Wisconsin's Grazing Networks: History, Structure, and Function

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ABSTRACT

Management intensive grazing (MIG) is an alternative livestock production system that involves producing the bulk of a herd's forage requirements from pasture. Grazing is managed to maximize the productivity of the pasture and reduce overall feed costs. In contrast to confinement systems, MIG involves feeding a complex mixture of fresh forage grasses and legumes characterized by frequent changes in quantity and nutritional quality. The skills needed to manage this system well are not easily learned via traditional sources of agricultural information. Livestock producers in Wisconsin have capitalized on the potential of farmer-to-farmer learning by forming numerous grazing networks throughout the state. In the fall of 1998, we conducted a survey of grazing network coordinators to evaluate the structure and management of grazing networks, types and effectiveness of activities undertaken, and how state and federal agencies are supporting and can support the networks' efforts without compromising their independence. Coordinators of all 23 Wisconsin networks were surveyed via mail or phone. Respondents were asked questions on the following topics: (i) network composition and size; (ii) structure and coordination; (iii) programming and activities; and (iv) challenges, concerns, and accomplishments. Responses suggest that grazing networks vary widely in their composition and structure, but share similar activities, interests, and concerns. Factors that influence the effectiveness of networks as a mechanism for farmer-to-farmer information exchange include regular communication, agency support, homogeneity, attention to the needs of both advanced and beginning graziers, and a personal commitment to the network on the part of individual members.

WISCONSIN'S dairy industry is in transition. Nationally, the industry is consolidating and updating technology, forcing Wisconsin's small, traditional family farms to adapt to changing economic and political realities (Jackson-Smith, 1996; Barham et al., 1995). One adaptation growing in popularity among dairy producers is management intensive grazing (MIG), which can result in reduced forage costs by replacing mechanically harvested hay with fresh pasture forage during the growing season (Undersander et al., 1993). In 1998, more than 22% of Wisconsin's dairy farmers, as well as smaller percentages of beef (*Bos taurus*), sheep (*Ovis aries*), and other livestock farmers were using some form of MIG (D. Jackson-Smith, 1999, personal communication).

The MIG concept is simple—use the animals to harvest their own feed and spread their own manure back on the land. But many farmers have found that, in practice, MIG is a complex, ever changing interaction among climate and weather, soils, pasture plant communities, livestock, existing infrastructure, and individual managers. By nature, successful application of MIG depends on local knowledge and involves adapting basic scientific principles to specific circumstances (Rittmann, 1994; Hassanein, 1997). Practitioners of MIG focus on pasture management and consider themselves "grass farmers"; in the words of one grazier, the grazing network is "a photosynthesis users group" (D. Patenaude, 1997, personal communication).

Traditional sources of agricultural information such as the Cooperative Extension Service, newspapers and magazines, state and federal farm agencies, and local farm suppliers and cooperatives may have historically been unable to provide the specific types of information needed by farmers making the transition to MIG (Suppe, 1987). In Wisconsin, farmers have looked to one another for support through the vehicle of grazing networks. Since Wisconsin livestock farmers began using MIG in the late 1970s, the grazing movement has been very much a farmer-driven, farmer-led movement. Wisconsin's grazing networks, many originally organized by graziers, have been at the core of this movement, reflecting the independence and diversity of grass farmers throughout the state. The objectives of this network coordinators' survey were to learn how networks are structured and managed, the effectiveness of different types of activities, and how agencies can support the networks' activities without compromising their independence.

MATERIALS AND METHODS

During fall of 1998 we surveyed the 23 existing Wisconsin grazing networks. The two-page survey included 19 questions and was mailed to the coordinator of each network. Those coordinators who did not return the survey within 2 mo received a phone call and were surveyed via telephone. This process allowed us to collect responses from all 23 coordinators.

Survey respondents were asked questions on the following topics: (i) network composition and size; (ii) structure and coordination; (iii) programming and activities; and (iv) challenges, concerns, and accomplishments. Network composition and size questions included how and when their network was started, the number of members and number of counties served by their network, stock classes represented among their members, as well as more subjective questions such as estimates of the proportion of *active* members (those who regularly participate in activities and/or play an active role in organizing and conducting activities). Structure and coordination topics focused on farmer vs. agency coordination and the types and amounts of agency support received. Programming and activities topics involved listing activities, estimates of at-

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Abbreviations: MIG, management intensive grazing; SWFRN, Southwest Wisconsin Farmers' Research Network; NRCS, Natural Resource Conservation Service; GLCI, Grazing Lands Conservation Initiative; LCD, land conservation departments; SARE, sustainable agriculture research and education; USDA, U.S. Department of Agriculture.

Table 1. Groupings of attributes that affect network structure and function. Naturally occurring categories used for the four groupings of networks: farmer vs. agency coordination, network size (no. of active participants), percent active membership, and percent dairy farmers. Number of networks in each category given in parentheses.

Categories			
Farmer vs. agency	Network size	Active	Dairy
		%	
Farmer (11)	5–10 (7)	<10% (3)	50–60% (7)
Extension (9)	11–15 (4)	11–50% (8)	61–89% (7)
LCD† (3)	16–30 (6)	51–75% (7)	90–96% (7)
NRCS‡ (0)	31–50 (4)	75–90% (3)	100% (2)
	100–200 (2)	100% (2)	

† Land Conservation Department, Wisconsin Dep. of Agriculture, Trade, and Consumer Protection.
‡ Natural Resources Conservation Service.

tendance at events, and publicity efforts. Under challenges, concerns, and accomplishments, we asked coordinators to comment on meeting the needs of beginning as well as advanced graziers, list other issues that are currently important or may emerge in the future, affect network activity, and highlight some achievements of their network.

Numerical responses were recorded in a spreadsheet. Other responses were coded (e.g., for stock classes, dairy was coded as 1, beef cow–calf as 2, beef stocker as 3, etc.) and added to the spreadsheet. The spreadsheet was used to develop summary statistics and to sort the networks into several groupings. Sorting enabled an evaluation of the relationship between certain network attributes and the networks' structure and function. The attributes used for the groupings included: (i) farmer vs. agency coordination, (ii) network size (number of active members), (iii) percentage of the total number of members who are active participants, and (iv) proportion of active members that are dairy farmers.

For each of the attributes, the networks tended to group themselves into clusters that we placed in either four or five *naturally occurring* categories (Table 1). Using network size (number of active members) as an example, six networks had between 5 and 10 members, four networks had 11 to 15 members, seven networks had between 16 and 30 members, four networks had between 31 and 50 members, and two networks had between 100 and 200 members, for a total of five categories. Question responses were averaged for each category and compared among categories.

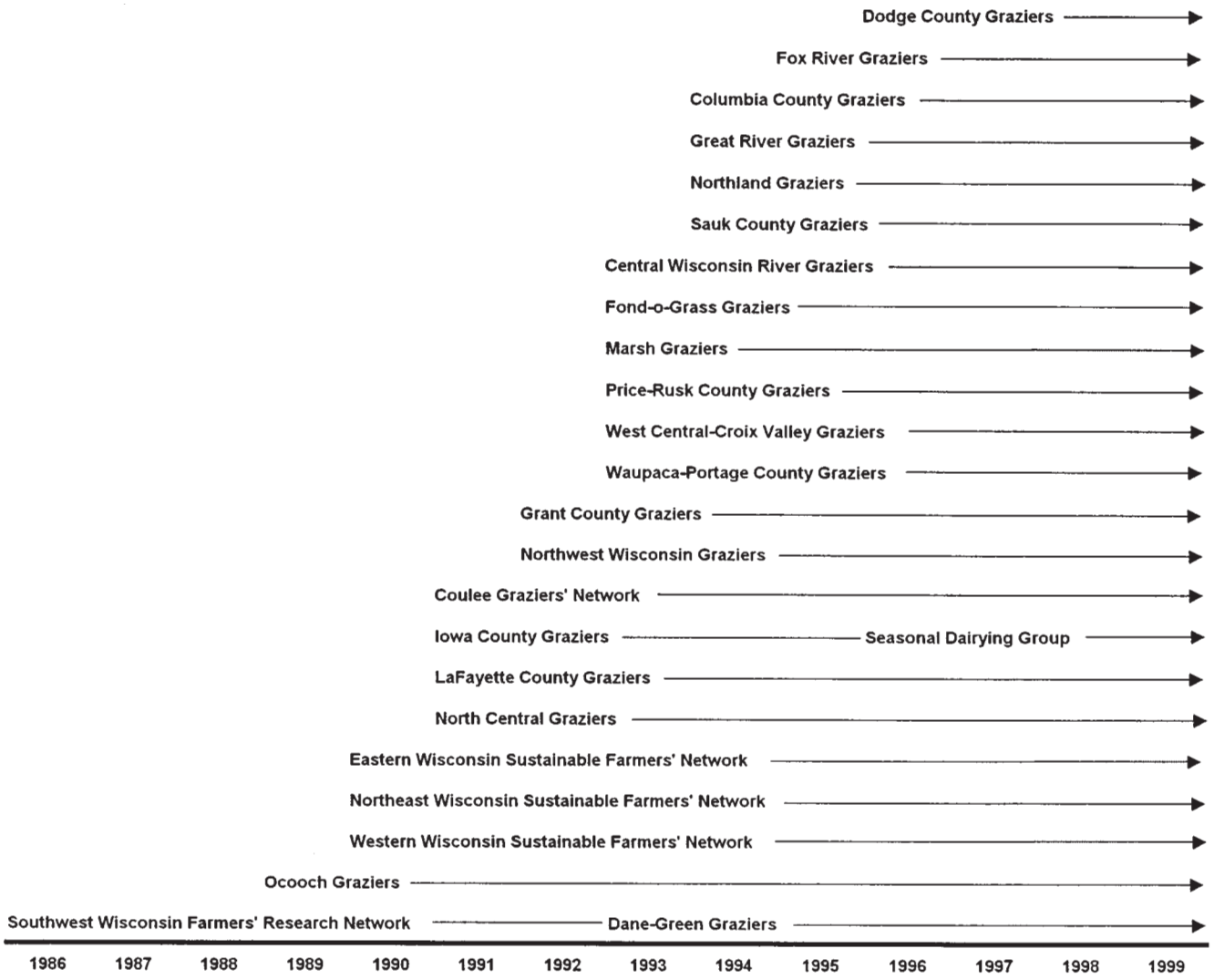

Fig. 1. Time line of Wisconsin grazing network establishment.

RESULTS AND DISCUSSION

History of Wisconsin Grazing Networks

Wisconsin's networks had their beginnings in 1986. After attending a conference sponsored by the Rodale Institute (Rodale, 1985), four farmers initiated an on-farm research network (Hassanein, 1997). With financial support from the Wisconsin Rural Development Center, the Southwest Wisconsin Farmers' Research Network (SWFRN) became the state's first farmer network. The group's goals were to (i) develop practical and reliable methods of evaluating technologies; (ii) encourage information exchange among farmers; and (iii) build relationships with University of Wisconsin-Extension and research personnel (C. Fredericks, 1993, personal communication).

The number of networks grew rapidly in the following decade with support from the Wisconsin Department of Agriculture, Trade, and Consumer Protection's Sustainable Agriculture Program, which funded networks in several of the seven funding cycles between 1988 and 1996 (Nelson, 1996). By 1996, all 23 networks had been established (Fig. 1).

In 1993, several members of SWFRN formed a statewide nonprofit organization, GrassWorks, Inc., whose primary focus is to sponsor an annual 2- to 3-d grazing conference. GrassWorks, Inc. is guided by a rotating board of farmer directors and a part-time coordinator, with occasional input from agency personnel. Until recently, its activities were financed entirely through receipts from the grazing conference, which regularly attracts 500 or more participants from the Upper Midwest. In 1999, GrassWorks was chosen by the Natural Resource Conservation Service (NRCS) to administer more than $100 000 in Grazing Lands Conservation Initiative (GLCI) funds earmarked for grazing network enhancement in Wisconsin. The funding has strengthened the relationship among GrassWorks, the networks, and the NRCS and has moved the networks toward more regional and statewide organization. In the years since SWFRN was founded, GrassWorks and the 23 local grazing networks have made progress toward the original goals set out by SWFRN.

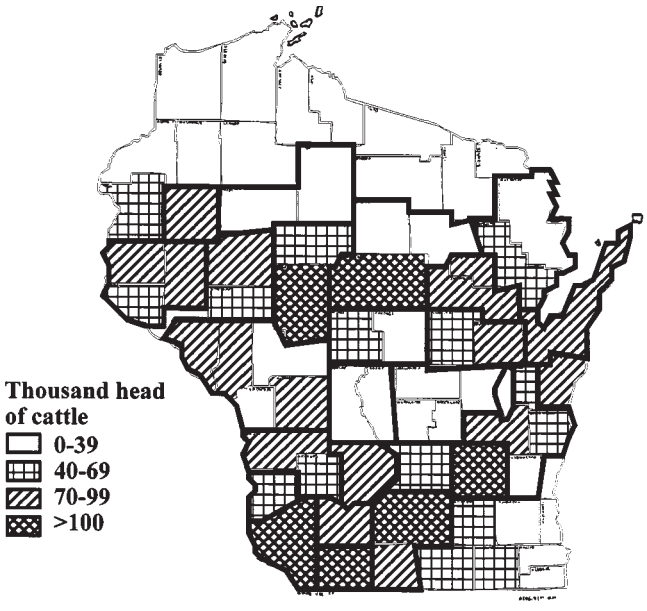

Fig. 2. Coverage of major cattle production regions in Wisconsin by grazing networks. Network boundaries are indicated by bold outlines. Cattle numbers in thousands of head indicated by hatching.

Network Composition and Size

Figure 1 illustrates the status of grazing networks as of late 1998, as well as the gradual spread of the concept among livestock farmers in Wisconsin. The average network age is 5.4 yr, but the groups are at different stages of development.

Grazing networks exist in most major livestock producing regions of the state (Fig. 2), occurring in 51 of the state's 72 counties. Each network covers an average of 2.5 counties (range 1–5 counties). Early activity occurred in southwestern Wisconsin, but the greatest current network activity is in central Wisconsin, including one group that has received a large grant. With a full-time, paid coordinator, this network has a mailing list of 600 farmers in three counties.

Dairy farmers comprise the largest proportion of grazing network membership, averaging 79.5% with a range of 50 to 100% (Table 2). Other livestock classes represented in Wisconsin grazing networks include cow–calf operations (11%), stocker beef operations (4.6%), sheep producers (2.5%) and others (2.6%) including bison (*Bison bison*), chickens (*Gallus gallus*), hogs (*Sus scrofa*), emu (*Dromaius navaehollandiae*), and llamas (*Lama glama*).

Aside from the Central Wisconsin group with 600 participants, the largest grazing network in the state has a mailing list of 200 participants. The smallest has 10 members. Overall, average membership is 84 individuals or couples, but would be 59 individuals or couples without the large central Wisconsin group.

Survey respondents were asked to estimate the proportion of *active* members in their group. The proportion of active to total members ranged from 7 to 100%, and averaged 48%. The two networks reporting the lowest proportions of active members (<10%) had relatively large mailing lists of 110 (7% active) and 200 (10% active), respectively (Table 3). In contrast to the <10% active groups, groups reporting 75 to 100% active membership averaged only 25 total members on their mailing lists. Several factors may be involved in these differences, with mailing list management possibly playing a role.

Table 2. Summary statistics for the 23 networks grouped by percentage of network members who are dairy farmers.

% of Members	50–60	61–89	90–96	100	Avg†
No. of networks	6	8	7	2	--
No. on mailing list	88	46	138	111	84
No. of active members	19	18	62	51	32
	% of membership within network				
Dairy producers	53.3	82.6	93.1	100	79.5
Cow–calf	25	9.1	3.6	0	10.9
Stocker beef	12.5	2.7	0.9	0	4.6
Sheep	3.3	3.3	1.7	0	2.5
Other livestock	5.8	2.3	0.7	0	2.6
Assistance received	% of networks				
Extension	33.3	57.1	57.1	100	50
LCD	33.3	0	28.6	22.2	18.2
NRCS	33.3	0	14.3	0	13.6

† Averages are calculated from the 23 individual network responses, not from the grouped responses in this table. Averaging across the rows, without weighting by the number of networks in each group, will result in a different mean.

Table 3. Summary statistics for the 23 networks grouped by percentage of active members.

% of Members	5–10	11–50	51–75	76–90	91–100	Avg†
No. of networks	3	8	7	3	2	--
No. of counties/network	1	2.4	2.7	1.7	4.5	2.5
No. years in existence	7	4.9	5.3	5.7	6	5.4
No. on mailing list	155	129	54	24	28	84
Dairy producers, %	50	80	76	96	97	79.5
Advertising used			% of networks			
Individual mailings	0	87.5	85.7	66.7	100	77.3
Newspaper	50	75	57.1	33.3	50	59.1
Radio	0	25	14.3	66.7	0	22.7

† Averages are calculated from the 23 individual network responses, not from the grouped responses in this table. Averaging across the rows, without weighting by the number of networks in each group, will result in a different mean.

Coordinators differ in the frequency with which they purge their mailing list of inactive members and in their inclination to include people who are not expected to be active participants such as members of the media or agency personnel. Another factor that may play a role in member activity is that network structure lends itself to small group activities. Farmers tend to learn from each other in small group or one-on-one settings (Barrett and Ewert, 1998; Hassanein, 1997). As groups get larger and more diverse, it may be more difficult to meet the needs of everyone. Maintaining a high interest level may become more challenging. Among the 23 networks, the number of actively participating members averaged 32, with 17 networks reporting active member numbers under 30, four groups reporting active memberships between 30 and 50, and two groups with active memberships of more than 100 (Fig. 3).

Network Coordination and Agency Support

Like much of the technology used in MIG, grazing networks originated in New Zealand more than 40 yr ago (Barrett and Ewert, 1998). The New Zealand model involves a fairly structured approach with a *Consulting Officer* and a *Farmer Convener*, whereas most Wisconsin grazing networks operate on a more casual basis, some actively resisting formal structure.

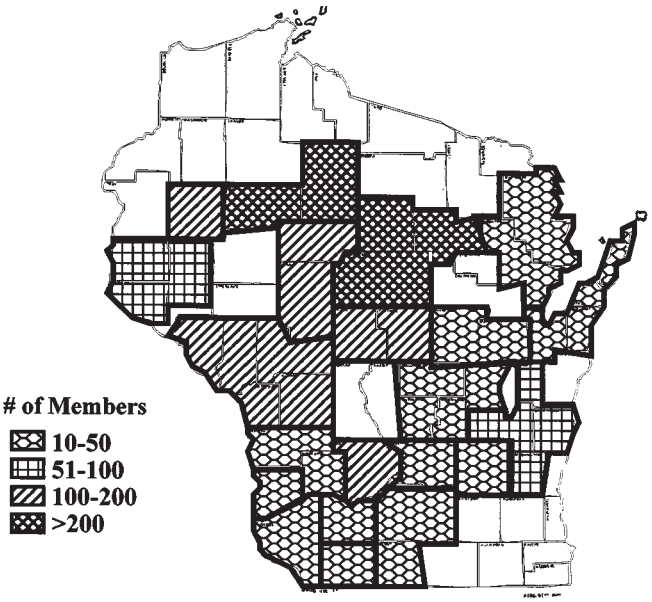

Fig. 3. Wisconsin grazing networks categorized by number of active members. Active members were identified as those who regularly participate in activities and/or play an active role in organizing and conducting activities.

Table 4. Percentage of networks receiving support for their activities. Types of support provided by agencies including the University of Wisconsin Cooperative Extension Service, county land conservation departments (LCD) and the USDA Natural Resources Conservation Service (NRCS), and by private sources including farmer members, nonprofit organizations, and commercial agriculture suppliers.

Type of support	Extension	LCD	NRCS	Private
			%	
Financial	0	14	14	23
Office space	23	18	9	5
Equipment	23	9	0	9
Coordinator's time	50	18	5	9
Postage and copying	50	14	9	9
Other	9	0	0	10

All Wisconsin grazing networks were initiated by farmers. In many cases, farmers approached local Cooperative Extension Service or Land Conservation Department personnel for assistance in organizing a network. Most groups have a single designated coordinator, although three networks have two or more people from different agencies cooperating to provide coordination. Two are coordinated by a farm couple. Two groups have structured themselves with a *contact person* rather than a coordinator, reflecting a stated decision to stress their informality and democratic makeup.

Currently 11 of the 23 grazing networks are coordinated by farmers and 12 by agency personnel. The University of Wisconsin Extension Service provides the majority of agency coordination (nine networks). County-based land conservation departments (LCD) provide three coordinators.

Whether coordinated by a farmer or agency personnel, nearly all groups receive support from agencies in one or more of the following forms: postage and copying, equipment, office space, monetary support, and coordinator's time, with postage and copying, and coordinator time the two primary forms. Cooperative Extension Service provides these items to more than 50% of the networks (Table 4). Cooperative Extension also provides other in-kind support, but does not provide financial support to any network. Local LCD and NRCS offices tend to provide lesser amounts of in-kind support, but more financial support. Other sources of support listed by respondents include individual member contributions, a local farm supply cooperative, the Wisconsin Forage Council, and grants from either state or federal granting agencies. The large Central Wisconsin network has put together a group of funding sources including the USDA Sustainable Agriculture Research and Education program (SARE), the U.S. Fish and Wildlife Service, as well as conservation organizations such as Pheasants Forever and the Wisconsin Waterfowl Association.

Agency support seems to be an important factor in sustaining network activity. Although conversion to grass farming generally results in a reduction in number of hours worked (Jackson-Smith et al., 1996), few farmers seem able to invest significant amounts of time in leading grazing networks. Many farmers may be too busy to find the time and energy to put toward organizing activities for their grazing group or may not have the necessary skills or interest.

Table 5. Summary statistics for the 23 networks grouped by number of active members.

No. of members	5–10	11–15	16–30	31–50	100–200	Avg.†
No. of networks	7	4	6	4	2	--
No. on mailing list	30	44	73	50	386	84
No. years in existence	4	6	5.5	6.5	6	5.4
Active members, %	52	40	40	70	47	49.6
Dairy producers, %	73	86	74	84	93	79.5
Assistance received	% of networks					
Extension	17	100	33	75	100	50
LCD	33	0	17	25	50	18.2
NRCS	17	0	0	25	50	13.6

† Averages are calculated from the 23 individual network responses, not from the grouped responses in this table. Averaging across the rows, without weighting by the number of networks in each group, will result in a different mean.

Table 6. Summary statistics for the 23 networks, grouped by farmer vs. agency coordination.

	Farmer coordinator	Agency coordinator
No. of networks	11	12
No. on mailing list	34	111
No. active members	19	42
Active members, %	55.9	37.8
Dairy producers, %	75.9	82.6
Other livestock, %	4.6	0.8

The seven smallest networks received less support from extension than the largest groups (Table 5). Three of the smallest networks received no agency assistance, two received support from LCDs and one from NRCS. Only one of the smallest groups received support in the form of coordinator time and postage costs.

Of the three networks that exist without any agency support, two have approached local agencies but have been unsuccessful at engaging agency personnel in their activities. The third group recently lost agency support with the expiration of a grant and has instituted collection of dues to cover costs.

Farmer vs. Agency Coordination. We found few major differences in structure, composition, or activities between the 11 farmer-coordinated and 12 agency-coordinated networks (Table 6). Although the majority of farmer-coordinated networks received support from the Cooperative Extension Service in the form of postage and copying and equipment, farmers provided the leadership and coordination of activities in these groups. Farmer- and agency-led groups had similar proportions of dairy and beef producers, but farmer-led networks tended to have higher proportions of other livestock producers than agency-led networks (4.6 vs. 0.8%, respectively).

Groups coordinated by farmers tended to be smaller with an average of 19 active members vs. 42 for agency-coordinated groups, although without the 200 active-member group, agency-coordinated groups averaged 27 active members. All groups engaged in similar activities, although farmer coordinators reported lower attendance for pasture walks, conferences, and other activities.

Network Programming and Activities

Pasture Walks

A pasture walk involves walking in a pasture, but beyond that basic premise a number of views exist on the definition and role of the pasture walk. In the words of one grazier: "A Pasture Walk is a simple procedure to walk the land (anyone's pasture) and let the land tell you what's going on. A Pasture Walk is based upon good observations of nature's laws—ecological principles…" Others view the pasture walk as a communication tool: " Pasture Walks involve other graziers. They serve as constructive critics, extra sets of observing eyes, fellow commiserators, question-raisers, and most importantly these people are genuinely interested—dedicated to making grazing work even better on everyones' farms…. There is a difference between walking your pasture and a pasture walk." (D. Gneiser, 1998, personal communication).

All Wisconsin grazing networks conduct pasture walks. Most occur once a month during the grazing season between April and October and are hosted on a different farm each month. The most common format is a 2-h activity beginning in early afternoon. Attendance estimates for individual pasture walks ranged from 2 to 75 participants; network averages varied between 12 and 26 people.

Starting with an introduction to the farm by the host, the group proceeds to the pasture to evaluate species composition, grazing management, fencing layout, watering, lanes, specific problems facing the host grazier, or other topics. In most cases, no effort is made to guide or focus the discussion. At times, the entire group may be involved in a single conversation; at others, subgroups may form to discuss side topics. Following the walk, the group returns to the farmstead for refreshments provided by the host.

Variations on this format include pasture walks with a specific theme such as visiting a new milking parlor or helping a new grazier lay out paddocks, or having an invited speaker talk about a specific topic, such as a veterinarian speaking on parasite control on pasture. Twenty-two percent of the groups reported having special topics or invited speakers at their pasture walks. Some groups have begun offering a Saturday pasture walk in response to the increasing number of farmers who have off-farm weekday jobs and are not available during the week.

The Grass Series

Twenty three percent of the networks have instituted a variation of the pasture walk designed for more advanced graziers: the *grass series*. For the grass series, a farmer agrees to host several pasture walks throughout the grazing season within a single year. In that way, participants are able to see more than just a snapshot of the farm, they are allowed to follow its progress through the grazing season and learn how the host farmer deals with changes over time. It allows for more in-depth discussion and understanding of how these complex systems function. It also allows for perhaps a closer, more intimate sharing of information among participants. Attendance at these grass series pasture walks averages 27 people.

Other Activities

Twenty six percent of the networks conduct an annual all-day, off-season conference, usually in late fall or early spring. Attended by 38 to 81 people, these conferences involve a mixture of expert presenters and farmer panels on a range of topics. The atmosphere is informal, enhancing opportunities for

discussion. Financial support for these conferences is sometimes obtained from granting agencies such as the NRCS GLCI and the USDA SARE program. This additional support has allowed the groups to invite outside speakers from other states, pay honoraria, and to reduce the cost of registration to a nominal level.

More than half the groups (64%) organize their grazing season activities during one or more meetings during the winter months. These planning meetings also serve as social events, often with a potluck meal, and are attended by 19 to 24 people. Several of the larger groups have designated informal committees that take on the planning role, which keeps the attendance of these meetings down to a workable number. The group decides who will host pasture walks and the topics and projects for the next season.

Challenges and Concerns

Respondents were asked about challenges or concerns facing their networks. Nearly 75% of the groups voiced specific challenges or concerns. Twenty six percent of the networks cited issues related to grazing management as their primary concerns. These included helping smooth the initial learning phase for beginning graziers, learning more about Voisin grazing methods (Voisin, 1988), developing higher quality pastures to boost milk production, making their farms work better as an integrated system, and encouraging the university to do more grazing research to provide answers to production questions. Others included issues dealing with network functioning such as lack of leadership (13%) and lack of financial or agency in-kind support (22%).

Fostering Active Participation

All network coordinators expressed concern about maintaining active participation among members. High levels of active membership may reflect a combination of factors such as member enthusiasm and commitment, quality of programming, and efficiency of communication within the network, as well as network longevity and composition.

Communication. Many of the more active networks used more than one method to communicate with members. All of the larger groups relied on regular individual mailings to inform members of activities compared to none of the smaller groups (Table 3). Fifty-nine percent of the groups also used local or regional newspaper or magazine advertising. Several statewide agriculture newspapers publish a pasture walk calendar at no charge to networks. Nearly 25% of the networks advertised their events in specialty newsletters such as those published by the Dairy Herd Improvement Association, local cooperatives, or other industry newsletters. Twenty-three percent advertised on the radio, and two groups published their own newsletter.

New Member Recruitment. While network coordinators strive to maintain member participation, recruiting new members was listed as an important concern by less than half of networks. Groups with less than 10% and more than 75% active membership reported doing nothing to attract new members. Of the networks with between 10 and 75% active membership, two-thirds reported actively soliciting new members. These networks planned their advertising with the goal of bringing in new participants. Seventeen percent of the groups made an effort to attract new members via word of mouth or sending announcements of pasture walks to members' neighbors.

Other Factors. Regardless of group size, all network coordinators reported similar types of activities, interests, and other concerns. However, we found that the networks with the fewest active members (5–10) have been in existence an average of 4 yr, whereas the largest groups with 100 to 200 active members averaged 6.3 yr in existence (Table 5). Maturing networks tended to be more organized and better able to attract and retain participants without significantly altering network activities. The groups with the highest participation rates also had the highest proportion of dairy farmers among their members (95%), with the number of active members decreasing with decreasing percentages of dairy farmers (Table 2).

Advanced vs. Beginning Graziers

One issue that came to light was addressing the needs of advanced vs. beginning graziers. More than 60% of the networks face this issue, particularly the more established networks where many graziers have been managing pastures for 5 to 10 yr. The issues facing these experienced graziers are very different from those of beginning grass farmers. Some networks are struggling to balance the needs of these two groups. Because of the farmer-to-farmer nature of the network learning process, it is vital to retain experienced graziers to make their knowledge available to beginners. For the process to work, however, all members must see value in participating and feel that they have something to gain as well as to give through their participation.

The networks have dealt with this challenge in a number of ways. Several networks closed their membership and referred beginners to other groups or sources of information. These closed, advanced groups are able to focus on specific issues, such as seasonal dairying, or to develop a level of trust that allows investigation of issues that are of a more private nature, such as farm finances and profitability.

Other approaches to this challenge included having special topics or speakers at pasture walks (22% of the networks), working on special projects such as economics or pasture forage sampling (50%), hosting grass series for advanced graziers (23%), and mentoring for beginners (22%). Mentoring takes the form of pairing a beginning and advanced member or inviting beginning members to host a pasture walk to receive advice from experienced members on his or her farm.

Network Achievements

The final question of the survey was an open-ended one: What are some of your group's accomplishments? In response, agency coordinators tended to stress the quality of the learning experience provided by the network and such things as hosting an annual conference. One network has developed a curriculum for use by high school agriculture teachers.

Farmer–coordinators stressed family and social issues more than agency coordinators. A common theme from several farmer–coordinators involved the development of closer ties among members, resulting in a greater ability to share

everything from financial concerns to family needs to purchased equipment. Representative activities included family picnics, golf outings, field trips to other networks, cooperative purchase of equipment among network members, and group work days in which participants assisted one member in accomplishing a major project such as building a milking parlor. Several farmer coordinators felt that their greatest accomplishment was simply starting their network and having it remain an active and independent organization meeting the needs of its members.

CONCLUSIONS

By examining the history, structure, and function of Wisconsin's grazing networks, this research has pinpointed several factors that influence the effectiveness of grazing networks as a vehicle for information transfer. Survey data, combined with our observations as participants in network activities during the past 7 yr, provide us with the following conclusions:

1. The importance of pasture walks. The primary vehicle for information exchange is the pasture walk. While attendance at individual pasture walks can be 75 people or more, this is an activity that is most effective for small groups. Pasture walk themes such as the grass series can enhance the learning experience and help advanced as well as beginning graziers progress. Off-season activities can provide continuity from one grazing season to the next.

2. Agency support. We found few major differences in structure, composition, or activities between the 11 farmer coordinated and 12 agency coordinated networks. However, agency support seems to be an important factor in sustaining network activity. Whether coordinated by a farmer or agency personnel, nearly all groups received some support from agencies.

3. Communication was a factor in network size and member activity. The single factor that seemed to have the greatest impact on pasture walk attendance was the monthly pasture walk reminder. Direct mailing appears to be one of the most effective ways to keep members active. Agency support becomes important here, since mailings are expensive in terms of both money and time. Those networks having agency assistance with this expense were better able to keep their membership informed of their activities and tended to be larger groups with higher proportions of active members.

4. Homogeneity. One factor that appears to affect the proportion of active membership is homogeneity of member interests. All grazing networks had a relatively high proportion of dairy farmers, ranging from 50 to 100%, but percent active membership increased as the percentage of dairy farmers increased. Four of the five networks sponsoring grass series were in the highest category of dairy membership. This category had the highest level of cooperative extension coordination (Table 2).

5. Needs of advanced vs. beginning graziers. High proportions of dairy producers and high levels of cooperative extension support have helped some networks deal with another major issue: meeting the needs of advanced vs. beginning graziers. The cohesiveness of these networks has allowed members to maintain similar skill levels and extension coordinators tend to have the educational skills to provide advanced learning situations such as grass series or discussion groups. Advanced networks with closed memberships have been able to focus on specific issues, such as seasonal dairying, or to develop a level of trust that allows investigation of issues that are of a more private nature, such as farm finances.

6. Commitment to the network. A common theme voiced by several networks was the importance of developing close ties among members. Although we asked no specific questions on the subject of commitment, it was mentioned in responses of 10 of the 23 coordinators. An example of a network that has developed in this direction is the Green Hills Project in northwestern Missouri. With a membership of more than 100 families, including a wide range of livestock producers, this network has been in existence for more than 10 yr. In this network, members share a stated set of values including a positive outlook on farming, a belief in consensus, and a common respect and trust, which may contribute to their cohesiveness (Rikoon et al., 1997). Our survey suggests an evolution in this direction and an emphasis on farmer-driven priorities for many Wisconsin networks. Fostering these values may help networks overcome some of the challenges of meeting the needs of a varied clientele.

7. Increased interaction among networks, university, and agency personnel. Wisconsin grazing networks have provided an apparently effective vehicle for transfer of local knowledge from farmer to farmer. They have been at the heart of the growth of MIG among livestock farmers from <5% in the early 1980s to more than 20% today (D. Jackson-Smith, 1999, personal communication). Reflecting back to the original goals of the SWFRN can provide insights into how grazing networks have played this role. Two of SWFRN's goals are just beginning to be realized: (i) development of practical and reliable methods of evaluating technologies, and (ii) building relationships with University of Wisconsin-Extension and research personnel. Grazing networks have provided a link through which researchers have connected with individual farmers to develop on-farm research projects. These links have helped create relationships with University of Wisconsin researchers as well as private seed companies and have allowed graziers to participate in or learn from on-farm trials evaluating grass variety performance and seeding methods, for example. Other cooperative efforts between graziers and researchers have been in the area of farm financial performance (Kriegl, 1999). Recently, with funding from the NRCS GLCI, university and agency personnel have begun a series of training workshops employing graziers as teachers. Graziers now sit on a GLCI board of directors that coordinates network activity throughout the state.

The third objective of the SWFRN was to encourage information exchange among farmers. Grazing networks exist in most major livestock producing regions of the state with a total membership of 698 active participants, and another 1846 on mailing lists. This is a relatively small number compared with some 20 000 dairy farmers in the state (Battaglia et al., 1999), and without network activity, these grass farmers would have no medium through which to meet.

Agencies can support the efforts of networks by providing local support in the form of postage, copying, and other facilities, enhancing the educational experience by guiding discussions, providing access to research results, sponsoring

demonstrations, and encouraging and fostering leadership among network members.

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REFERENCES

Barham, B.L., F.H. Buttel, J. McNichol, D.B. Jackson-Smith, and S.D. Wood. 1995. Expansion trends in Wisconsin dairying: Evidence from the 1994 ATFFI dairy farmer poll. ATFFI Res. Pap. 12. Univ. of Wisconsin Coop. Ext., Madison, WI.

Barrett, K., and D.M. Ewert. 1998. Farmer to farmer learning groups. Cornell Univ. Coop. Ext., Ithaca, NY.

Battaglia, R.J., R. Tauchen, and W. Thompson. 1999. Wisconsin agricultural statistics. Wisconsin Dep. of Agriculture, Trade, and Consumer Protection, Madison, WI.

Hassanein, N.E. 1997. Exchanging knowledge, building community: Farmer networks and the sustainable agriculture movement. Ph.D. diss. Univ. of Wisconsin, Madison, WI.

Jackson-Smith, D. 1996. Wisconsin agriculture in historical perspective: economic and social changes, 1959–1995. ATFFI Tech. Rep. 4. Univ. of Wisconsin Coop. Ext., Madison, WI.

Jackson-Smith, D., B. Barham, M. Nevius, and R. Klemme. 1996. Grazing in dairyland: The use and performance of management intensive rotational grazing among Wisconsin dairy farms. Tech. Rep. 5. Univ. of Wisconsin Coop. Ext., Madison, WI.

Kriegl, T. 1999. Wisconsin dairy grazing profitability analysis [Online]. Available at http://www.wisc.edu/dairy-profit/pubs.html#papers (posted 28 July 1999; verified 1 Nov. 1999).

Nelson, C. 1996. Seeds of change: The Wisconsin Sustainable Agriculture Program. ARM PUB 65. Wisconsin Dep. of Agriculture, Trade, and Consumer Protection, Madison, WI.

Rikoon, J.S., W. Heffernan, J. Gilles, and R. Albee. 1997. New farmer network groups and the university: A case study of Missouri's Green Hills Farm Project. Missouri Agric. Exp. Stn., Columbia, MO.

Rittmann, S. 1994. Exploring minds on changing farms: A case study of a grass farmer network in southwestern Wisconsin. M.S. thesis. Univ. of Wisconsin, Madison, WI.

Rodale, R. 1985. Past and future of regenerative agriculture. p. 312–317. *In* T.C. Edens et al. (ed.) Sustainable agriculture and integrated farming systems: 1984 conference proceedings. Mich. State Univ. Press, East Lansing, MI.

Suppe, F. 1987. The limited applicability of agricultural research. Agric. Human Values 5(4):4–14.

Undersander, D.J., B. Albert, P. Porter, and A. Crossley. 1993. Pastures for profit: A hands on guide to rotational grazing. Publ. A3529. Univ. of Wisconsin Coop. Ext., Madison, WI.

Voisin, A. 1988. Grass productivity. Island Press, Washington, DC.