



Farming without a recipe: Wisconsin graziers and new directions for agricultural science

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A B S T R A C T

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From 2005 through 2008, we undertook a participatory research project involving graziers from 8 farms in Southern Wisconsin, all of whom practice management intensive grazing. We used semi-structured interviews and participant observation during research and field days to investigate graziers' engagement with university research. Grazing farms demonstrate rich variability and individuality as a result of their position within a number of biophysical and social contexts. Graziers emphasized the importance of finding ways to work with the variables of their specific context, rather than trying to control that variability. This effort entails the development and use of local knowledge, as graziers respond to the idiosyncrasies of their farms. It also leads graziers to reject mainstream agricultural research that has produced formulas for agricultural uniformity. The picture of grazing that emerged from our interviews leads us to propose the search for *agroecological principles* and *agroecological tools*, embedded in context, as an alternative to conventional research. We argue that this proposal speaks to the greater conundrum of how to relate the general knowledge of science to the place-specific, experience-based knowledge of grass-based farmers.

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1. Introduction

Kurt and Renee have nothing against corn. They even grow some to feed their dairy cows in the winter. Their cows have eaten mainly grass since the farm became a grazing operation, but Kurt and Renee don't think they'll ever stop growing a few annual crops. It's good insurance, they say, for years like this one when they would be paying record-breaking prices to buy supplementary feed. So when Kurt says he can't stand Roundup Ready crops—corn, soybeans, and other plants genetically modified to pair with a neat package of herbicides—it's not the corn or the beans, specifically, that bother him. It's the mentality that he believes accompanies such farming methods.

"Since Roundup Ready crops," he says, "all you gotta do is follow a recipe card and you would never have to look at the crop. You can write it all down on paper and as long as you pay somebody to do X, Y, and Z, it'll basically work."

From across the gravel driveway, a cow bellows emphatically. The herd has been turned into a paddock near the barn, in grass up to their knees.

"For me," Kurt goes on, "a big factor in animal success is personal attention. And that takes a lot of time. But I think we're all pretty committed. My fifteen-year-old has gotten pretty good at assessing animal condition and knowing when something's right, when something's wrong. That's the reason I'm not interested in huge numbers of cows. Because I need to be able to take care of each on an individual basis. I think that's the best for them."

Kurt and Renee operate a small dairy farm in Southern Wisconsin, and like the seven other farm families in this study, they practice management intensive grazing. Much of their land is in permanent pasture, divided into a number of paddocks through which they rotate about 120 head of cattle. This paddock system compels the livestock to graze more evenly, and gives plants a resting period between grazing events, which seems to result in greater pasture productivity (Jackson et al., 2007; Paine et al., 1999). The frequency of the rotation and the size of the paddocks depend on a number of variables (such as how fast the grass is growing) which graziers continually observe and judge. In doing so, graziers come to understand their pastures in the same way that Kurt's son has learned to judge a cow's health—through experience. They also, out of practicality, learn to respond to variations, from the climatic conditions of a particular year to differences in soil type, that make one area of the farm drier than another.

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Over the course of three years, we worked with 8 Southern Wisconsin grazing farms, conducting experiments on their land while engaging with them through interviews and field days about the role of university research in the grazing movement. A recurring theme in these conversations was that there is no single best way to graze. The best way for any particular farm, these graziers emphasized, depends on a wealth of variables extending from biophysical conditions to a farmer's personal values. This requires graziers to learn the best way to farm largely through personal experimentation and observation, through the experience of neighbors and peers, and through careful reflection on their own goals. Departing from what Kurt called the "recipe card" method of conventional agriculture, graziers strive to "look at the crop," in the broadest sense.

In an earlier brief commentary piece (Bell et al., 2008), we sketched out how this attention to a farm's unique contexts contributes to both the productivity and sustainability of alternative agricultures such as grazing. We made a case that research can support such approaches to farming by providing *agroecological principles* rather than formulas for production—in other words, by providing a generalized understanding of agroecological processes and the contexts in which they operate. In this paper, we provide the data on which that commentary was based, and further our argument by discussing some of the tensions researchers and farmers face as they try to pursue such an approach to knowledge. One of those tensions is the practical need for routines of action in the face of the complexity and time demands of farming. Here we add the argument that researchers can also offer routines of action which we call *agroecological tools*, following the lead of one of the respondents. As we will describe, developing flexible agroecological tools can allow farmers to apply agroecological principles without resorting to a recipe approach.

Another tension is that researchers find it difficult to develop agroecological principles in the face of the contextual variability of the world. Here we suggest, also following the lead of a respondent, the value of *case knowledge* in the development of principles that help farmers understand the variability of their contexts, rather than attempt to reject it. We also argue that embedding agroecological knowledge in case studies keeps both tools and principles from becoming recipes, and thus helps them remain relevant to the ever-varying contexts of all farming.

In the last several decades, management intensive grazing has become increasingly important in Wisconsin, where the number of grazing dairy farms increased throughout the 1990's even as the total number of dairy farms fell (Taylor and Foltz, 2006). In the absence of comprehensive university research programs directed at management intensive grazing, and without the kind of private sector research which agribusiness might provide for more conventional farming systems, the grazing movement has relied largely on knowledge produced by graziers, for graziers. This has included knowledge from graziers' own experimentation (e.g. Reuchel, 2006; Logsdon, 2004; Salatin, 1995), knowledge developed and shared through grazing networks (Hassanein, 1999), and graziers' own interpretations of literature revived from an era when grazing was commonplace (e.g. Voisin, 1959; Murphy, 1987). Now, partly as a result of successful advocacy, more funding is available for research about alternative agricultures, and grazing has attracted the interest of researchers in a number of disciplines. As researchers, then, we are at a moment to critically review the role that science has played in producing knowledge about agriculture, and to ask what new role university research might play as we engage with the grazing community.

To begin this task we will first lay out the ways in which graziers work with the many sources of variation on their farms. We will argue that working *with* variation, (rather than *against* it) entails

the use of local knowledge and defies the kind of formulaic management practices offered by mainstream agricultural science. Secondly, we will ask how university research can best contribute to knowledge about grazing, given the disconnect between mainstream science's search for general knowledge which is independent of context and graziers' need for knowledge specific to individual places. While we do not pretend to offer a full resolution to this disconnect, we argue that agroecological tools and principles provide forms of general knowledge that can bring farmers and researchers together in a richer appreciation of context and that can enhance agriculture's ability to farm with variability.

2. Methods

From 2005 through 2008, we undertook a participatory research project involving graziers from eight farms in Southern Wisconsin, all of whom practice management intensive grazing. In doing so, these farmers diverge sharply from the conventional model of livestock farming in the United States, which is to keep animals in confinement for much of their lives, and feed them largely on silage produced from annual row crops such as corn, soybeans, and alfalfa. The reasons for practicing grazing instead of the confinement method involve economic, environmental, and social considerations, as we shall see. The farms in our study included beef, sheep, and dairy operations in four counties in Southern Wisconsin, and ranged in size from 30 to 250 head of animals, and from 80 to about 350 acres. Some farmers were recruited through existing research relationships with the university, while others volunteered for the project after a presentation at a conference put on by an organization that promotes grazing in Wisconsin. For practical purposes, participants were limited to farms within feasible driving distance of Madison, the site of our home institution, the University of Wisconsin—Madison, which lies in south-central Wisconsin.

We, the researchers, are an interdisciplinary research team of faculty and graduate students brought together as part of the Agroecology Cluster at Madison, and we were interested in examining questions about pasture ecology while also developing a participatory approach to research. We went about testing our natural science questions by collecting data from on-farm plots as well as plots on a university-owned research farm. As we did so, we engaged with farmers informally when we visited their farms, and held two field days where we discussed the progress of the project, the experimental design, results as they became available, and possible interpretations of those results. The field days also gave us a chance to talk about the broader role of university research in the grazing community.

In addition to field days and informal discussions, we conducted a series of interviews with the farmers and researchers throughout the course of the project. These interviews were semi-structured, using an interview guide but following up on unplanned topics that arose through conversation. Some of our questions were about farmers' and scientists' motives for working with each other and their constraints to doing so—which produced findings we have discussed elsewhere (Lyon et al., 2010). Other questions, which we address here, were about graziers' specific management practices, how they made decisions, and what kind of research they sought from the university. After identifying themes in a first round of interviews, we followed up on those themes in a second round, taking an iterative approach to our analysis.

3. Recurring themes in graziers' approach to farming

Graziers' accounts of the way they farm show how the productivity, resilience, and pleasure of management intensive grazing come from working with the variability of the land, a process which

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