Grass Clippings

pasture research you can use

February, 2007 Volume 2, Number 1

UW Extension • UW-Madison Center for Integrated Agricultural Systems and College of Agricultural and Life Sciences • UW Agricultural Research Stations

In this issue

Greetings,

This time of year finds many of us longing for the first sighting of robins, green grass and all those other signs of spring that we look forward to.

The good news is that spring is just around the corner! Within this issue of *Grass Clippings*, you'll find useful articles on soil quality, red clover varieties, fertilizing pastures and carbon credits.

A summary of issues and opportunities in the Wisconsin grazing community will provide additional food for thought. As our winter season begins to wind down, consider volunteering to host a pasture

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Fertilizer management of pastures

Ken Barnett, Extension Educator, University of Wisconsin Extension

Whether or not to apply fertilizers to pastures to increase production raises questions that graziers need to consider. Some of these questions are:

- What are the production needs for the animals grazed?
- When are the forages needed in the grazing season?
- What species are present?
- What are the expected methods of management?

The answers to these questions will help determine if you use fertilizer/manure and the amount used. Soil tests should also be used to accurately determine phosphorus, potassium and lime needs. Soil testing helps you apply fertilizers where they are needed, and avoid applications to areas where they are not needed. Also, soil testing helps to prevent excessive soil levels of phosphorus and potassium. Runoff from rain or snow can carry phosphorus into streams and lakes, fueling algae blooms. Excessive levels of potassium can contribute to grass tetany or milk fever in grazing cattle.

Sampling the soil once every three to four years, or once in a crop rotation, is sufficient. Fields that are more susceptible to changes in nutrient levels, such as those with sandy soils, should be sampled more frequently. Take soil samples at any convenient time. Studies examining the effect of sampling time on soil test results suggest that test values for pH, phosphorus (P), and potassium (K) are typically slightly higher in early spring samples than in fall samples. To receive your recommendations early enough to enable you to apply the lime and fertilizer needed, it may be best to sample in the fall. Another benefit of fall testing is that fertilizer prices are more likely to be discounted then. Regardless of when you sample, it is best to be consistent from one year to the next.

A grazing situation is different than a haying situation. Each ton of dry matter removed per acre from the field as alfalfa hay also removes about 12 to 15 pounds of P_2O_5 and 55 to 60 pounds of K_2O. To maintain optimum soil fertility, a producer would want to use fertilizers or manure to replace these nutrients.

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walk this coming season, and/or provide your grazing network coordinator with some questions or ideas you'd like to see explored within your local group. The chance to learn from fellow farmers and to share your own experiences with others is an opportunity that has a pretty darn good cost:benefit ratio!

Rhonda

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

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Fertilizer management *... from page 1*

In an intensively grazed pasture, on the other hand, over 80% of the nitrogen, phosphorus and potassium are recycled back to the pasture. The fertilizer recommendation for a legume-grass pasture with a yield of 4.1 to 5.0 tons of dry matter per acre is 60 pounds of P_2O_5 and 240 pounds of K_2O. Thus, due to nutrient recycling, each ton of dry matter removed per acre from a legume-grass pasture actually removes about 2 pounds of P_2O_5 and 10 pounds of K_2O. Therefore, based on estimated dry matter removal, fertilize accordingly to maintain optimum levels of phosphorus and potassium. Since the timing of phosphorus and potassium applications is not critical, they can be applied separately, together, or in combination with nitrogen fertilizer.

An intensively grazed pasture may also require sulfur and boron. To determine sulfur needs, do a soil test. A sulfur availability index (SAI) is calculated by estimating the sulfur released from organic matter, sulfur in precipitation based on location, subsoil sulfur, and sulfur in manure if applied. If the SAI is 40 units or more, response to added sulfur is unlikely. If the index is between 30 and 40, the sulfur need should be confirmed by plant analysis. If the index is less than 20, sulfur should be added.

A legume-grass pasture has a high requirement for boron. If a soil test has a low reading for available boron or if a deficiency appears, topdress two pounds of actual boron per acre every three years. For a legume-grass pasture on sandy soils, topdress 0.5 to 1.0 pounds of actual boron per acre annually. This annual application will minimize the leaching effect with boron.

Taking a cutting of hay on some of the pasture acres to help regulate growth is a normal practice for many graziers. Each ton of dry matter removed per acre from a legume-grass pasture will also remove about 12 pounds of P_2O_5 and 48 pounds of K_2O. To maintain optimum soil fertility, a producer would want to use fertilizers or manure to replace these nutrients.

Since legumes are desired in pastures, special care should be taken to ensure adequate phosphorus and potassium levels. Grasses are more competitive for phosphorus and potassium than legumes. Thus, lower levels of phosphorus and potassium would give grasses a competitive advantage and would decrease the legume portion of the pasture over time.

If your current pasture production is less than desired, applying nitrogen fertilizer can increase pasture yields dramatically. Measured pasture yield increases of 400% or more have been noted in past research. Nitrogen and moisture are the main factors which limit pasture growth. If you have noticed lush, dark green growth surrounding manure and urine spots in your pastures, this is an indication of nitrogen deficiency.

A 30 percent stand of legume in the pasture can supply 30 to 50 pounds of nitrogen per year to the grasses in the pasture. The cycling of nitrogen from urine, manure, dead plants, etc. may supply an additional 15 to 30 pounds of nitrogen per year depending on cow numbers and frequency of grazing.

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Persistence of grazed red clover varieties

Heathcliffe Riday and Michael Casler, US Dairy Forage Research Center, and Arin Crooks and Tim Wood, UW Lancaster Agricultural Research Station

Red clover (*Trifolium pratense*) is an excellent forage legume for grazing systems. Red clover has good seedling vigor, and broad establishment versatility, and it is a great pasture protein source. Historically, red clover has been limited by its lack of stand persistence in hay and grazed systems compared to other small-seeded forage legumes. Breeding over the past 50 years has extended red clover persistence in a hay management system to four years (Smith, 2000). No trials, however, have examined the grazing tolerance of the red clover varieties released during the past 50 years.

To address this lack of information, we conducted a red clover grazing trial at the UW Agricultural Research Station at Lancaster, Wisconsin. Over fifty varieties of red clover were included in the trial. Each variety was seeded in mixture with 'Barlexa' tall fescue (*Lolium arundinaceum*) in April 2004. Seeding rates were 9.6 lbs. per acre of pure live red clover seed and 10 lbs. per acre of 'Barlexa' tall fescue. (Mention of trade names or commercial products in this publication is solely for the purpose of providing specific information and does not imply recommendation or endorsement by the U.S. Department of Agriculture.)

Beginning in June 2004, the stands were rotationally grazed when the forage was between 12" and 15" tall.

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Fertilizer management *... from page 2*

While this is significant, recent University of Wisconsin research showed a positive economic return with up to 100 pounds of nitrogen fertilizer per acre applied to mixed pastures (http://www.uwrf.edu/grazing/PNNitrogen.pdf).

Fertilizing with nitrogen is a short-term management tool since its effect is usually immediate and does not last more than one grazing cycle. Additions of nitrogen fertilizer may cause a shift to more grass content in the year of application and beyond.

Last, but not least, do not forget about the soil pH. If there are mainly grasses present in your pastures, a soil pH of 5.8 to 6.0 should be adequate. A slightly higher soil pH of 6.3 to 6.5 is desirable if you have mixed grass/legume pastures. This higher pH will help the legumes persist longer in the pasture.

Before establishing a pasture, apply lime at the recommended rate and incorporate into the plow layer at least six months to one year before pasture seeding. If greater than 6 tons per acre of lime is recommended, apply 50% of the lime before working the field. Apply the remaining 50% after plowing or other field preparations and then disk into the soil.

Although working the lime into the plow layer is the most desirable, this is not practical for established pasture situations. Topdressing lime to established pastures will still be beneficial over time. Surface application of lime without incorporation will only move about 1/4 to 1/2 inch per year through natural processes. The rate of movement depends on the soil texture and fineness of the lime applied. Use as fine a grade of lime as you can obtain. You may need to topdress 1.0 to 1.5 tons per acre of lime every few years until the desired soil pH is reached.

Red clover varieties *... from page 3*

Grazing lasted 24 hours with 40,000 lbs. per acre of cow-calf pairs grazed on the pasture. In 2004 and 2005, the grazing events occurred at four-week intervals. In 2006, the rotation was tightened by increasing grazing frequency to three weeks between grazing events in order to increase grazing stress on the pasture plants. Pasture red clover stand counts (plants per square foot) were measured in July, 2004 and in May and October, 2005 and 2006.

Based on our study, the percent of red clover ground cover can be estimated from the stand counts using the following formula: % Ground Cover = 11.75 x Plant per sq. ft. – 4.47. Using this formula, 100% red clover ground cover is observed when there are nine or more red clover plants per square foot.

Table 1 on pages 5 and 6 provides a ranking of red clover varieties based on plant counts taken in October, 2006; this was 30 months after planting in April, 2004. Bolded varieties in Table 1 are historic benchmarks for the state of Wisconsin. These start with: 1) **wild red clover**, collected from Europe and Asia; 2) **Wisconsin Common**, seed grown and sold by farmers in Wisconsin prior to the 1960s; 3) **'Lakeland'**, a variety released in 1961; 4) **'Arlington'**, a variety released in 1973; 5) **'Marathon'**, a variety released in 1981; and 6**) C328**, a US Dairy Forage Research Center experimental variety currently in preparation for release (Fig. 1, page 7). Also included in Table 1 are the best performing US Dairy Forage Research Center experimental red clover populations under development; these represent red clover varieties that may be available in the future.

A broad range of grazing tolerance was observed among varieties. Although there is a clear increase in the 30-month persistence of the benchmark varieties over time, the same cannot be said of red clover varieties in general (Fig. 2, page 7). This indicates that relying on newer red clover varieties for grazing tolerance is not enough. Fifty years of red clover breeding, however, has led to a clear increase in plant establishment density among the benchmark varieties as well as varieties in general (Fig. 3, page 8). The increase in red clover plant establishment density has a strong effect on red clover plant densities at 13 months after planting and then slowly weakens as time moves forward (Fig. 4, page 8). Even after 30 months, 18% of red clover persistence can be accounted for due to improved plant establishment densities. This result shows that achieving good stand establishment will lead to increased stand persistence in the short and medium term, and that improved establishment can be achieved by choosing modern varieties that have been improved over the past 50 years.

Red clover plant yields were not measured directly in this study; however, plant height and a visual stand vigor score were taken. Red clover stand vigor has increased slightly in newer varieties, while plant height has not increased in 50 years of breeding. Red clover vigor is more related to 30-month plant counts (42%) than plant height (13%). This implies that having greater red clover plant densities in the stand will increase stand vigor rating more than by having taller-growing plants in the stand.

References: Smith, R.R. 2000. "Red Clover in the 21st century." In *Proc. 24th Forage production and use symposium*. Wisc. Forage Council. Available at http://www.uwex.edu/ces/forage/wfc/proceedings2000/ smith.htm

Red clover varieties ... *from page 4*

Table 1. Persistence, vigor, and height of red clover varieties planted in April 2004 in mixture with tall fescue and rotationally grazed for 30 months following planting at the Lancaster, WI, Agricultural Research Station (sorted by red clover plant density at 30 months after planting [October 2006]).

Variety Name	Year[a]	Source	Red Clover Plant Density					Plant Vigor	Plant Size
			2004	2005		2006			
			Jul	May	Oct	May	Oct		
			plant/sq. ft.					score[b]	inch.[b]
C276	1991	USDFRC, USDA-ARS, Exp.	24.3	13.5	9.2	7.7	5.8	3.1	9.9
WI21	*[c]	USDFRC, USDA-ARS, Exp.	24.1	11.3	8.3	7.2	5.3	3.5	10.8
HC64 Fus1	1992	USDFRC, USDA-ARS, Exp.	26.0	10.4	8.1	7.2	5.3	3.7	10.8
HC56	1990	USDFRC, USDA-ARS, Exp.	16.9	11.6	8.1	7.4	5.1	3.3	9.7
HC83	1999	USDFRC, USDA-ARS, Exp.	27.5	10.0	9.4	8.1	5.0	3.6	10.4
C288	1991	USDFRC, USDA-ARS, Exp.	23.0	9.4	7.8	6.4	4.6	3.2	10.8
WI25	*	USDFRC, USDA-ARS, Exp.	16.5	8.9	7.8	6.9	4.5	3.3	9.6
C604	*	USDFRC, USDA-ARS, Exp.	18.3	10.1	7.7	7.5	4.5	3.8	9.7
RedlanGraze	1999	ABI Alfalfa	25.0	12.8	8.9	7.9	4.4	3.8	10.2
HC78	*	USDFRC, USDA-ARS, Exp.	14.3	10.6	8.4	7.3	4.4	3.3	10.4
Plus	1998	Turner Seed	20.8	14.5	7.7	8.0	4.2	3.4	11.0
C452	*	USDFRC, USDA-ARS, Exp.	14.2	7.9	8.4	7.1	4.2	2.6	10.7
C584	1999	USDFRC, USDA-ARS, Exp.	22.4	7.9	8.2	5.9	4.2	3.0	9.9
WI52	*	USDFRC, USDA-ARS, Exp.	20.1	11.7	8.2	6.9	4.1	4.0	9.8
C328	**1992**	**USDFRC, USDA-ARS, Exp.**	**20.7**	**11.4**	**8.3**	**7.5**	**4.1**	**3.6**	**10.9**
C589	*	USDFRC, USDA-ARS, Exp.	26.7	13.3	8.5	8.0	4.1	3.8	10.4
Duration	2000	La Crosse Forage & Turf /Cisco Co.	15.3	8.2	7.4	6.3	4.0	3.7	11.2
Starfire	1994	Cal/West - Ampac Seed Co.	18.4	9.0	7.6	5.7	4.0	3.3	10.2
C457	*	USDFRC, USDA-ARS, Exp.	24.4	11.5	6.7	2.6	4.0	1.5	8.9
C607	*	USDFRC, USDA-ARS, Exp.	16.2	10.9	9.2	7.3	4.0	3.4	10.0
Freedom!	1996	Univ. of KY, Barenbrug USA	16.2	8.2	7.9	6.4	4.0	3.0	12.1
Impact	1999	Specialty Seeds	15.4	9.1	7.6	6.9	3.9	3.1	10.3
Kenland	1951	Univ. of KY	20.9	11.1	7.4	7.7	3.9	3.6	12.4
Acclaim	1989	FFR/Southern States	21.2	9.2	6.8	6.3	3.8	3.1	10.3
Belle	1999	Pickseed Canada / Agribiotech	22.6	11.9	9.0	7.3	3.8	3.3	10.0
Wildcat	1995	Dairyland Seed	18.1	8.5	8.2	7.2	3.7	2.9	9.3
Robust II	2001	Seed Mart /Seed Res. of Oregon	19.9	11.8	7.2	5.6	3.7	2.9	10.5
RedlanGraze II	2001	ABI Alfalfa	21.6	12.8	8.5	7.2	3.7	3.2	9.6
Red Gold	1996	McDaniel Ag. Corp. / Turner Seed	25.0	12.4	8.1	7.9	3.7	3.6	10.0
Flare	1979	ABI Alfalfa	8.3	5.1	5.5	4.7	3.7	1.8	10.2
Randolph	1994	FFR/Southern States	23.6	9.9	7.6	7.5	3.7	3.5	11.4
Marathon	**1981**	**USDFRC, USDA-ARS/Unv. of WI**	**16.4**	**8.2**	**7.2**	**7.1**	**3.6**	**3.6**	**10.9**
Robust	1996	Seed Mart	16.4	9.1	7.5	6.5	3.6	3.1	10.0
RedGold Plus	2000	ProSeeds / Turner Seed, Inc.	18.5	9.9	7.6	6.1	3.6	3.3	9.8
Cinnamon Plus	1999	FFR/Southern States	24.6	10.3	8.9	8.0	3.6	3.7	10.4
Cardinal	2003	NC+ Organics	22.3	10.1	8.8	7.7	3.6	3.7	10.8
Chippewa	2000	Elk Mound Seed	15.8	9.9	6.7	5.6	3.5	2.8	9.2
Ram	1995	ABI Alfalfa	19.4	12.9	7.5	5.8	3.5	3.4	10.4
Royal Red	1998	Land O' Lakes	19.1	5.5	5.8	5.3	3.5	3.0	10.5
Tristan	1973	Stanford Seed	13.7	8.3	7.5	4.8	3.5	2.3	9.1
Cinnamon	1988	FFR/Southern States	16.4	8.4	7.5	6.1	3.5	3.1	11.0
Redstart	1991	Northrup-King	21.2	11.6	6.9	7.6	3.3	3.6	11.0
Scarlett	1989	Dairyland Seed	21.2	9.8	7.1	6.8	3.2	3.6	10.4
Reddy	1982	FFR/Southern States	14.9	10.2	6.7	4.0	3.2	2.8	10.6
Ruby	1980	Dairyland Seed	17.4	7.4	7.4	6.6	3.2	3.1	11.0
Florie	1973	Northrup-King	12.3	2.5	5.8	5.6	3.1	1.7	10.6
Lakeland	**1961**	**USDFRC, USDA-ARS/Unv. of WI**	**13.9**	**5.9**	**6.5**	**4.9**	**3.1**	**2.8**	**10.4**
Renegade	1994	International Seeds / Green Seeds	18.2	10.4	6.8	6.1	3.0	3.1	11.0

a – First year variety planted in a state variety trial.
b – Plant vigor and height based on two measurements in July 2004 and May 2005; vigor score, (5) most vigorous, (1) least vigorous.
c – * USDFRC experimental red clover populations, never before entered in state variety trials.
d – ** Wisconsin common red clover; seed sold and produced by farmers in Wisconsin in the 1950's.

Table 1, continued. Persistence, vigor, and height of red clover varieties planted in April 2004 in mixture with tall fescue and rotationally grazed for 30 months following planting at the Lancaster, WI, Agricultural Research Station (sorted by red clover plant density at 30 months after planting [October 2006]).

Variety Name	Year[a]	Source	Red Clover Plant Density					Plant Vigor	Plant Size
			2004	2005		2006			
			Jul	May	Oct	May	Oct		
			plant/sq. ft.					score[b]	inch.[b]
AC Endure	1997	Agri. and Agr. Food Canada	18.6	10.3	6.8	5.3	3.0	2.4	8.8
Emarwan	1995	Agri. Alternatives/ Turf Seed, Inc.	21.4	7.6	6.8	5.4	2.9	3.3	10.1
Juliet	1999	Brett-Young Seeds	22.8	11.5	7.6	6.1	2.9	3.3	10.5
Astred	1995	Wrightson Seeds	9.6	5.3	5.4	3.9	2.8	2.2	8.7
Rajah	1999	Russia	13.8	8.6	6.6	4.6	2.7	2.4	8.0
Narn	1999	International Seeds	18.3	9.2	6.7	6.2	2.6	2.9	10.9
Concorde	1988	ABI Alfalfa	16.2	9.5	7.3	6.3	2.6	3.2	10.8
Atlas	1979	Northrup-King	20.4	8.3	7.5	6.8	2.5	3.1	10.7
E689	1976	FFR/Southern States	16.8	7.7	6.7	4.6	2.4	2.8	10.4
Start	1996	Barenbrug USA / TFI	25.7	10.2	7.7	5.9	2.4	2.9	10.7
Joy	1975	Teweles Seed	10.3	4.8	5.1	5.5	2.4	2.2	11.1
Chesapeake	1958	Southern States	17.3	10.1	6.2	5.5	2.3	2.5	10.9
Walter	1991	Pickseed Canada	11.9	6.4	6.8	5.9	2.3	2.7	10.9
Cherokee	1993	Unv. of FL	25.5	9.2	6.3	4.4	2.3	2.9	10.4
Norlac	1977	Agri. and Agr. Food Canada	14.9	4.9	4.6	3.0	2.3	1.6	6.8
Marino	1987	Stanford Seed	15.2	10.4	7.0	5.5	2.3	2.9	10.1
Tyrant	1998	Western Production	14.7	8.3	6.3	4.7	2.3	2.2	10.7
Arlington	**1973**	**USDFRC, USDA-ARS/Unv. of WI**	**18.5**	**7.9**	**6.2**	**5.0**	**2.2**	**2.7**	**10.2**
AC Charlie	1997	Agri. and Agr. Food Canada	25.7	9.7	8.3	5.3	2.2	3.1	11.2
Sienna	2001	Great Plains Research Co.	15.2	10.7	6.5	4.9	2.1	2.9	11.1
Solid	1998	Production Service Int.	20.0	9.2	6.5	5.5	2.0	3.0	11.6
Pennscott	1953	Southern States	16.5	8.2	5.4	3.2	1.9	2.2	10.2
Redman	1973	FFR/Southern States	9.7	3.8	4.9	4.0	1.9	1.5	9.6
Beskyd	1997	DLF-Jenks	21.0	8.8	4.9	4.3	1.8	2.5	10.4
AC Kingston	1997	Agri. and Agr. Food Canada	15.8	8.1	6.8	4.5	1.8	2.3	9.7
WI Common	****[d]**	**Wisconsin Collections 1950's**	**15.5**	**8.4**	**5.9**	**4.2**	**1.8**	**2.5**	**10.5**
Mor Red	1980	ABI Alfalfa	8.9	5.6	3.5	2.8	1.5	1.5	9.1
Tempus	1999	Pickseed Canada	15.2	6.5	4.1	3.1	1.4	1.7	9.3
Vesna	1998	DLF-Jenks	7.1	3.4	2.4	2.3	1.4	0.9	8.5
Dolina	1997	DLF-Jenks	14.5	5.8	5.5	3.9	1.4	2.3	8.9
Wild Red Clover	*******	**Old World Collections**	**22.9**	**5.9**	**3.9**	**3.2**	**1.2**	**1.9**	**8.4**
Tomani	1998	DLF-Jenks	22.0	7.6	4.4	3.5	1.1	2.3	9.0
Gorby	1999	Newfield Seed	13.3	7.4	5.7	3.6	0.7	2.5	8.9
Fox	1987	Stanford Seed	10.2	4.9	3.8	3.3	0.6	1.8	10.0
LSD ($p < 0.05$)			9.3	4.3	1.9	1.8	1.5	0.7	1.5
CV%			37.0	34.6	20.4	24.0	38.4	17.7	10.9

a – First year variety planted in a state variety trial.
b – Plant vigor and height based on two measurements in July 2004 and May 2005; vigor score, (5) most vigorous, (1) least vigorous.
c – * USDFRC experimental red clover populations, never before entered in state variety trials.
d – ** Wisconsin common red clover; seed sold and produced by farmers in Wisconsin in the 1950's.

Figure 1. Thirty (30) months post-planting persistence of benchmark red clover varieties representing 50 years of breeding in Wisconsin (wild red clover, from European and Asian collections; Wisconsin common, seed produced and grown by farmers in the 1950s; 'Lakeland', a variety released in 1961; 'Arlington', a variety released in 1973; 'Marathon', a variety released in 1983; and C328, an experimental red clover population in preparation for release) grown in mixture with tall fescue and rotationally grazed at the Lancaster, WI, Agricultural Research Station.

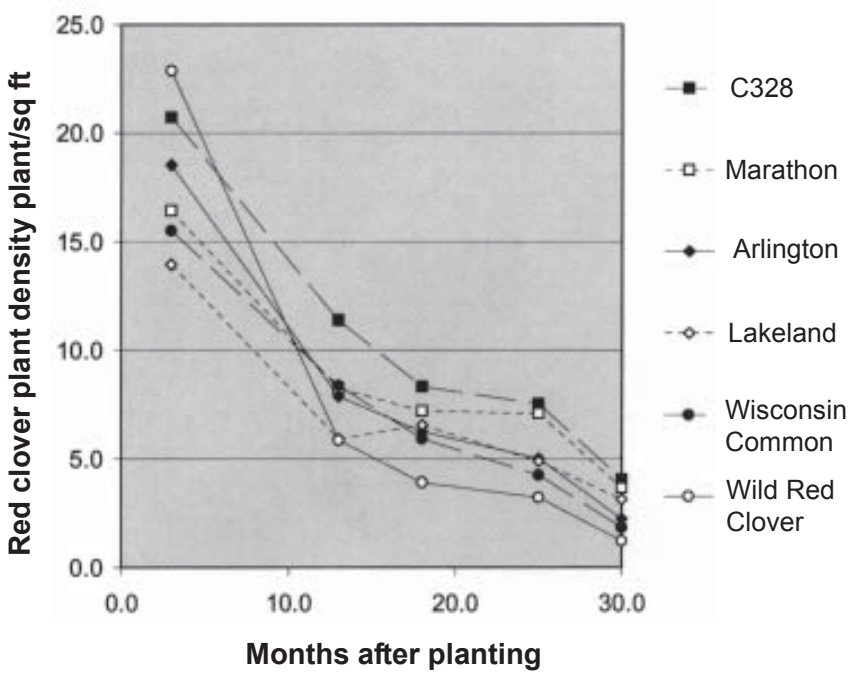


Figure 2. Plant densities of red clover varieties released in the past 50 years grown in mixture with tall fescue after 30 months of rotational grazing at the Lancaster, WI, Agricultural Research Station.

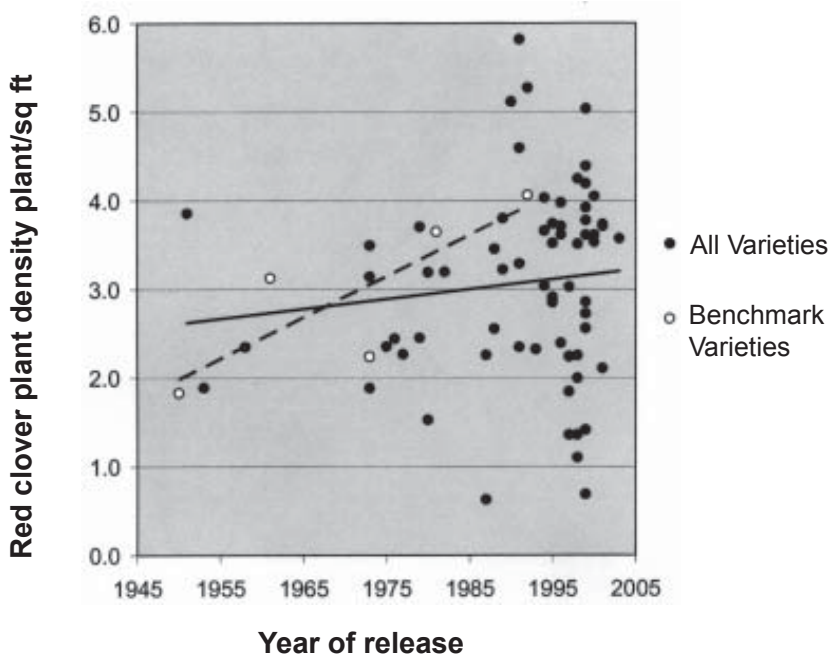


Figure 3. Establishment plant densities of red clover varieties released in the past 50 years grown in mixture with tall fescue 3 months after seeding at the Lancaster, WI, Agricultural Research Station.

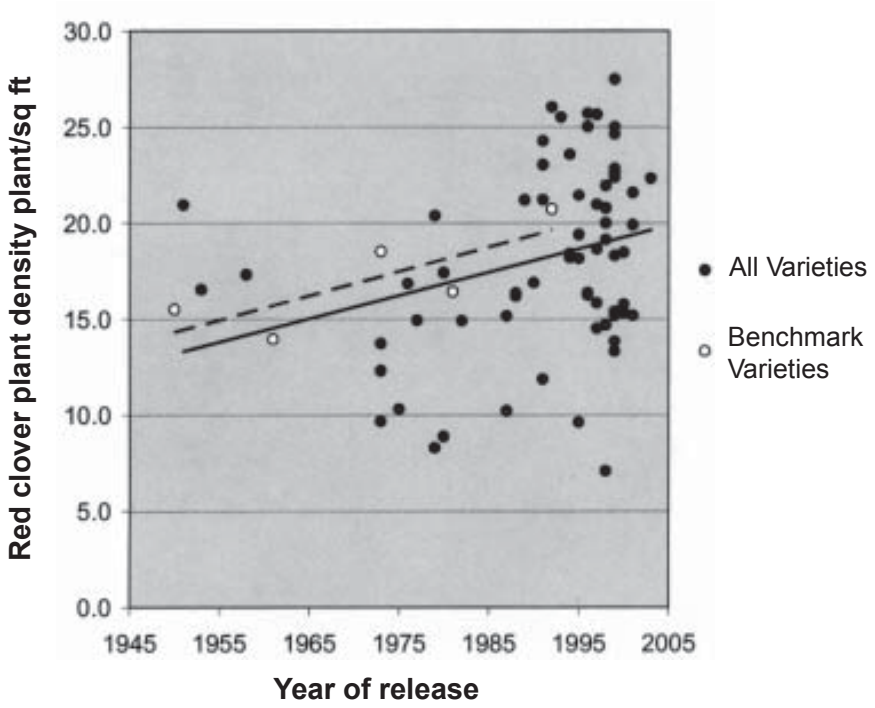
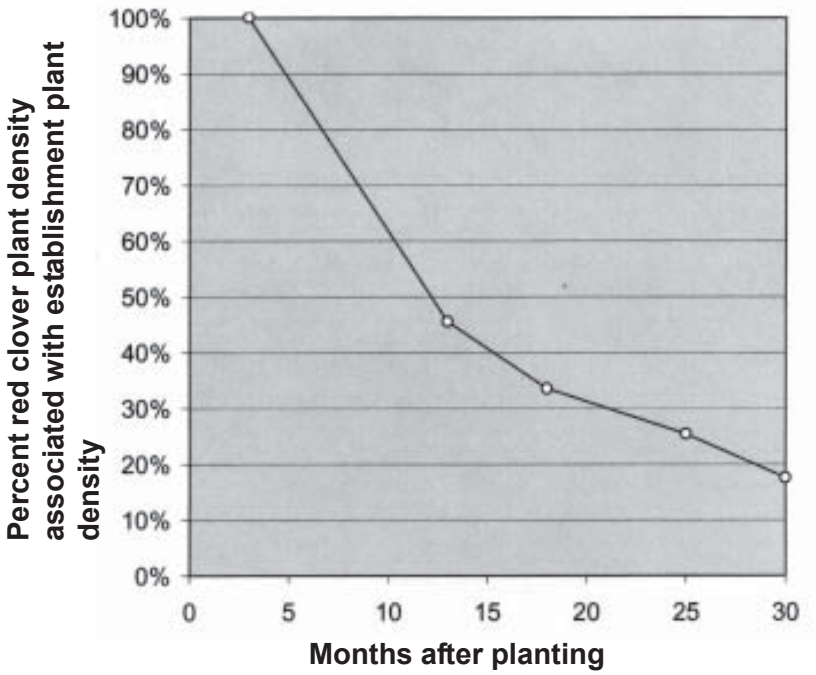


Figure 4. Percent of red clover plant density grown in mixture with tall fescue and grazed rotationally over 30 months associated with establishment plant density measured 3 months after planting in April 2006 at Lancaster, WI, Agricultural Research Station.



Carbon crediting for agricultural soil management practices

Sara Walling, Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP)

The Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) has joined with the National Farmers Union (NFU) to facilitate a carbon trading program for Wisconsin. Farmers, foresters and landowners can generate tradable carbon credits by participating in carbon sequestration projects. These projects sequester, or trap, carbon underground so it cannot be released into the atmosphere as carbon dioxide (CO_2), one of several greenhouse gases that trap heat from the sun and may cause average global temperatures to rise over time. Projects include:

- Conservation tillage
- No-till
- Strip-till
- Ridge-till
- Anaerobic Digestion
- Reforestation/Afforestation
- Conservation Management Practices
- Grassland plantings

The Chicago Climate Exchange (CCX), the nation's first voluntary greenhouse gas emissions trading platform, helps to reduce the amount of greenhouse gases in the atmosphere through the sale of carbon credits. Each project/practice generates a CO_2 credit equivalency that is then sold to members who wish to offset their emissions. The number of credits generated varies by project, but ranges between 0.5 and 0.75 credit/acre for soil projects. Credits are currently selling for about $3.50 each. Farmers can participate in CCX by registering their projects with an approved aggregator. Aggregators compile credits from numerous projects and manage trading on the Exchange. NFU recently received CCX approval to aggregate Wisconsin offset projects, and nearly 16,000 acres of conservation tillage have already been registered.

The approved projects offer additional benefits for the farmer or landowner. Conservation tillage can increase crop yields, reduce the number of times operators access the field, and save an average of 3.5 gallons of fuel per acre annually. In addition, the approved practices can also improve water and air quality by reducing soil erosion and creating riparian buffers along rivers and streams.

Currently, 28 counties in Wisconsin are approved to participate in conservation tillage and grassland planting offset projects. Other offset projects, such as anaerobic digestion and reforestation, do not have geographic limitations. A minimum four-year contractual commitment must be made and verification that conservation practices are being conducted may occur during the contract period.

Selling carbon credits for acres already or soon to be under conservation tillage or seeded grassland is a great way to increase farm income while improving environmental quality. For more information or to get started, please go to the Wisconsin Farmers Union website: www.wisconsinfarmersunion.com

Upcoming events

"Profitable Pastures for Southwest Wisconsin"
Winter Discussion Series, UW Lancaster Agricultural Research Station. All meetings at 1 pm on dates listed.
February 13, 2007: History repeats itself: Good management now makes future management easier. Geoff Brink, Research Agronomist, UW Dairy Forage Research Center. Grazing management to influence pasture density and productivity.
March 13, 2007: Breeding and selection of pasture legumes. Heathcliffe Riday, Legume Research Geneticist, US Dairy Forage Research Center. How plant breeders design pasture legumes for improved production, quality and persistence under grazing conditions.
To register: Contact Rhonda Gildersleeve, 608-935-0391 e-mail rhonda.gildersleeve@ces.uwex.edu or contact Arin Crooks, 608-723-2580 e-mail aecrooks@wisc.edu

Issues and opportunities for the Wisconsin grazing community: A needs assessment, 2006

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Background and methods

The new grazing program at the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) seeks to provide statewide coordination of activities to promote the use of well-managed pasture systems among Wisconsin dairy and livestock producers. One of my first objectives has been to listen to farmers and build a program that is responsive to their needs, goals and aspirations.

To this end, I organized a series of listening sessions with grazing networks across Wisconsin. As of December 2006, we have heard from a total of 180 farmers from eight networks in western and central Wisconsin from Spooner in the north to Lancaster in the south and east to Columbia and Dodge Counties (Table 1). Sessions still need to be conducted in southeastern and northeastern Wisconsin.

Our goal with these listening sessions has been to have farmers look beyond the farm gate and think about what needs to happen to get the end product on the consumer's plate. We asked them to think about what their industry could look like in 5 or 10 years if we concentrated our resources on this big picture and on long-term goals and opportunities.

Participants were given pens and post-it notes and had five to ten minutes to write down one or more of the most critical issues, or best ideas they have to move the industry toward that long-term vision. Then each participant was given a chance to share their thoughts verbally. The post-it notes (one 'idea' per note) were placed adjacent to the appropriate 'link' on a supply chain diagram. Once all the ideas and issues were placed on the diagram, participants ranked their importance by voting. Each person was given five votes and allowed to vote for five separate topics or place multiple votes on one or more topics.

We combined the issues and ideas generated across all sessions and grouped them by subject matter. Votes were tallied across sessions. The value of this type of approach is that it allows for unstructured thinking and creativity. The disadvantage is that the results tend to be hard to quantify. Some statistics are given, but the focus of this summary is to capture broad concepts and to share some of the ideas we generated.

Table 1. Locations, dates and participation in DATCP listening sessions

Location	Date	# of participants
GrassWorks Board	4/26/06	15
Columbia-Dodge Pasture walk	5/10/06	12
Ocooch Graziers	6/21/06	20
Central Wisconsin/ Marshfield Field day	6/29/06	30
Coulee Graziers	8/1/06	10
Lancaster Pasture Day	8/11/06	40
Sheep & Wool festival	9/9/06	35
North West Graziers	10/26/06	29
Total		176

Results

Among the eight sessions, we ended up with 223 separate topics, and a total of 681 'votes' with a range of one to eleven votes for each topic. The issues can be grouped into the three broad 'links' in the supply chain: 1) farm production of meat or milk, 2) product development and processing, and 3) marketing and consumer education. Production issues had the highest number of topics and votes overall, 30% of total (Fig. 1, page 11), followed by marketing issues with 25%. Processing issues garnered about 19% of the votes. The remaining votes—about 25%—went to a category we titled "policy issues." This group of issues and ideas deals with the broader goal of gaining greater acceptance and utilization of pasture-based livestock and dairy systems in the state, and what we can do to promote that.

Production issues: Improving efficiency of grazing farms

Within the general category of production, we grouped participant responses into five areas of concern: pasture management, animal management and genetics, conservation/soil/

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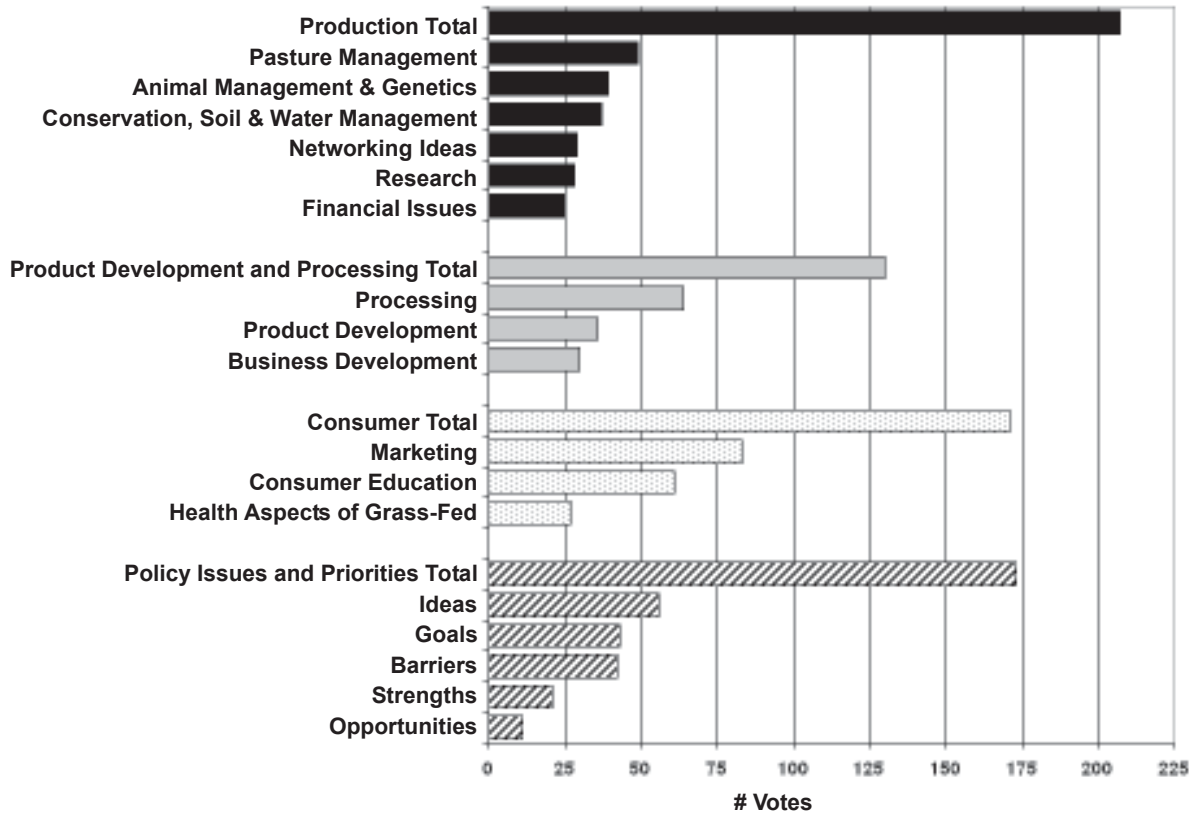
Figure 1. Breakdown of Focus Group Session Responses (# of votes)



water issues, financial issues, and networking. Producers also expressed their views regarding grazing research in general, a topic which accounted for about 14% of the votes under the production heading (Fig. 2, page 12).

Pasture management: Specific pasture management issues were discussed at seven of the eight sessions, receiving 23% of the production-related votes. Weed control continues to be an issue of importance to grass farmers (20 out of 49 votes). With the grazing behavior of sheep sometimes leading to greater weed problems, it's not surprising that sheep producers represented a relatively large proportion of these votes.

Other pasture management issues covered a broad range of topics, from very elementary needs such as stocking rates to more advanced interests such as extending the grazing season and developing silvo-pasturing strategies. The bulk of the topics were associated with developing greater skills as pasture managers.

Idea: *Develop a statewide system of sharing timely seasonal pasture forage quality information similar to the alfalfa scissors clipping program for hay cutting.*

Animal management and genetics: Producers at six of the eight sessions identified livestock-related issues, accounting for about 19% of the votes on production issues. Among these, almost half expressed a need for more information on animal genetics, including breeding for traits important for pasture systems, and specifically for finishing beef on pasture. Research on crossbreeding in dairy was another topic of interest.

Two other needs identified in this area were cattle nutrition, including balancing rations on pasture for different development stages in dairy cattle, and developing educational resources for alternative livestock and multi-species grazing systems. Predator control was identified as a key issue by sheep producers at the Sheep and Wool Festival.

Conservation, soil, and water management: Conservation topics were identified at six of the sessions and accounted for about 18% of the production votes. The cost of energy was on the minds of many graziers, with the high price of fuel and petroleum-derived products this season. Documenting and capitalizing on

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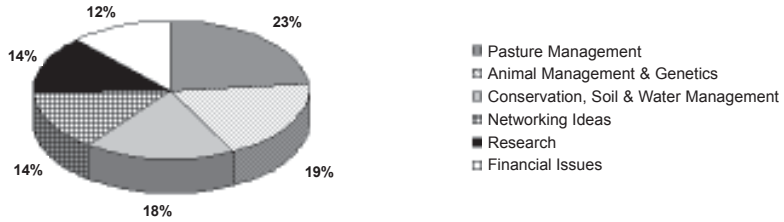
the conservation value of grazing was suggested by a number of individuals at several sessions. Other topics included the need for information regarding soil fertility management. Irrigation was another topic identified as an education and research need.

Figure 2. Production Issues



Financial issues: Financial topics comprised only 12% of the total issues in the production category. Individual topics within this area included helping farmers develop production budgets, determine break even points and generally develop better business decision-making skills. Several participants expressed an interest in educational programming on making the transition to organic production, and information on the requirements of value-added opportunities for grass-based dairy processing.

Research Question: *One interesting idea involved developing a framework for incorporating weather-related factors into business planning. As climate change plays an increasingly important role in pasture management, integrating weather-related factors into management decisions will become critical to making economically sound pasture management decisions.*

Grazing research: In addition to specific research topics, graziers identified grazing research—continued and improved—as an important issue at five of the sessions (14% of votes in the production category). Participants perceived a disconnect between graziers and researchers, and a need for better-coordinated and prioritized research. Many expressed support for on-farm research as opposed to research station trials.

Networking ideas: Ideas for sharing resources within the grazing community garnered the highest number of votes in the sessions where they were suggested. All of these networking projects could be coordinated through a centrally managed, web-based database, either at the state or regional level (perhaps through the RC&Ds).

- Develop equipment loan pools for networks or groups of farmers, so that the cost of maintaining implements such as no-till drills, deep tillage equipment, livestock scales, and other equipment can be shared among farmers. There are several good examples of grazing networks sharing these costs.
- Develop a network connecting farmers needing pasture acreage with landowners with land to rent. Some non-farming rural landowners in many parts of Wisconsin may welcome renting to a grazier as an alternative to renting for row crop production.
- Develop a means of networking various types of producers whose enterprises complement each other, such as connecting beef backgrounders with finishers or dairy farms with heifer raisers.

Processing and product development issues

Of the 681 total votes, 130 or 19% fell within the processing and product development category. We grouped these issues into processing (49%), product development (28%) and business development (23%).

Expanding processing capacity: By far, the most important issue within this category was meat processing. The most important issue brought up at six of the eight sessions was the need for more local slaughter facilities for direct marketers of all livestock classes, especially for poultry. There are only a few processing facilities in Wisconsin for poultry, and most of the larger operations (>1000 birds) utilize a processor in Iowa. Options are even more limited for organic producers. Interest was expressed in developing capacity for specialty processing such as kosher and halal.

State inspected processors are used by the majority of direct market livestock and poultry producers, and participants were aware of the impediment that interstate sales restrictions create for Wisconsin meat marketing. At three sessions, several people indicated that legalizing interstate sales of meat processed at state inspected plants would be of benefit to their businesses.

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One issue that is of particular concern to sheep producers is the fact that many processors will not dispose of offal from lamb carcasses out of a (perhaps unnecessary) concern associated with a possible scrapie/BSE connection. This puts some sheep producers in the position of having to bring offal back for disposal on their farms. As these businesses grow, this will become an increasingly important hindrance, as well as a potential biosecurity problem, on the farm.

Product development ideas : Participant responses reflected an awareness of the potential for grass-based meats and dairy as specialty products in the marketplace. They expressed a need for additional research to quantify the perceived differences in grass-fed products and there was strong support for education of processors, retailers, and other 'middle links' of the supply chain as to the unique qualities of grass-fed dairy and meats. Other topics of interest included development of artisan dairy and meat products and the need for farmers to gain a better understanding of how their raw products are processed, as well as how their management affects the final product. Other product development ideas included an interest in developing markets for specialty wool products, and research into (and legalization of) raw milk.

Business development: At six of the sessions, producers expressed interest in funding and/or technical assistance to organize marketing cooperatives or other business structures that would allow farmers to pool products to capture premiums in the marketplace. A Wisconsin Grass-Fed branding approach was suggested at three sessions.

Building a market for grass-based products

When asked to think about the broader supply chain that they participate in, producers shared relatively well-developed thoughts about what a 'grass-based' supply chain might look like. Participants recognized some of the challenges grass-fed products face in the marketplace.

About 60% of participants felt that market development was a critical issue in building a 'grass-fed' supply chain, with responses including everything from differentiation of the products to the cost of shelf space to concerns over 'grass-fed' developing some of the problems that organic products have with commercialization.

At seven of eight sites, there was discussion of the public's lack of general knowledge of where their food comes from. There was also a recognition that consumers may not be aware of the difference between grass-based livestock systems and the conventional confinement systems that have developed. If 'grass-fed' is going to be promoted as a better alternative to the conventional system, we will first need to educate consumers as to what the conventional system is and what its challenges are.

Producers recognized the power of 'putting a face on a product' by having the farmers promote their own products. Most participants saw value in promoting grass-fed products from many angles: environmental performance, family farmer friendly, local, etc. In two of the networks, the health aspects of grass-fed (CLA, Omega 3 fatty acid) were well known and considered a worthwhile consumer education topic (27 of 135 responses). But there was also recognition in three of the sessions that more market research is needed, and the development of this market should be based on a good understanding of what the consumer wants.

Characteristics of a grass-fed supply chain

Compiling the issues and suggestions shared, we can construct a picture of what an alternative market for grass-fed products might look like. The following are characteristics that were shared by producers around the state:

- Local markets for Wisconsin grass-fed dairy and livestock products. Participants expressed interest in cooperatively owned outlets for grass-fed products.
- Development of a Wisconsin grass-fed brand.
- Organization of farmers into marketing cooperatives to meet the demand of the market.
- Provide producers with a greater share of the price consumers pay for their products by shortening the supply chain.

Moving grazing forward in Wisconsin

Among all of the sessions, there was a strong consensus that pasture-based systems provide a broad array of benefits for both individual producers and for the Wisconsin public in terms of economic, environmental and social concerns. These topics were grouped into a 'policy' category and can be organized into goals, barriers, strengths, opportunities and ideas.

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Goals: Among the 173 votes in this policy category, 43 (25%) at six sessions involved goals for expanding the utilization of well-managed pasture in Wisconsin. Participants expressed interest in reaching out to conventional farmers as well as helping new farmers get started using pasture systems. There was a genuine interest in promoting grazing for the greater good of Wisconsin's dairy industry and agricultural economy.

Barriers: Two of the biggest barriers identified were the federal Farm Bill and USDA programs, which were viewed as being focused on support of commodity production. There was also a sense that many county governments are not supportive of grazing and that most government agencies, universities and agricultural organizations are under pressure to promote conventional agriculture and not diversification or alternative systems.

Strengths: With energy prices on the rise, the reduced use of fossil fuels in grazing-based systems was mentioned as a strength in several sessions. Participants expressed an awareness of financial, environmental and social benefits of increasing pasture utilization, not only for individual farmers but for Wisconsin's dairy industry and agricultural economy as a whole. At one session, an observation was made that grazing farms may have an advantage in terms of public perception of animal welfare issues.

Opportunities: Opportunities identified by participants included working with other organizations such as the Land Stewardship Project in Minnesota or the Midwest Forage Association to promote grazing. At several sessions, the growing carbon credit economy was viewed as a potential opportunity for graziers, as was the development of cellulitic ethanol production.

Ideas on promoting grazing through policy changes
The following are some of the many ideas shared by participants to promote pasture based systems through local, state and federal policy:

- Reorganizing federal farm programs or developing state programs with the following goals:
  - Limit grain production to the best ground.
  - Provide incentives for hay and pasture acreage.
  - Broaden the scope of programs like Grassland Reserve, which works like CRP but allows utilization of the land for grazing and hay production.
- Energy policy. Grazing could be incorporated into U.S. energy policy. Energy savings of pasture based systems could be documented and incentives paid to farmers to adopt this energy-efficient production system.
- Grass-based agriculture TIF districts. In one session, there was a suggestion that cities and villages could develop a Tax Incremental Financing (TIF) program to encourage grass-based farms to locate near these urban areas to provide low cost green space and environmental services. The TIF program could help farmers make the investments needed to upgrade or build facilities needed for their operations.
- Program to purchase development rights to help new farmers get started or to help the next generation take over an existing farm.
- County Land and Water Conservation Plans. Another interesting idea was for DATCP to work with county Land Conservation Departments to incorporate managed grazing into their land and water plans. This is a cost-effective best management practice that should be promoted by conservation agencies. Having technical assistance for these practices in each county would provide producers with the information they need to adopt them.

Conclusions

The Wisconsin grazing community is a vital, motivated group of farmers who have a vision for what their future could be. Across all of the listening sessions, the themes that stand out most clearly are the following:

- Differentiating the products of pasture based systems in the marketplace
- Improving and expanding processing capacity for small-scale direct-market livestock producers
- Organizing multi-farm cooperatives to pool products to access larger markets
- An ongoing need for basic and advanced grazing research and education
- Working with agencies to promote well-managed grazing systems to other farmers, and especially to beginning farmers in Wisconsin

In the coming years, we look forward to working with the grazing community, adding DATCP's resources to those of other agencies, the university and other organizations to achieve these recommendations. If you have questions, comments, or suggestions for our program here at DATCP, please contact Laura Paine at 608-224-5120 or laura.paine@datcp.state.wi.us.