

Native Grasses for Warm Season Pastures

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History.

Native prairie grasses have been grazed for eons in the Midwest and Great Plains by wild ruminants, as well as in historic times by domestic livestock. Although few Wisconsin livestock producers use native forages in their grazing systems, these forages do offer some valuable opportunities, especially if our climate becomes more variable, and hot, dry periods reduce the dependability of cool-season pasture production.

North American grasslands existed in a gradient from short grass prairies in the dry western states to tall grass prairies in our more humid region. In Wisconsin, a transition zone between prairies and forests cuts across the state from northwest to southeast. Because of our position on this tension line between prairie and forest, grazing and fire were important in maintaining the open character of Wisconsin grasslands and oak savannas. Today, less than one percent of the original prairies still exist. While the CRP program and public prairie restoration efforts have helped preserve this unique habitat, the incorporation of native plants into working pasture land can also contribute to natural resources goals while providing useful forages for producers.

Warm-Season versus Cool-Season.

The dominant grasses of the prairies--big bluestem, little bluestem, switchgrass, and indianguass--are warm season species. Unlike the common cool-season species, warm-season grasses begin growth as the soil warms up in mid-summer and put in most of their growth in July and August. They are at their peak of quality beginning in late June and during the next two months produce tonnages similar to cool-season seasonal production. Potentially, they can fill in the gap during the cool-season summer slump.

Although they are expensive and a challenge to establish, warm season grasses are extremely heat and drought tolerant and produce well under low fertility conditions. In addition, they are soil builders with root systems of 6 to 8 feet in depth and they provide high quality habitat for grassland birds and other wildlife.

Warm-season grasses are efficient users of nitrogen. They are as productive as cool-seasons on less than half the applied nitrogen. As a result, they tend to have lower nitrogen levels in tissues and lower crude protein levels than cool-season grasses (usually between 6 and 12%). However, recent research suggests that much of this protein is 'by-pass protein' which is more efficiently utilized by ruminants than other forms.

Warm season grasses store carbohydrates differently, too. This results in higher fiber levels and lower RFV values for warm season pastures, but again, there is some evidence that these compounds are digested differently than the fiber in cool season grasses and that our current quality analyses do not adequately reflect the digestibility of warm season grasses.

Still, forage quality is an issue. Although it would be tough to maintain good milk production on warm season pastures, they are very appropriate for most other livestock classes. Remember, too, that you're only grazing these pastures for a couple of months during the hottest part of summer (when cool season pasture quality tends to be low as well). Supplementation or a combination of warm season and cool season pastures can help

balance rations. Interseeding legumes can improve quality as well. The bunch grass structure of most warm season grasses leaves gaps of open ground that can potentially be filled in with legumes, annual ryegrass, or even brassicas (research data supports the effectiveness of legumes with warm seasons; I don't think other possibilities have been examined).

Establishment.

There's something inspiring about a field of prairie grasses, harkening back to pioneer days, but that's probably not enough to warrant taking on their challenges for most people. Each producer must weigh the pros and cons of warm seasons before embarking on this adventure.

On the down side, warm seasons are painfully slow to establish, somewhat challenging to manage, relatively low in quality, and the seed is expensive. In their favor, warm season grasses are heat- and drought-tolerant, low input, high tonnage forages with the added benefits of building soil organic matter and providing high quality wildlife habitat.

If you're up for the challenge, you'll want to start small. You're looking at July and August use, so in the long run, warm season pastures should comprise no more than 1/3 of your pasture acreage. You might want to start with just a few acres.

Species selection.

There are distinct differences among the common warm season grasses and, while a mixture may be the most sustainable over the long term, it pays to use individual characteristics to guide species selection.

Of all the warm season grasses, switchgrass (*Panicum virgatum*) is most similar to the cool-season species we're familiar with. Switchgrass is the only sod-former of this group and it tends to mature the earliest, being ready to graze in mid- to late-June. It is also smooth-seeded, making it easier to plant with conventional equipment (indiangrass and big and little bluestem have 'fuzzy' seeds which require a specially equipped drill, often available from your local DNR office).

Big bluestem (*Andropogon gerardii*) is a bunchgrass that matures somewhat later, in early- to mid-July. Although no substantial research has been done on these species in our region, the existing literature suggests that big bluestem provides the best combination of tonnage and quality. Although it tolerates droughty soils well, it also thrives on medium to somewhat wet soils. Local researchers have documented individual big bluestem plants that have survived for 35 years or more.

Little bluestem (*Schizachyrium scoparium*) is smaller in stature and produces less tonnage, but is highly drought tolerant, more so than any other of the species.

Indiangrass (*Sorghastrum nutans*) is the latest maturing of the primary warm season species and produces tonnages similar to big bluestem.

Other species that are commonly used in warm season mixtures include sideoats grama (*Bouteloua curtipendula*), a sod-forming grass which is highly tolerant of grazing; eastern gamagrass (*Tripsacum dactyloides*); and Canada wildrye (*Elymus canadensis*), a short-lived, native cool-season grass, which makes a good nurse crop for the slower growing warm season grasses.

Seeding.

Whether seeding a mix or a pure stand of one species, a total of 8 to 10 pounds of seed per acre is

recommended. The only exception is switchgrass, which should be seeded at 5 pounds per acre. A nurse crop of oats, annual ryegrass, or Canada wildrye can be added where erosion is a concern.

As with any other perennial crop, fertility issues should be dealt with prior to establishment. Correct pH, P, and K deficiencies, but do not apply nitrogen in the establishment year. The prairie grasses will not need it and it will only encourage weed growth.

Under most circumstances, establishment of a stand of native warm season grasses takes a good two years. Because of their slow growth, pre-plant and early establishment weed control is critical. Quackgrass and other perennial weeds are the biggest threat to a developing warm season stand. These species must be eliminated before you begin.

I've seen two seeding methods work well. The first is seeding the warm season species following a year or two of corn. If good weed control is maintained for the corn (an annual warm season grass), weed pressure will be decreased for the following establishment year. In fact, some people have had good luck sowing the warm season grasses the same year as the corn. The prairie grasses are drilled in first, then the corn is planted over the top at a relatively low population. The corn is taken off early for silage, allowing the prairie grasses to get their start under the canopy.

The second approach is to start with an existing cool season sod, killed with a non-selective herbicide. The warm season grasses are no-till drilled into the dead sod and the sod acts as a mulch, suppressing weeds and maintaining uniform moisture for the developing seedlings.

Maintenance.

Be prepared to wait. With cool season pastures or annual crops, most people start looking for germination in 1 to 3 weeks. Don't even bother to look for your warm season grasses until August—you won't see anything before then. When you do find them, they won't look like much. They've spent much of their early growth in root development. For every inch of above ground tissue you'll see, there's two inches or more of root structure below the surface.

Once you've got the seed in the ground, first year maintenance involves an occasional mowing when weeds get a foot tall or so. The field will look messy and your neighbors will complain, but be patient. A thin stand of annual weeds, as long as they don't go to seed, makes a decent cover crop. You may also want to consider using a new herbicide, Plateau, which was developed specifically for native grass establishment.

Grazing, finally.

If establishment is good, you may be able to graze the field lightly the second year. It will be ready to graze sometime between late June and early July and you'll probably be able to graze each paddock once or twice. Just as with cool-season pastures, rest periods are important. Warm seasons should be grazed at 10 to 12 inches in height and about half the forage should be removed with each grazing event. Once the field is well established, a late April or early May grazing will help control weedy cool season grasses and help maintain a strong stand.

Over the long term, a number of management practices will help maintain a healthy stand. Burning may be an option if fences can be adequately protected. These grasses evolved with fire and a spring burning every 3 years liberates nutrients, controls weeds and warms the soil.

Nitrogen fertilization will aid growth and improve quality. Do NOT apply in early spring. Apply 50 to 60 pounds of N in late May or early June, when the warm seasons begin to grow. Alternatively, either

conventional or native legumes can be frost seeded into the stand as a source of nitrogen and to improve quality. Birdsfoot trefoil works particularly well for this. Native legumes are expensive and can be difficult to establish. Three that may be suited to pasture use (again, little research has been done) include purple prairie clover, round-headed bush clover, and Canada tick trefoil. Other native plants can add diversity and some are quite inexpensive. Such plants as black-eyed susan, yellow coneflower, or beebalm, while not contributing significantly to forage yield or quality, will add visual interest, improve wildlife habitat quality.

If you're interested in seeding down a native warm season pasture, there are a number of information sources available to help you get started. Your local DNR office is a good place to start. Local NRCS offices can help and, in some cases, may have cost-sharing available. The Prairie Enthusiasts, a grassroots organization with chapters throughout the state is another good source of information. Contact Gary Eldred at 4192 Sleepy Hollow Road, Boscobel, WI 53805, 608/375-5271.