, or water is cleansed for free by wetlands. There is a component of ecological services that tries to monetize these services in an effort to make good long term decisions. An full explanation of the term can be found here: https://en.wikipedia.org/wiki/Ecosystem_service
5. https://www.denverwater.org/sites/default/files/sustainable-landscape-conversion3.pdf
6. https://www.umces.edu/sites/default/files/Blue-grama-summary.pdf
7. Nora Stewart, author of “Cultivating Our Roots- growing authentic prairie wildflowers” available from the Native Plant society of Saskatchewan. The website includes a host of prairie books for purchase as well as free resources. https://www.npss.sk.ca/store/publications
8. Thanks to the many people who planted their native plant gardens long before me and shared wisdom and information. These included Charlie Thomson, Dieter Martin, Cynthia Cohlmeyer, Ruby Buick, Robin Smith, Keith Barr, Chet Neufeld, Lawrence Baschak, the biologists and fellow staff at Scatliff Miller and Murray and likely a few more people who I have momentarily forgotten.

Ingrid Thiessen is a Regina landscape architect with an interest in native plants.