Grass Clippings

pasture research you can use

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In this issue

Grazing and Sherlock Holmes

One of the dictionary definitions of a mystery is as "something not understood or beyond understanding." The second meadow fescue article in our series from Mike Casler reminds me that it is a fine example of just one of the many mysteries that pasture systems provide us with.

On a daily basis, most of us are busy trying to unravel the complexity of pastures and increase our understanding of managed grazing. The farmer who is fine tuning fertility management, the researcher using DNA analysis, and the economist evaluating a grazing dairy's financial performance are all working on individual mysteries that make up pasture-based farming systems.

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Orchardgrass, tall fescue, and meadow fescue response to nitrogen rate

Geoff Brink and Michael Casler, USDA-ARS, U.S. Dairy Forage Research Center

Nitrogen has a greater effect on pasture grass growth than any other input except moisture. The cost of fertilizing pastures with N, however, has risen significantly. In the past year, the price of urea (46-0-0) has increased from about $280 to $450 or more per ton. Seeding pastures with legumes such as white clover, red clover, kura clover, or alfalfa is an excellent option (www.uwex.edu/ces/crops/uwforage/GN-Interseeding.pdf), since legumes not only contribute N through nitrogen fixation but also improve forage quality and intake. However, if a grazier is unable to grow legumes or feels that N fertilizer produces more dependable pasture growth, then understanding the relationship between yield and N rate would help him or her decide on an appropriate N fertilization rate.

Methods

'Barolex' soft-leaf tall fescue, 'Bronc' orchardgrass, and 'Bartura', 'Hidden Valley', and 'Azov' meadow fescue were broadcast-seeded at recommended rates in April, 2004 at the UW Lancaster Agricultural Research Station and at the Marshfield Agricultural Research Station. 'Hidden Valley' and 'Azov' meadow fescue are new varieties currently undergoing seed multiplication that are not yet commercially available to producers. In 2005 and 2006, plots were harvested from May to October whenever canopy height reached 10 – 12 inches (total of six harvests) at a 4-inch stubble height. Nitrogen fertilizer as ammonium nitrate was applied at 0, 20, 40, 60, or 80 lb/acre in late April before the first harvest and immediately after the second and fourth harvests for a total of 0, 60, 120, 180, and 240 lb N/acre/year. All rates were split evenly in order to permit valid comparison of application rate without the effect of application date. **Nitrogen use efficiency (NUE)** was calculated using the following equation:

NUE (lb DM produced/lb N fertilizer applied) =

(DM yield at $N_{60,120,180,240\ \mathrm{lb/acre}}$ – DM yield at $N_{0\ \mathrm{lb/acre}}$)/N applied

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To get from mystery to understanding, we have to be observant, study the clues, and keep an open mind. Discussing the question over a cup of coffee, during a pasture walk, or at a conference often provides us with other clues that help.

Sometimes the understanding comes quietly, as our minds turn over the possible directions a decision will take us until we come to an answer. Sometimes understanding hits us over the head! And yes, sometimes those answers elude us and will remain an intriguing mystery for someone else to solve. The dynamic nature of pasture systems guarantees that there will be many more mysteries to work on...

Rhonda

Grass Clippings features grazing-related research news from the University of Wisconsin and beyond.

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Response to nitrogen rate ... *from page 1*

Results

Similar to previous studies of cool-season grasses and N rate, we found that annual yield of all varieties increased as N application rate increased from 0 to 240 lb N/acre (Figure 1). The mean annual yield over all N rates was greater at Lancaster (4150 lb) than at Marshfield (3200 lb), and the linear trend representing the rate of increase in yield relative to N rate was also greater at Lancaster (16.4 vs. 13.8 lb DM produced/lb N applied). In other experiments conducted in both southern and north-central Wisconsin, we have found that due to more favorable summer temperatures and precipitation in Marshfield, annual grass yield is roughly equal in both regions of the state despite the longer growing season in the south. One possible explanation for the results of this study is that, with the exception of September 2005 and May 2006, precipitation during the growing season at Marshfield (April to September) was significantly below normal.

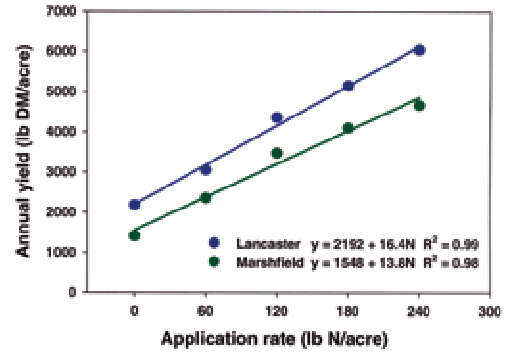

Fig. 1. Annual DM yield as influenced by N fertilization rate at Lancaster and Marshfield, WI (mean of 2 years and 5 grass varieties).

Although increasing the N application rate continually increased annual yield at both locations, a measurement of nitrogen use efficiency provides a very different assessment of the value of applying more N. From an agronomic perspective, nitrogen use efficiency (the yield produced for each unit of N applied) increased from about 15 lb DM/lb N applied at 60 lb N/acre/year to about 18 lb DM/lb N applied at 120 lb N/acre/year (Figure 2). However, as N rate increased above 120 lb N/acre/year, nitrogen use efficiency declined, indicating that although added N produced more yield, the ability of these grasses to efficiently utilize the N declined.

When considering N fertilization of pastures, two additional factors should be taken into account: timing of application and N recycling. Dennis Cosgrove at UW-River Falls conducted a study to see how N application date affected pasture yield (http://www.uwex.edu/ces/crops/uwforage/GN-Nitrogen.pdf) and found that a single 50 lb N/acre application to orchardgrass in May resulted in the greatest nitrogen use efficiency and economic return per

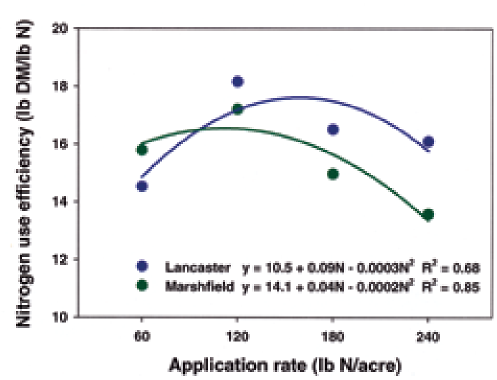

Fig. 2. Nitrogen use efficiency as influenced by N fertilization rate at Lancaster and Marshfield, WI (mean of 2 years and 5 grass varieties).

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Meadow fescue in the Driftless Region, part two

Michael Casler, USDA-ARS, U.S. Dairy Forage Research Center

Following our work to identify meadow fescue on the Charles Opitz farm described in part one (*Grass Clippings*, April 2008), it quickly became evident that meadow fescue was present on other farms within the region. This article describes our survey efforts to define the portion of the Driftless Region in which this naturalized meadow fescue can be found.

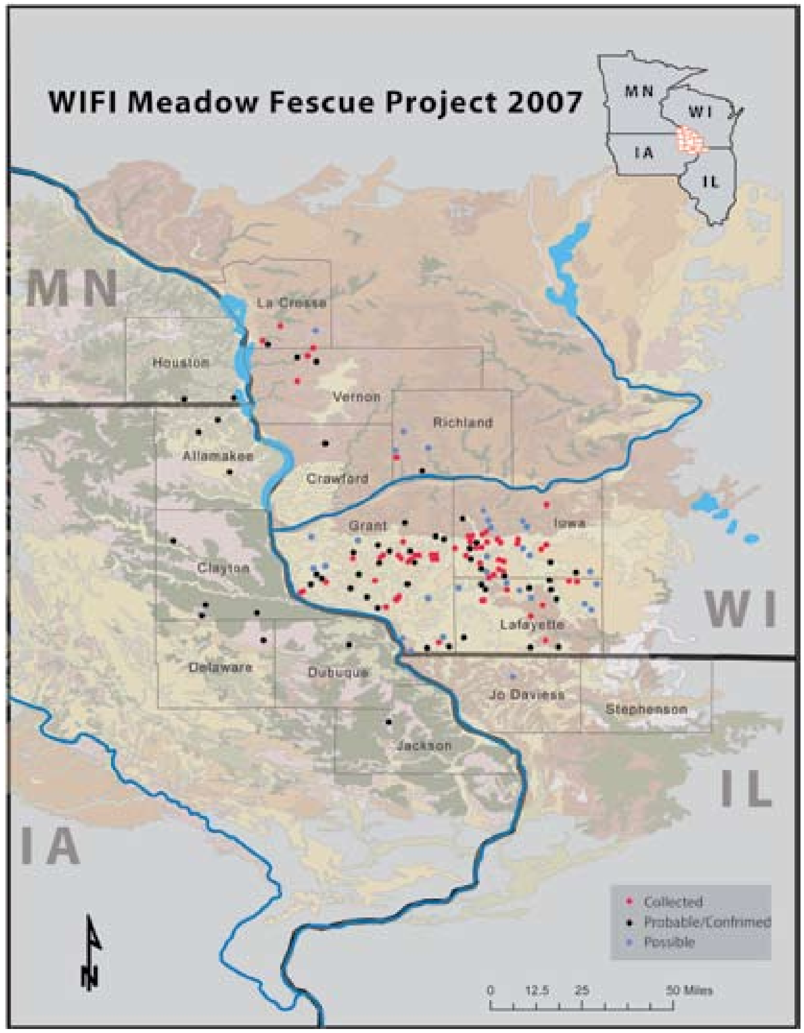

Figure 1. Geographic distribution of project

The Driftless Region

During the summer of 2007, my summer crew and I traveled over 17,000 miles in Wisconsin, Illinois, Iowa, and Minnesota, covering as much of the Driftless Region as possible. The crew was mostly made up of undergraduate students at the University of Wisconsin, studying a range of topics, most of which had little to do with agriculture. Nick Baker, a technician at the Dairy Forage Research Center, provided a lot of leadership for the students. The project was a real eye-opener for them, providing a great opportunity to sharpen their powers of observation, to learn something about livestock agriculture, and to meet some graziers. They quickly became a very eager and enthusiastic group.

Over the years, I've become quite good at grass identification, learning to identify many of the common grasses even at 65 miles/hour. This project was a challenge for me, as well as the students, because we were trying to tell the difference between two types of fescue. Believe me, even 25 miles/hour may be too fast to tell the difference between tall fescue and meadow fescue. There's a lot of tall fescue in ditches, roadways, conservation strips, and pastures in southwestern Wisconsin! We quickly learned that discriminating tall fescue from meadow fescue was a lot easier on sunny days when the meadow fescue leaves glistened in bright sunshine, almost as though they were covered in dew.

Rhonda Gildersleeve, UW Extension Agricultural Agent for Iowa County, Wisconsin, was helping us to identify graziers who thought they might have the "mystery" grass on their farm. Thanks to her valuable assistance, we quickly found several new farms that were loaded with meadow fescue. This provided my students and I with valuable training in learning how to identify likely looking spots and vastly improved our confidence levels. We quickly found dozens of farms with meadow fescue in the Mineral Point area.

As we began to move away from this area to expand our survey region, certain boundaries became obvious (Fig. 1). Every positive sighting of meadow fescue was within the Driftless Region of southwestern Wisconsin, northwestern Illinois, northeastern Iowa, and southeastern Minnesota. The vast majority of meadow fescue identifications are within Iowa, Lafayette, and Grant Counties of Wisconsin, with a secondary concentration in Crawford, Vernon, La Crosse, and Richland Counties. We've also identified meadow fescue on a number of farms in Illinois,

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Meadow fescue... *from page 3*

Iowa, and Minnesota, also within the Driftless Region. All told, we've identified meadow fescue on over 300 farms within the region, with frequent additional reports as graziers learn to identify their own meadow fescue after participating in pasture walks on farms with confirmed populations of meadow fescue.

This region was not glaciated during the Pleiostocene Glaciation. It is characterized by hill country with highly eroded and shallow soils, frequently exposed limestone bedrock, cold and clear streams, and many examples of the ancient oak savanna ecosystem. These remnant oak savannas represent only tiny slivers of a once vast ecosystem that served as a transition between the even-more-vast tallgrass prairie and the eastern hardwood forests. The oak trees, mostly bur oak in this region, are about the only thing left in these oak savanna remnants. We think this is where most meadow fescue survived the industrialization and mechanization of agriculture in the Driftless Region, combined with significant urban development, during the 20th century.

Possible origins

Although we have not conducted formal interviews with all landowners, every conversation has had the same result—there are no records of landowners having planted improved varieties of meadow fescue on their farms. In some cases, pastures that contain meadow fescue have been in grassland for as long as memories and land records can document. In other cases, former cropland was allowed to revert to grassland naturally, with the landowner accepting that which Mother Nature provided. I think we can fairly certainly eliminate the possibility that the Driftless meadow fescue is derived from some form of improved or bred variety.

Okay, so what is it? Most likely it's a version of one or more ancient European land races that has become naturalized to soils and climate that characterize the Driftless Region. In short, it's become a land race of the Driftless Region. It's likely been here for anywhere from 80 to 170 years, changing ever so slightly from one generation to the next as climate, management practices, and rural landscapes have changed. Like most perennial grasses, populations of meadow fescue plants are genetically diverse. We cannot see most of this diversity, because there are very few genes that actually result in significant (observable) morphological changes to grass plants. Just like with humans, the vast majority of genes code for the complex internal workings that allow the organism to function, survive, and reproduce. But, because meadow fescue plants can only arise from cross-pollination between two parental plants, new genetic combinations are always being created.

A colleague of mine recently published a paper demonstrating that meadow fescue survived the Pleiostocene Glaciation in three relatively small areas: Spain and Portugal, the Balkan Peninsula, and the Caucausus Mountains. After the glaciers receded about 12,000 years ago and the climate warmed, meadow fescue gradually spread throughout Europe and western Asia. This migration can be tracked using DNA from plant chloroplasts, much the same way that ancient human migrations have been tracked using DNA from mitochondria. Chloroplast DNA is inherited directly from mother to daughter, so it is very resilient and can be used to track genetic lines.

We've discovered that both the Spanish line and the Balkan line are present in the Driftless Region, sometimes both within one farm. This implies that there have been multiple introductions of meadow fescue to this region, perhaps by multiple migration events or mechanisms.

We've developed three theories about the origin of meadow fescue in this region. We may never be able to separate among these three ideas and, indeed, all three may have contributed to the meadow fescue that we find in this region today.

The primary immigration theory involves the direct migration of Europeans to the Driftless Region, bringing seed of their local land races, including both grains and forages, on their migrations. The secondary immigration theory involves the migration of second- or later-generation immigrants from the eastern United States to

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Meadow fescue... *from page 4*
the Driftless Region, also bringing later-generation seed stocks along after some years of trial-and-error in the eastern United States. The third theory, the summer-winter pasture theory, involves a bit more history.

How did tall fescue replace meadow fescue?
Meadow fescue first arrived in the United States in the late 18th century—at least that's the first documented arrival of this grass from across the Atlantic Ocean. There was a lively seed trade in the 19th century, with merchants selling seed of various land races and some touted as better than others based on anecdotal evidence. The meadow fescue seed trade was active on both sides of the Atlantic, with seed moving in both directions, depending on farmers' needs and, no doubt, skills of the merchants. Meadow fescue was popular in the British Isles, but seed production was poor due to the wet climate, so British merchants ironically imported meadow fescue seed from the United States and Canada.

Shortly after the turn of the century, the Bureau of Plant Industry (the predecessor of the USDA), began sending plant explorers such as Frank Meyer on multiyear collecting expeditions all around the world. These explorers were charged with bringing back seeds or cuttings of any plants that might be perceived to have value in the United States. Tall fescue was one of these plants.

Initial screenings of tall fescue collections from southern Europe and the Mediterranean region led early agronomists to make seed increases for formal tests and trials. Because meadow fescue was quite common throughout much of the eastern United States at this time, it was the logical "control" plant to which the new tall fescue collections were compared. Reading some of this early literature gives one a sense of the level of excitement these trials generated among the early agronomists when they observed consistent 10-15% yield advantages for tall fescue. However, agronomists being a fairly conservative lot, it was quite a few years before tall fescue took the market by storm.

From 1929 to 1956, when the USDA kept statistics on meadow fescue seed production in the United States, the annual meadow fescue seed crop ranged from 15,000 to 330,000 lbs with an average of 100,000 lbs/year (Fig. 2). Tall fescue first showed up at 2,000 lbs in 1938 and showed some slow gains for the next four years. Everything changed when the first tall fescue variety, KY-31, was released in 1943. Tall fescue seed production exceeded 2 million lbs in 1950 and 5 million lbs in 1952! By the late 1950s, meadow fescue had disappeared from the public consciousness, the USDA statistical reporting service, and from much of the agricultural landscape. Although I've worked on forage grasses for 32 years, I never learned anything about meadow fescue as a forage crop until after I joined the grazing movement in 1989 and began studying grasses that would perform well under management-intensive rotational grazing. Even then, the only information and seed of meadow fescue came directly from Europe.

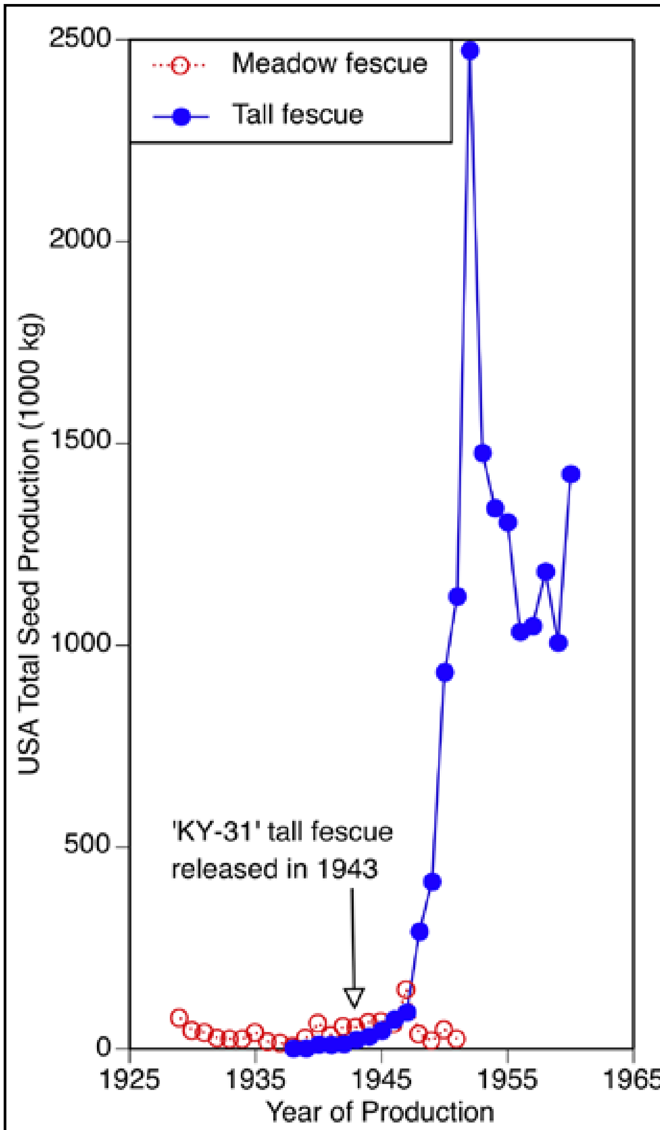

Figure 2. Total seed production in U.S. by year

A sleeping giant awakens
This brings us back to the summer-winter pasture theory. In the late 19th century and early 20th century, when meadow fescue was fairly common in the United States,

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Meadow fescue... *from page 5*

it was common for cattle to be grazed on meadow fescue pasture in the mid-south (Missouri and Arkansas across to the Carolinas) until spring. Cattle were then loaded onto trains and shipped north to the Driftless Region for summer grazing and finishing. It's easy to imagine that cattle had grazed meadow fescue pastures with ripened seed, bringing those seeds to the Driftless Region in their guts. By this time, the oak savanna ecosystem had become heavily degraded with most native species in the oak understory lost to overgrazing. Meadow fescue could have easily become established in these degraded ecosystems.

Our survey has identified a high frequency of meadow fescue pastures near the historic Military Ridge Road of southwestern Wisconsin. While we cannot find any records of the grasses that were imported to this region during European settlement, it seems likely that movement of cattle and grass in the 19th century would occur in close association with the Military Ridge Road from Portage to Prairie du Chien.

Within the Driftless Region, meadow fescue occurs in a wide range of habitats. It ranges from bottomlands to dry hilltops, deep to shallow soils, heavily grazed to infrequently grazed areas, and from open sun to deep shade. Nearly all fields of meadow fescue are intimately or marginally associated with remnant oak savanna, suggesting that these oak trees acted as a refuge for meadow fescue on those farms that were row-cropped before natural conversion back to pasture. It seems to prefer silt loam soils over sandy soils, as evidenced by our inability to find any meadow fescue in the Wisconsin River Valley (Fig. 1).

Since beginning to work on this project, two questions have consistently nagged at me. Why here and why now? The "now" is fairly easy to explain and likely relates to the grazing movement of the past 20 years. Natural conversion of cropland to pasture and increasing awareness of managed grazing systems with highly controlled stocking rates and grazing frequencies favors meadow fescue. Our observations from the Opitz farm and others suggest that it has excellent drought tolerance and winterhardiness.

The other part of the "now" question relates to increased knowledge and understanding among graziers of grass growth and its response to grazing. With increasing experience, graziers are modifying their stocking rates and grazing frequencies to enhance productivity of pastures and livestock. Charles Opitz firmly believes that modifying his behavior and grazing management is partly responsible for his meadow fescue populations increasing from a few small acres to hundreds of acres of healthy, productive, and resilient pasture. It's reasonable to think that changes in grazing management may have favored meadow fescue on quite a number of farms.

The "why here" question is much more difficult to answer and I can only speculate on this one. We know that meadow fescue comes from northern Europe and from high altitudes of mountains in southern Europe. It's a cold-weather type of grass that has some drought tolerance, but not a lot of heat tolerance—nothing like tall fescue. The Driftless Region likely contains a lot of environmental similarity to native European habitats for meadow fescue—similar soils and climate.

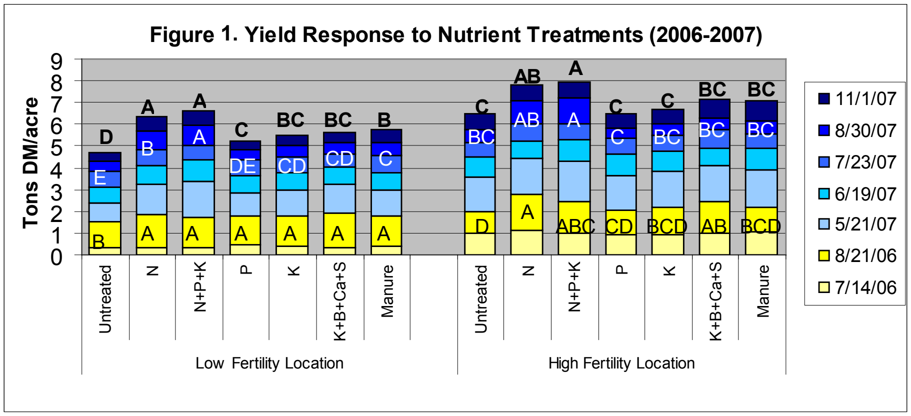
The hill country, the remnant oak savannas, and the long-term grazing culture of the Driftless Region are likely other reasons that contribute to the "why here" question. Once it arrived it was obviously very well adapted and a combination of adaptation to the local environment, places to survive disturbances and changes to the landscape, and possibly some genetic changes to become better adapted to the region may all be factors contributing to its longevity and persistence in this region.

One thing very interesting about Europe compared to the Driftless Region: my European colleagues are very concerned about the effects of global warming on meadow fescue. It seems that this grass is suffering particularly more than other grasses. Meadow fescue at lower altitudes in the Alps and other mountain ranges is rapidly declining, giving way to other grasses. In Europe, meadow fescue has the reputation of being a non-competitive species. Clearly, we are observing a different response here and it may relate to adaptation and natural selection. We've found many farms with healthy populations of meadow fescue growing in a dense monoculture.

Our work on the Driftless meadow fescue will continue for many more years as we work to characterize the plants we have collected on many farms. We hope to learn more about the origins and diversity within the Driftless meadow fescue and to use this knowledge to assist graziers in managing their populations or to help other graziers to establish meadow fescue on their farms.

Influence of fertility on pasture species diversity, yield and quality, part two

Nick Schneider, Winnebago County UW Extension Agriculture Agent



In part 1 (*Grass Clippings*, April 2008), we reported on the effects of pasture soil fertility on species diversity from the GLCI funded research ***Influence of Fertility on Pasture Species Diversity, Yield, and Quality, Project #533-2,*** conducted at two locations of differing soil fertility on the Marshfield Agriculture Research Station in 2006 and 2007. Part 2 of this series will discuss plot differences in yield and forage quality. The final article of this series in the next issue of *Grass Clippings* will feature economic considerations and some overall conclusions.

Yield results

Background soil fertility and nutrient treatments both influenced pasture yields. The combined 2006-2007 yields ranged from 4.75 tons dry matter per acre in the untreated check of the low fertility location to a high of nearly 8 tons per acre in the N-P-K treatment of the high fertility location. This represents a yield increase of approximately 68% above the untreated plots. Figure 1 presents the yield response to nutrient treatments. Significant yield differences are denoted by letters embedded in each treatment bar. Both locations shared some similar responses to nutrient applications, with the two nitrogen-based treatments resulting in the greatest total yields. The treatments with potassium, potassium + micronutrients, and manure had similar yields at both locations.

In the low fertility location, the untreated check had the lowest yield throughout most of the harvests. Due to the low background fertility, nutrients applications have a high likelihood of yield response. The phosphorus treatment contributed to a slightly greater yield than the untreated in the seeding year and total yield. Treatments containing potassium or manure resulted in a yield increase of 0.75 to 1 ton dry matter combined over two years.

At the high fertility location, treatments consistently yielded 1.25 to 1.75 tons dry matter more than the same treatment in the low fertility location. It should be noted that the high fertility location was established three weeks prior to the low fertility location which contributed to an additional 0.75 ton of dry matter in the July 14, 2006 harvest. Only the nitrogen-based treatments clearly had a greater total yield than the untreated check in the high fertility location. A small yield increase was measured in the establishment year with some nutrient treatments.

Forage quality

Forage quality and mineral composition data are presented in Table 2. Analysis includes the six harvest dates from August 21, 2006 to November 1, 2007 in the low fertility location and only the November 1, 2007 harvest at the high fertility location. When comparing the November 2007 harvest quality results, crude protein, NDF and RFV were similar between the high and low fertility locations.

Similar to yield results, the two nitrogen-based treatments typically were different from the other treatments for forage quality. The dominance of grass in the nitrogen treatments likely contributed to a lower crude protein, TDN and RFV with greater NDF, indicating nitrogen nutrient applications contributed to inferior forage quality. However, it should be noted NDF digestibility was not measured in this study. Despite the quality difference, all treatments across all harvest dates had forage quality that is acceptable for feeding to lactating dairy cattle (Hoffman and Shaver, 2006).

Content of potassium and phosphorus in the forage samples were reflective of nutrient applications. Treatments containing potassium fertilizer had the greatest content

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Table 1. Forage Quality Measurements

Low Fertility Location, Harvests 8/21/06 to 11/1/07

	C. Protein	NDF	RFV	TDN	Ca %	K %	Mg %	P %
Untreated	19.6 ab	37.0 b	175.7 a	69.5 a	1.05 a	1.94 c	0.43 a	0.31 c
N	18.7 c	39.5 a	162.8 b	68.7 bc	0.77 c	1.81 c	0.39 b	0.33 bc
N+P+K	18.5 c	39.4 a	163.0 b	68.3 c	0.75 c	2.64 a	0.33 c	0.31 bc
P	19.5 ab	37.4 b	174.3 a	69.3 ab	1.01 ab	2.00 c	0.43 a	0.36 a
K	19.4 ab	37.7 b	171.8 a	68.9 b	1.02 a	2.47 ab	0.39 b	0.32 bc
K+B+Ca+S	19.8 a	37.4 b	173.6 a	69.1 ab	1.01 ab	2.55 a	0.37 b	0.32 bc
Manure	19.2 b	37.8 b	171.7 a	69.1 ab	0.95 b	2.25 b	0.38 b	0.34 b
Average	19.3	38.0	170.4	69.0	0.94	2.24	0.39	0.33
P-Value	0.0003	0.0001	0.0002	0.0048	<0.0001	<0.0001	<0.0001	0.0068
LSD (0.05)	0.5	0.9	5.4	0.5	0.07	0.23	0.03	0.024

High Fertility Location, 11/1/07 Harvest Only

	C. Protein	NDF	RFV	TDN	Ca %	K %	Mg %	P %
Untreated	19.6 a	33.3 b	208.0 a	74.2 a	0.69 a	3.03 bc	0.18	0.42
N	16.6 b	37.4 a	180.7 cd	72.6 bc	0.54 bc	2.90 c	0.17	0.40
N+P+K	17.2 b	38.5 a	174.8 d	72.3 c	0.46 c	3.33 a	0.15	0.35
P	18.8 a	34.6 b	198.8 ab	73.7 a	0.74 a	2.96 c	0.18	0.39
K	18.9 a	35.2 b	194.2 bc	73.5 ab	0.70 a	3.33 a	0.17	0.39
K+B+Ca+S	19.0 a	35.2 b	194.4 b	73.5 ab	0.68 a	3.23 ab	0.16	0.39
Manure	19.4 a	34.4 b	199.6 ab	73.6 a	0.61 ab	3.11 abc	0.16	0.40
Average	18.5	35.5	193	73.4	0.63	3.10	0.17	0.39
P-Value	<0.0001	0.0005	0.001	0.0055	0.0042	0.0082	0.0998	0.5469
LSD (0.05)	1	2	13.6	0.9	0.14	0.25	NS	NS

Means comparisons were performed with Least Significant Differences (LSD) at a 95% confidence interval. Treatments with similar yield or quality are denoted by the same letter (a,b,c, etc.) imbedded in the table or figure.

Pasture fertility... *from page 7*

of potassium in the forages. Similarly, the phosphorus treatment contributed to higher phosphorus content in the forage. Forage from the manure treatment had a greater potassium and phosphorus content than the untreated check. Potassium content in the forages from the high fertility location were greater than what is desirable for feeding to dry cows which can contribute to hypocalcemia (Kelling et al, 2002).

References

Hoffman, P., and R. Shaver. 2006. "A Quick Guide to Understanding Forage Test Results." University of Wisconsin-System Board of Regents. *Focus on Forage*-Vol 6:No.2.

Kelling, K., J. Peters, M. Rankin., and D. Undersander. 2002. "Potassium in Forages." University of Wisconsin-System Board of Regents. *Focus on Forage*-Vol 4: No. 4.

May 14 '07: Wide Location View: Low Fertility Location (L), High Fertility Location (R)

From the files of yesteryear: Making reed canarygrass seed more available in Wisconsin

Editor's Note: Ruth McNair located this interesting discussion from an early UW report by the WI Experiment Association, a forerunner of the present day Crop Improvement Association. The article details the rise of interest in reed canarygrass and early seed production efforts in Wisconsin. We thought you'd enjoy this trip back in time…

Excerpted from "Pure Bred Seeds Made Available By Experiment Association Growers" in *Report of the Wisconsin Experiment Association, 1929-1934,* E. D. Holden, Assistant Secretary.

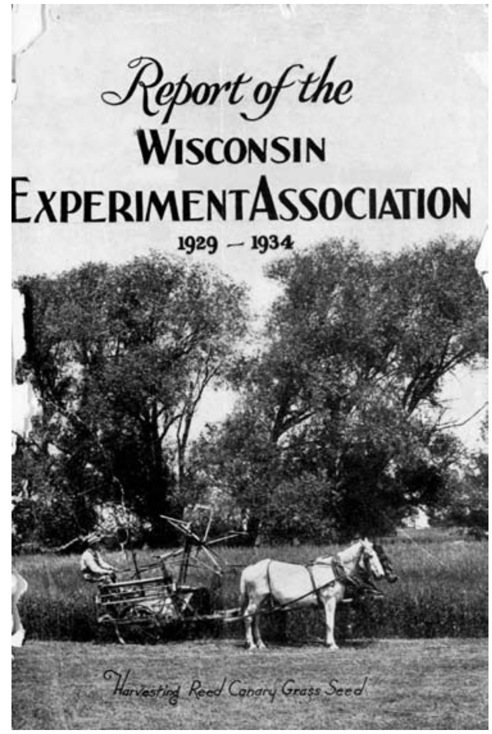
The primary purpose for which the Wisconsin Experiment Association was founded and the outstanding service which it is rendering is to make available to the farmers of the state seeds of the improved crop varieties produced by the Experiment Station. Experiment Association seed growers obtain pure bred foundation seed direct from the Station, and from this they grow their seed crop, giving attention to all those factors which have to do with producing a high quality product.

The growers offer this seed for sale directly to farmers or in many instances they supply it wholesale to seed houses. The Association each winter publishes a Seed List giving the offerings of its members.

The demand for this service in pure bred seeds has increased steadily since the early years of the Association, and the number of growers who have found this work profitable has likewise increased. In recent years about 500 growers have been offering in the neighborhood of a quarter of a million bushes of seed corn, grains, soybeans, field peas, clover, timothy, alfalfa, and other seeds.

[Sections not included here discussed registered, certified and inspected levels of seed and the year long process of producing seed.]

New seed production developments
The opening up of new possibilities in seed production is an important feature of Experiment Association work. The past five years have brought forth two new developments which are becoming very profitable for our growers and are rendering an important service to the state. These are reed canary grass and alfalfa seed production.



Reed canary grass is a perennial low land pasture and hay grass of high feeding value. Its outstanding advantage is that it grows well and produces large yields on wet lands which usually grow only weeds or marsh grasses of low value.

This crop is rapidly coming into favor and the demand for seed is so great that the total supply available in the country is practically sold out each year at a campartively [sic] high price. The seed supply is quite limited as there are at present only three localities in the United States where seed is produced in quantity. These seed producing centers are located in Oregon, Minnesota, and Wisconsin.

Fortunately seed can be harvested from canary grass fields without interfering with hay production, or hay and pasture, the same season. This makes it possible for growers who go into the crop primarily for forage purposes to take up seed production as a profitable side line. In this way the rapid increase in acreage is making seed more plentiful.

The peculiar seeding habits of reed canary grass necessitate unusual harvesting methods. The seeds begin to ripen in late June. They start at the top of the head and ripen

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Reed canarygrass *... from page 9*

progressively downward. They fall off the heads easily after they are ripe, so must be harvested without delay, and must be handled so as to avoid excessive loss from shattering.

The seed crop is harvested by cutting off the heads. These are usually dried a few days on the barn floor or on canvas in the sun before being beaten out with a fork or flail; larger quantities are separated with a threshing machine.

The Heads are Taken to a Suitable Place for Curing.

On small fields the heads are cut off by hand and put into bags, which is a rather slow process, but practicable for small areas. For larger acreages machines are used. The most common type is a header made from an old binder by stripping it of all unnecessary parts, building a large hopper on the platform and mounting the sickle bar on the front of the hopper on the platform and mounting the sickle bar on the front of the hopper, just high enough to clip off the heads. The machine is drawn by horses like an ordinary binder, and as it moves through the grass it cuts off the heads which are carried into the hopper by the reel.

The first of these machines used in Wisconsin was made at Beaver Dam in 1933, and harvested several thousand pounds of seed that season. In 1934 machines were constructed on several more farms from plans supplied by the Wisconsin Experiment Association co-operating with the Agricultural Engineering Department of the University.

Reed canary grass promises to be an important crop in Wisconsin and seed production should continue to be profitable for many years.

Upcoming events

Profitable pastures field day
UW Lancaster Agricultural Research Station, 7396 State Hwy 35/81, 5 miles west of Lancaster
August 15, 2008 10 am - 3:30 pm
Annual station tour and updates on current pasture management issues, including:

- **Meadow Fescue: Awakening a sleeping giant**, Mike Casler
- **Pastured poultry, anyone?** Adam Hady
- **Nitrogen management options for grass pastures**, Carrie Laboski

Cost is $10 including lunch. Field day will be held rain or shine. Please pre-register via phone by Aug. 12 to Rhonda Gildersleeve, Iowa County UWEX Office, 222 North Iowa Street, Dodgeville, WI 53533; phone 608-935-0391, e-mail rhonda.gildersleeve@ces.uwex.edu.

Response to nitrogen rate *... from page 2*

acre. Nitrogen application at this time takes advantage of the rapid growth during the grass's reproductive phase and favorable moisture and temperature conditions in the spring to maximize yield response to N. Application at other times of the year increased yield, but less efficiently than in the spring. Finally, the grazier should consider that some N is returned to the pasture by the grazing animal in manure and in senescing leaves and roots. The degree to which this N is available for plant growth is influenced by several factors, including grazing management (stocking rate and grazing height), uniformity of urine and feces distribution, N status of the grass or presence of legumes, N losses due to leaching or volatilization, and the type and quantity of supplemental feeding. Because of the variability associated with N recycling, the authors will not attempt to place a value on the quantity of N contributed to pasture growth, but instead make the grazier aware that it should be accounted for when considering N fertilization of pastures.

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