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Abstract

In this article, the authors examine the ideological tensions of organic and chemical farmers in the High Plains. They show that the identity of these farmers is created and maintained through competing systems of tillage and the ideologies that support them, which also shape the agricultural landscape. Specifically, they compare conservation tillage wedded to 'modern' ideologies of scientific farming with conventional tillage newly linked to beliefs about both organic and traditional farming, and examine how farmers use these different forms of tillage to create their identities. Roadside farming, recognition and denunciation of other farmers' practices, and recognition and justification of their own contribute to identity formation. This research contributes to the ongoing discussion of how identity is formed through day-to-day activities in the material world. The plow creates divisions in the High Plains community between organic farmers who continue to rely on this implement in their material engagement with the land and the chemical farmers who distance their practices from the plow as they distinguish themselves as stewards of the soil.

Keywords

Identity, landscape, materiality, roadside farming, tillage

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Introduction

The landscape throughout the High Plains of the United States from Ogallala, Nebraska, west to the Laramie and the Big Horn Mountains, and from Limon, Colorado, north to Billings, Montana, reveals little to the untrained eye. The endless grid of county roads extending north–south and east–west divides fields that are often devoid of any vegetation. Distant mountain vistas frame this winter wheat country and provide high-elevation forage for cattle and sheep. Natives to these gridded spaces, through a process of enculturation, are equipped with the emic equivalent of a pertinence principle (Bourdieu, 1984) that provides them with the ability to distinguish key signposts in the landscape and use them as markers of their own and others' identities.

In this article, we show that identity and agricultural landscapes are in a process of co-creation through competing systems of tillage and the ideologies that support them. Specifically, we compare conservation tillage wedded to 'modern' ideologies of scientific farming with conventional tillage newly linked to beliefs about both organic and traditional farming, and examine how farmers use these different forms of tillage to create their identities. In the High Plains, opposing tillage practices create tension between organic and chemical farmers. Up until the second half of the 20th century, aggressive tillage practices in North America dominated the farming scene as the most typical form of pre-planting field preparation (Coughenour and Chamala, 2000). Organic wheat farmers in the High Plains continue to use this type of tillage, which involves an active material engagement with the land as farmers make multiple trips across their fields in tractors to turn the soil using a plow and finely till dirt clumps until they achieve a smooth texture. The result of this material engagement with soil produces a landscape that is dominated visually by bare ground and very little plant residue from the previous season's crop. Conservation tillage came into use in the second half of the 20th century in North America, and this material engagement with the soil produces a very different landscape. Chemical wheat farmers in the High Plains use these methods, which often combine field preparation, planting, and fertilization into one trip across the field using a multi-functional implement specifically designed to minimally disturb the surface of the soil. The result is a landscape dominated by the previous season's crop residue resting on the surface. The material engagement of conservation tillage creates a different experience for farmers as they discontinue the age-old practice of bringing fresh soil to the surface every year to control weeds, aerate soils, and provide nutrients for their crops. Conservation tillage is a material engagement that leaves the soil structure and the sub-soil mysteries it produces intact, thus switching the farmer's toolkit from one dominated by the plow to one dominated by chemical herbicides and fertilizers.

The research here contributes to the ongoing discussion of how identity is formed through day-to-day activities in the material world (e.g. Bender, 2006; Burton, 2004; Dominy, 2001; Egoz et al., 2001; Ingold, 2000; Marion and Nairn, 2011; Miller, 2005; Ramirez-Ferrero, 2005; Tilley, 1994, 2006). As farmers interact with their material world through practice, they re-create the ordering cultural principles and categories that guide their behavior to begin with. For Burton (2012: 54), a farmer's habitus guides behavior that becomes 'etched' on the fields through farm practices, which result in a feedback loop of co-creation as altered landscapes become part of an individual's habitus

(Bourdieu, 1977). In our research, agricultural landscapes are defined as a series of dynamic 'locales' where people engage in activities with their surroundings that shape both the locations and individuals (Tilley, 1994). Loci (or agricultural fields) are specific physical and symbolic settings for individuals to create, transform, and negotiate their identities, which are defined by notions of sameness and otherness within the local farming community (Brubaker and Cooper, 2000; Thompson and Haytko, 1997).

In the context of this article, the rise of modern scientific agricultural practices in a specific historical context meant that the taken-for-granted plow was questioned and became part of a socially constructed binary of modern/traditional. In the High Plains, we show that an ideological tension between tradition and modernity endures. Tilley (2006: 14) suggests that people make symbolic returns to the past through the 'medium of traditional material culture' when they sense a threat to their identities, and in general, threat is felt in the way that the fluidity of cultures, classes, and communities endures as it does on the High Plains. Alternative farming ideologies and practice are both resources that farmers use to manage tensions between constancy and flux in identity, and a cause of that challenging fluidity (Ricoeur, 1992). We show that through management decisions and ultimately the process of creating their fields and crops, farmers assert their identities in an ongoing dialogue with traditional practices. In line with Rabinow et al.'s (2008) findings that the more threatening opposition is not tradition/modernity, but rather tradition/alienation, we show how farmers combat alienation through their particular engagements with material practice and their ideological engagement with tradition and modernity. Finally this article explores how 'roadside farming' (Burton, 2004) continually recreates the divide between organic and chemical farmers and how the origins of this tension can in part be traced to the 1930s North American Dust Bowl.

The High Plains farming community

This article is based on ethnographic research conducted with High Plains farmers as part of a project funded by the United States Department of Agriculture, the Organic Research and Extension Initiative (OREI). The data for this article is derived from interviews with farmers that took place between 2009–2010, which focused on how families in eastern Wyoming and the panhandle of Nebraska perceived changes in the agricultural landscape due to their own and/or their neighbors' organic conversions. From this line of inquiry, identity as tied to fields and practices emerged as an important issue. We conducted follow-up interviews over the phone from February 2011 through June 2011. These interviews tracked any major changes in farm production and organic certification that occurred since the original 2009–2010 phase of the project. The article uses pseudonyms for all references to project farmers.

A total of 18 chemical and organic farmers participated in the first round of interviews, and 16 of the original participants agreed to the follow-up interviews later in the project. Of the original 18 farmers, 11 practice only organic farming, 4 practice both organic and chemical, and 3 practice only chemical farming. The chemical farms range in size from 320 to 10,000 acres. These families are all fourth- or fifth-generation farmers in the High Plains, with one managing a feedlot and one raising cattle on extensive

pasture acreage. Those farms with organic land range in size from 500 to 14,000 acres. Some of these families are also fourth- and fifth-generation High Plains farmers, yet other families settled in the region in the 1940s. Two of the organic farmers are the first generation to raise crops in the High Plains and have deeper farming roots further east. These two families represent a huge minority in Wyoming because they manage two organic dairies in a state with fewer than a dozen dairy operations. Many of the organic farmers support their families through other sources of income derived from businesses as diverse as compost and farming implement sales to the ownership of multiple tanning salons in a nearby city. What unites all the project farmers is their desire to pass their land onto younger family members, although at least three of these families doubt that this will be possible. All of the organic farmers cite economic reasons as their primary motivation for organic certification, but two also name fears of chemical exposure as an additional motivation. Two of the organic farmers readily acknowledge their belief that organic is better for the environment, yet three others dismiss the environmental concerns associated with chemicals as questionable and certainly do not regard it as a primary motivator for organic conversion.

Hard red winter wheat is the staple crop in the High Plains, although some of the project farmers incorporate alfalfa, dry beans, proso millet, oats, peas, and sorghum into their rotations. Dryland farming is more common than irrigation in this region, and when irrigation is used, it is often considered supplemental to rainfall. All but two of the project farmers practice some variation of dryland, strip-fallow farming, with wheat as the main rotation. Thus, there is little variation on the High Plains in terms of crop rotations, planting and harvest schedules, and water management on farms of 300 to 14,000 acres. The most significant divide occurs between those practicing conventional tillage and those practicing no-tillage or minimum tillage with the use of chemicals. It is no coincidence that this division often aligns with the division between organic and chemical farmers, which makes tillage the most important point of contention in the High Plains organic-versus-chemical debate.

Three types of tillage are practiced in the High Plains: no-tillage and minimum tillage used by chemical farmers and conventional tillage, which is used by organic producers. All of the chemical farmers in this study use some method of conservation tillage, although there are none that practice strictly no-tillage. Conservation tillage is a term that encompasses 'minimum or mulch tillage, no-tillage, and stubble mulching' (Coughenour and Chamala, 2000: 17) and involves practices that limit the disturbance of soil. High Plains organic farmers use conventional tillage, which is usually associated with the moldboard plow and continuously disturbs the soil in the process of field preparation and weed control (Baker et al., 2007). Some project farmers use both conservation and conventional tillage on different fields, yet they express a firm ideological adherence to only one system. They explain this discrepancy as the result of environmental factors (e.g. invasive weed problems or rocky soil) that prevent them from fully adopting their ideal system; as Nathan, who has organic and chemical fields said about his ideological orientation:

I firmly believe in a conventional [chemical] system. You spray your stubble after wheat harvest between then and fall ... You spray the growing wheat in early April with LI-240, so it's clean

at harvest. Then you wait for that first flush of volunteer, you spray with Roundup™ ... Then you spray your stubble with a Roundup™ glyphosate to control volunteers.

Nathan cites the opportunity for financial gain as his primary reason for giving up chemicals and adopting organic agriculture with tillage, yet as seen above, he considers chemical farming his ideal system.

No High Plains farmer in the project believes conservation tillage is possible in organic agriculture. High Plains farmers make arguments in favor of both conservation tillage and conventional tillage, and it is often difficult to determine which method creates a higher quality soil, although conventional research endorses no-till methods on High Plains soils (Lafond et al., 2011; Li et al., 2007; Liebig et al., 2004). While soil erosion tends to be at the center of most debates concerning conventional versus conservation tillage, other areas of consideration include yield potential, moisture conservation, and cost per acre (fuel use in conventional tillage vs chemical use in conservation tillage).

Organic farmers and conventional tillage

The main tillage tool used by organic farmers is the moldboard plow. This implement lifts the soil, turns it, and places it back on the ground to bury weeds and crop residue and bring fresh soil to the surface. High Plains farmers often follow their use of the moldboard plow with an implement such as a harrow to break up soil clumps, thus creating a finely tilled, smooth surface without residue:

I still think plowing is an important tool ... you go in there, and it's like you inflate [the soil]. You go in there, and you blade it, turn it. You plow, so air gets in it first thing in the spring, and it might have a little stubble in it. You go in there and work it with a chisel. What you use is up to you, but I have to do a deep tillage; it's just the way our soils are. I have to use one deep tillage practice, so I go in there and chisel it. It's gone; I have no residue lumps at all. (Evan Swanson)

High Plains organic farmers also use the moldboard plow to incorporate applications of compost and manure and to till green manure crops into the soil. Organic farmers state that because they cannot use chemical herbicides to manage their perennial weeds, they must use invasive tillage in the form of the moldboard plow to bury and kill weeds: 'There's no reason for your field to be full of weeds and stuff because that's something a tractor is for' (Randy Gibbons).

Most of the organic farmers we interviewed said that their transition to organic was easy because they did not alter any of their farming practices, including tillage. In other words, while their practice did not align with contemporary scientific farming that takes the form of reduced-till, chemical farming, it was aligned with their ancestral practice, using the moldboard plow to work the soil. These farmers express the sentiment that minimum tillage does half the job and that using the moldboard plow improves the health of soils as evidenced by the presence of more earthworms.

Continued use of the moldboard plow and avoidance of chemicals allow organic farmers to 'renew a deeply patterned cycle ... [of] the movements and practices of the past' (Garner, 2004: 91). Because tilling choices are contested within the farming community,

organic farmers build their identities and provide legitimacy for their choice by recalling the practices of past generations who worked the same land they currently work. When considering the conversion to organic, many farmers invoke the farming practices of their parents and grandparents as evidence that it is a good way to operate: 'Our grandparents successfully did it ... my thoughts were that we would just go back to the way Grandpa farmed, and it works fairly well with wheat' (Henry Noland); 'I farm exactly like my father did fifty years ago ... Everybody farmed the way I do today, fifty years ago' (Randy Gibbons); using the moldboard plow is the 'old way' (Chris Snyder); and 'My grandfather never fertilized. We've been organic since the 1940s; we just didn't have the niche term that goes with it' (Trevor Johnson). By referring to the moldboard plow as the 'old way', organic farmers evoke an idea of tradition that features prominently in their discussions of why they choose to use conventional tillage in organic agriculture. With this idea of tradition, these farmers combat feelings of alienation that choosing not to adopt more 'modern' or scientific practices might spark (Rabinow et al., 2008).

Nine organic project farmers experimented with no-tillage or minimum tillage prior to organic conversion, but switched back to conventional tillage because they believe it is necessary for weed, insect, and disease control. Organic farmers insist that conventional tillage prevents soil compaction in the dense clay soils common to the High Plains. Three of those who experimented with minimum tillage experienced declines in yield, and three others assert that no-tillage is only possible in regions with higher rainfall averages. They explain that more rainfall is needed because continuous cropping (rather than cycles of fallow) is often necessary in no-tillage to break the cycle of weeds, insects, and soil diseases. Randy Gibbons insists that no-tillage and minimum tillage result in additional moisture loss because moisture rises from the sub-surface to the surface at night and 'bakes out' during the day. Conventional tillage prevents this movement by creating a break in soil consistency, thus providing a barrier to rising moisture.

Organic farming in these communities is often met with criticism and ridicule. As farmers convert to organic production, they are called 'hippies, tree huggers, vegans, members of PETA, and truck farmers' who wear 'bandannas, tie-dyed T-shirts, and earrings'. This is an identity designation High Plains organic farmers do not appreciate. They do not wish to align themselves with the conservation principles associated with the larger organic movement and cite the economic benefits of organic production as more important than any environmental benefits. As the identity of these organic farmers is contested, they make a symbolic return to the past through the 'medium of material culture' (Tilley, 2006: 14) by evoking the practices of their pioneering forbears. Thus, they continue using the moldboard plow and strip farming, and in this way they 'retreat from the uncertainties of the present' and evoke an identity of tradition. This enables them to enjoy the economic advantages of organic farming, while distancing themselves from the identity value associated with the broader organic community.

Punctuating this tension, High Plains organic farmers criticize chemical farmers for their use of harmful substances on the land, and for the lack of time they allegedly spend working the fields. In fact, it is true that chemical farmers do not spend as much time preparing the soils as organic farmers; spraying is a much faster process than tillage. With no-tillage seed drills, chemical farmers can prepare, fertilize, and plant their soils in one trip across the field (Baker et al., 2007).

Organic farmers often say that they never see chemical farmers on the fields, and accuse chemical farmers of using their spare time for exotic leisure activities. Trevor Johnson: 'The other guys get to go water skiing because they spray their fields and leave, we're out there working the fields.' On a similar note, Evan Swanson says, 'They've [chemical farmers] gotten lazy. They go out there and spray 500 acres in a day and then go to the golf course for 2 weeks.' Vince Lowe expresses a more severe opinion by stating: 'People today don't farm. They go out there and pull the sprayer and spray.' While the temporal facts organic farmers notice are true, at issue here is how each farming group uses practices to illustrate that their way of farming is better, smarter, and more authentic. When organic farmers virulently attack chemical farmers as lazy at best and as non-farmers at worst, they imply that a farming identity is restricted only to those who till. Thus, we see how tillage praxis enters the dynamic creation of meaning and identity. Engaging in tillage on the landscape is an active process that, as we saw above, organic farmers use, finding that it connects them to the practices of their grandparents and supports their identity as traditional farmers.

Chemical farmers and conservation tillage

Most chemical farmers use some combination of no-tillage and minimum tillage; both are referred to as conservation tillage because, unlike the moldboard plow, they are less invasive and preserve the soil's natural structure (Baker et al., 2007). No-tillage farm systems never mechanically disturb the soil to prepare fields for planting, while minimum tillage uses tools such as chisels, discs, and blade plows to work the soil near the surface without turning it. No-tillage and minimum tillage prevent erosion by leaving the residue of past crops on the surface to stabilize the soil underneath. Those using conservation tillage in the High Plains also use chemical fertilizers and herbicides. Herbicides must be used because without tillage, there is no way to bury perennial weeds and residual crops to prevent competition with the growing crop. Both no-tillage and minimum tillage farmers use specialized no-till seed drills to plant and use sprayers hooked onto tractors to apply herbicides and top-dress fertilizers. Chemical farmers use synthetic liquid fertilizers that can also be drilled in with the seed during planting. Some of the practices described by chemical farmers include direct fertilizer placement in the row, the use of dual-feed fertilizers when planting, the use of Roundup™ to treat stubble in the fall for weed suppression, the use of folio fertilizers, and the use of mono-ammonium phosphate to make the phosphorus 'available' in the region's high-pH soils.

High Plains chemical farmers cite their avoidance of tillage as one key behavior that distinguishes them from others. Mitch Cullen recently put some of his Conservation Reserve Program (CRP) land back into production but says that with his chemical no-till method, the soils will 'never be stirred mechanically'. Chemical farmer Matt Duncan hopes to move away from the moldboard plow as much as possible in the future because he considers it 'dangerous'. He also warns: 'If you don't know what you're doing, and go in here and plow it up, you're going to undo about 50 years of work in a year or less.' John Newberry adopted minimum-tillage methods because he could not justify 'pulling iron around all summer'. Like the other chemical farmers above, John replaces tillage practices in his identity creation work with the complicated crop rotations, herbicide

applications, and fertilizer placements that are necessary in minimum tillage and no-tillage farming:

I use a lot of liquids on the wheat because we usually do what we call 'a weed and feed' on it in the spring; we shoot on some nitrogen and a little sulfur ... and then we usually put on a herbicide at that time in the spring and usually in my summer and fall feed ... The spring crops, with the row-crop stuff, are almost entirely liquid ... I've got an air-seeder out here, and I use dry when I plant the wheat and millet, and it shoots it right down in the row ... well, and of course, even with a no-till wheat, I'll usually come back in the spring and do a weed and feed again.

Mitch Cullen considers his family of chemical farmers 'not so much innovators, but ... adaptors'. He describes his crop rotations with the following words:

We take advantage of the interaction of the different crops. Corn, even though this is not corn country, under irrigation, corn has an impact on the other crops that we've chosen, and it benefits specifically from the other crops that we've chosen for our rotation. So corn follows wheat; beans follow corn; that is a two-cycle rotation, wherever the water will allow that. Then six years of alfalfa and back to corn, beans, wheat, alfalfa ... Then of course, the wheat crop is a natural because the beans come out, we level the ground, plant the wheat, the bean crop has left 60 pounds of nitrogen, and the fertilizer for the wheat, and of course, the alfalfa leaves a substantial amount of nitrogen for the corn to utilize that. So on the High Plains at 5400 feet high, we can't let anything slip away. We have to maximize the effect of any resource, whether it is sunshine, which we hardly get enough for corn, or the animal waste, which is obviously good for all of those crops. But the proper sequencing of those is a critical piece.

What this quotation shows is that crop rotation constitutes a complex discourse that evokes the language of 'modern' scientific farm management, referring to knowledge of soil chemistry and water management that can be found in more technical language in scientific studies such as Lafond et al. (2011), Liebig et al. (2004) and Li et al. (2007). Mastering these techniques is a sign of the farmer's mastery of nature – or as close as one can get – an important trope in scientific farming. As High Plains farmers adopt conservation tillage and chemical farming, they use the tools and ideologies that constitute these practices to create modern identities rooted in science, stewardship, and business skills. Farming like grandpa is not seen as sustainable by these farmers:

Not robbing the asset, enjoy what you're doing, and it's economically sound. That's sustainable. It has nothing to do with chemicals or fertilizers because those things tend more to be religions than realities. That's the struggle I have with the definition some people give to sustainable, especially in terms of agriculture. We know that what Grandpa started here wasn't sustainable, because he was responding to a government program. (Mitch Cullen)

Thus, chemical farmers contest the validity of a 'good farmer' identity being built on heritage. In addition, these farmers demand veritable statistics before adopting any new practice to make sure it is 'economically sound' and an effective addition to their farming operations. Matt Duncan is critical of organics because he says: 'I'm not so sure that that's [organics] based on sound science. I'm a dork as far as economics and statistics

[are concerned]; I'm like, show me the statistics.' Three main themes emerged at the forefront of chemical farmers' management practices: stewardship, science, and economics. They place these themes in opposition to more traditional farming practices and use them to create identity value.

John Newberry, a chemical farmer, highlights the distinction between tillage practices he uses and those of organic farmers:

Q1: Why has the organic stuff been unappealing to you?

J: Because I can't use chemicals. How do you start a no-till system if you can't use chemicals ... if they'd let you use Roundup™, at least you could go in there and control your grasses.

High Plains chemical farmers explain organic farmers' commitment to the plow as a failure to move on to better methods – of 'aiming for progress' in short – because they are 'locked into doing things a certain way', 'still stuck in the old strip-till kind of planting' (Matt Duncan), and Mitch says: 'Nature itself does a better job of soil structure with less cost than we can do.' He goes on:

The problem with organic in highly erodible soils is that once you take chemicals out, you force tillage in, so if you're willing to let your soils suffer and sacrifice your future, you may make a short-term gain ... [organic agriculture] might be sustainable philosophically, and it might be sustainable for the soil, maybe, but it's going to force a plow into the ground that the government told my grandfather to put there and found out 30 years later it was the wrong thing to do.

The chemical farmers distance themselves from the purportedly soil-eroding practices of organic farmers and seek to align themselves with the natural processes by which soil achieves health and structure.

Roadside farming: Weeds and soil

Farmers continuously monitor the management practices of one another through conversation and through 'roadside farming' (Burton, 2004), i.e. they scrutinize the fields of other farmers to determine whether or not the farmer is skilled in making competent management decisions. In addition, farmers use roadside farming to help build their identity via opposition to otherness (Ricoeur, 1992). As farmers observe and criticize the practices and impacts of their fellow farmers, they are able to create identity by classifying what they are and what they are not. Organic farmer Rebecca Lowe highlights the importance of this practice:

We have a field that's in the middle of a section ... There's hardly ever anybody down there because we were the only ones that farm down there. About third or fourth year that we were organic, I think that's where we planted the sunflowers. It happened that Daniel and I went over there to look at it, and that road was like Grand Central Station. We found out that all the neighbors had been going down and looking; they wanted to see.

The farmers were out looking for weeds in their fields (dirty fields), uneven planting, and unhealthy crops, which are all perceived as indications of incompetence and laziness. Weeds provide a particularly compelling aspect of evaluation because most weeds are easily observable from nearby roads. They indicate a farmer's lack of control over the land and are a key sign of threat to productivity because they compete with the growing crop. Yield or per acre productivity is a symbol central to the mission of modern scientific farming around which the vast apparatus of agricultural chemicals, crop breeding, and green revolution technologies has been built. None of our respondents wanted to challenge this tenet of modern farming ideology.

As a result, our farmers are very attentive to weeds, whether they use chemicals, tillage, or soil amendments to control them. John Newberry, one of the project chemical farmers describes the threat, saying: 'There are several big ones [weeds] that we deal with here, but the primary one is cheat grass tectorum. If you can't control that one, that one will eat your lunch.' Concerned chemical farmer Randy Gibbons has adapted some of his equipment to weed control:

So we've got two cultivators: we have a small one for light-duty jobs, and we've got an alloy one that's built for minimum-till. We don't use it that way, but it was built for minimum-till ... If we start getting weeds growing in the row, then we'll put a ditching shoe on there, which will go through the field at 5½ mph and just till the whole thing. We'll just cover up the whole root, the weeds and everything, and by the time the weeds start to grow back, sunflowers have gotten such a head start on everything.

Another of our conventional tillage informants speaks of his ongoing scrutiny of potential weed problems, which he resolves through soil amendments:

My consultant has told me that most weeds are in an area for a reason, and I guess it's hard in my little mind to figure that out. But we've been treating those areas that had specific weed or a specific problem, and most of them are just really small areas. It's not a major expense. It's just kind of time-consuming. And I did that again last year, and I noticed that the thistle didn't amount to much last year. Well, there's none there as of now and in the ditch right across the road from this, thistle is already 12, 14 inches tall, so I know it would have been there if it was gonna be there. (Evan Swanson)

Two things are notable in this excerpt. The first is the minute attention Evan pays to weeds. He spends significant resources improving a small patch of land within his vast property to deploy it as a badge of honor. The second thing we notice is his attention to the thistles growing in a neighbor's ditch, which Evan implies is evidence of his own superior diligence and management and his neighbor's questionable moral character.

Soil is another aspect of evaluation for farmers because, like weeds, soil erosion is readily observable and is another perceived indication of a farmer's level of skill and dedication to stewardship (Coughenour and Chamala, 2000). Thus, evidence of soil erosion affects High Plains farmers' opinions of their neighbors; throughout the interviews, we heard many negative comments about neighbors and their blowing soil. Organic farmer Nick Keller says:

On a windy day if you see that stuff that's chemical fallow, as opposed to stuff that is plowed like ours, you'll have dirt in your hair. You'd be surprised how many talk about how safe the soil is; it blows too.

In this quote, Nick is denying that plowing causes more soil erosion than minimum tillage chemical farming. Randy Gibbons, an organic farmer in Nebraska, also says: 'Wind erosion is our problem. Most of us learned how to farm, so we don't have much.' Nancy Newman says of their neighbor's topsoil:

When we had blowing snow, and it had just started, after a while the neighbor's [topsoil] started blowing, and it ended up on [our] windows. If you were a geology student, and you like the layers of the canyon walls and stuff – that's what it looked like.

Nancy later goes on to compare her husband's soil management with their neighbor's and calls her husband a 'good farmer'. In the spirit of the conventional tilled/minimum tilled debate, organic farmer Nick Keller says: 'I had ground next to a guy who's a chemical farmer. He minimum tills his chemicals and his ground was blowing a lot worse than mine was.'

The invidious comparisons in this debate flow from both sides. Chemical farmer Mitch Cullen is highly critical of invasive tillage and says: 'What I'm seeing in some of the soil and wind erosion, I'm seeing 30-year mistakes being made that in one year can do enough erosion damage that it takes 30 years to bring that soil back.' In his first interview, Mitch talked a great deal about the dangers of using a plow and said:

The thing we despise the most is the nemesis we have in this country, which will turn into an asset [wind energy] eventually and has at different times. That's the wind. And the wind waters our cattle and cleans our air, but it shouldn't destroy our soil, and it won't if we do our jobs.

This quote not only reflects a sophisticated understanding of wind as threat and energy resource, it highlights how soil is a major part of how farmers in the High Plains evaluate one another's management skills. Roadside farming observations are in the arena of evaluation where symbolic capital, meaning respect and honorability, is lost and gained (Bourdieu, 1984). If High Plains farmers fail to keep weeds under control and soils stabilized, it indicates failed stewardship responsibilities, which may result in the loss of symbolic capital. These perceptions contribute to their overall standing in the community as good (vs not good) farmers (Burton, 2012; Egoz et al., 2001; Ramirez-Ferrero, 2005; Salamon, 1992).

The Dust Bowl legacy

An examination of the legacy of the Dust Bowl in the High Plains can be useful in understanding why tillage practices are inherently connected to identity for these farmers. While we never specifically questioned farmers about the Dust Bowl, they continually referenced the event when describing their tillage practices and those of their neighbors ('It's [organic production] going to force a plow into the ground that the government told

my grandfather to put there and found out 30 years later it was the wrong thing to do'). We look at two different aspects of the Dust Bowl. First, as a result of the devastating ecological damage left following the Dust Bowl, soil erosion is at the forefront of farmer evaluations of one another. Second, the soil conservation practices and tools that came as a result of the Dust Bowl have given farmers alternative discursive resources for identity creation to those associated with the pioneering approaches of their great-grandparents.

As the sky darkened with dust in the 1930s, Americans began questioning the competence exalted in the Jeffersonian American icon, the yeoman farmer (Marx, 1964; Peterson, 1990; Salamon, 1992). The yeoman farmer held a particularly important role in American ideology and mythology, for it was he who cultivated and civilized the land to pave the way for western migration (Cannavo, 2001; Marx, 1964; Press and Arnould, 2011; Salamon, 1992). Jefferson celebrated the qualities of the yeoman farmer, including his simplicity of wants, independence, frugality, industriousness, and dedication to family (Strand, 2011). For Jefferson, democracy appeared within reach, for the abundance of land out west ensured that all farmers could live in an 'egalitarian society of small property holders' (Cannavo, 2001: 77). In this battle of civilization on the plains, farmers employed the plow as their weapon of choice. As Coughenour and Chamala (2000: 4) state:

The farmer patiently hewing the forest and breaking the sod was a splendid instrument of civilization and national purpose. The chief tools of his craft – the axe and the plow – were key weapons in a much larger, transcendental struggle than the mere preparation of open, sun-filled fields of wheat and corn. As civilization's armament, they bore the moral force of the sword Excalibur, enabling the farmer to fulfill America's destiny.

This quotation highlights the symbolic potency of the plow as a key metaphor in the lives of High Plains farmers (Tilley, 2006). The plow represented the larger efforts of European settlers to transform and control the newly homesteaded land and all of its human and non-human inhabitants. The plow represented the first step in the life-sustaining processes that recreated a civilized community in these untamed lands (Coughenour and Chamala, 2000). But beginning with the devastating events of the Dust Bowl, the fear of erosion became inextricably embedded in the agricultural landscape of the High Plains (Coughenour and Chamala, 2000; Helms, 1990; Nelson, 1997). This catastrophe added additional moral layers to landscapes in agricultural communities, and as a result of the Dust Bowl, soil took on a primary role in farmers' evaluations of one another and in their creations of identity. The Dust Bowl, along with research in conservation tillage, government incentives for conservation tillage, and new chemical and mechanical innovations, gave modern-day chemical farmers in the US a new set of practices to create their farms as 'portraits' of themselves (Burton, 2004).

The moldboard plow – friend or foe?

Prior to the 1930s, the plow dominated American farming culture (Coughenour and Chamala, 2000). Technically speaking, farmers and university researchers applauded heavy steel plows that broke dense clays, improved efficiency, and created clean soils

(Fitzgerald, 2003). When farmers talk about using the moldboard plow, a tool of their forbears, they pay homage to the legacy of Western conquest and evoke the symbolism associated with the plow's role in bringing civilization to the High Plains. The government encouraged the use of the steel plow, for in the midst of World War I they pushed farmers to maximize production and efficiency as part of the hometown war effort. Many of our informants' evident pride in their massive new tractors and other equipment and pride in their productivity continue the technophilial tradition rooted in the plow's legacy.

This push for maximum production during World War I, linked to use of the moldboard plow during a devastating drought, led to the Dust Bowl of the 1930s. During that time, estimates suggest that 282 million acres of land, including 50 million acres of cropland, were destroyed by erosion (Bennett, 1939). Another 100 million acres were severely damaged, yet these numbers fail to account for the long-lasting cultural effects of the storms of dust that engulfed communities all across the US. Thus, America's plow culture faced a crisis of legitimacy costing farmers some of their quasi-mythical status as icons of pastoral America.

In 1935, Hugh Hammond Bennett convinced the Senate Public Lands Committee to create the Soil Conservation Service (Coughenour and Chamala, 2000; Helms, 1990; Nelson, 1997). Advocates for soil conservation such as Jim Roe, Bennett, and Edward Faulkner vilified the moldboard plow and equated soil erosion with poison, killing farms and endangering an important American resource. The government supported these efforts and produced a film titled *The Plow That Broke the Plains* in 1937. The film gives a brief overview of agriculture in the Great Plains from the time the 'Indian and buffalo' were removed, through World War I, and into the Great Depression (US Documentary Film, 1937). It depicts farmers first using the horse for plowing but later adopting heavy tractors and steel plows. The film is replete with scenes of people fleeing from waves of dust, stark landscapes scattered with unused farm equipment, a disillusioned housewife sweeping dust off her porch, a dirty baby playing near a plow in the dust, and a dying dog. The narrator warns, 'Plowman, plow at your peril', and the film ends with a family packing a truck to head further west, while the narrator says:

Baked out, blown out, and broke. Year in, year out, uncomplaining, they fought the worst drought in history. Their stock choked to death on the barren land. Their homes were nightmares of swirling dust night and day. (US Documentary Film, 1937)

These historical events and later university-supported research inspired the federal government to pass a series of policies and plans that supported conservation tillage. These included the creation of the Soil Conservation Service in 1935, the Conservation Reserve Program (CRP) in 1956, and the Enactment of Food Security Act (part of the Farm Bill) in 1985 (Coughenour and Chamala, 2000; Helms, 1990; Nelson, 1997). The CRP created a 'soil bank' by paying farmers to take highly erodible land out of production for 10 years. Many of the High Plains project farmers have CRP contracts, and most renewed those contracts in 2010 for an additional 10 years. Beginning in the 1950s, the government provided financial support to those farmers willing to adopt such radically innovative conservation measures as stubble mulching, contour plowing, terracing, and

ridge planting (Maher, 2000). In addition to government support, technology continued to evolve to make conservation tillage more accessible and more successful in the High Plains. Herbicides came on the market after World War II. The Allis-Chalmers no-till planter was manufactured starting in 1966, and no-till seed drills have continued to improve in efficiency and performance. The advent of conservation practices and equipment gave High Plains farmers an entirely new way to engage with their fields and create a different idea of themselves as farmers. It is through these complex, intensive, new management practices that they identify now as stewards of the soil. Overall, these developments in technology and government policies encourage farmers to adopt new practices in their soil management and in their engagements with agricultural landscapes.

Although the great dust storms of the 1930s occurred many decades ago, the events of that period are both physically and mentally embedded in the agricultural landscapes of the US. As Tilley (1994) explains, landscapes are sculptures of human agency that are never complete. They are both the 'medium for and outcome of action and previous histories of action' (p. 23). Writing of the dwelling perspective, Ingold (2000: 189) states: 'The landscape is constituted as an enduring record of – and testimony to – the lives and works of past generations who have dwelt within in, and in doing so, have left there something of themselves.' Thus, the Dust Bowl has never left the High Plains. In the practices of those farmers who lived during the Dirty Thirties and the national response following these practices, a moral drama unfolded on the landscape as farmers faced new doubts about their stewardship. After this traumatic time, farmers elevated soil as one of the main symbols used to evaluate the skill of other farmers, as illustrated in this article.

Overall, there is a deep well of cultural resources available to High Plains farmers as they create and debate identity. Some of these resources stem from the technical and symbolic legacy of the Dust Bowl, while others are generated through the long-term management of family land using the same tillage practices that were first used to cultivate the land (Ramirez-Ferrero, 2005). The concept of tradition is aligned with the use of the moldboard plow and employed strategically by organic farmers to embed this practice in the past, thus increasing the legitimacy and authority of organic farming (Anderson, 1991; Hobsbawm and Ranger, 1983). The soil conservation practices of chemical farmers are also embedded in the past and used to define soil stewardship. These dual processes both invoke High Plains agricultural history to create boundaries between organic and chemical farmers, which inevitably act as opposing guides for appropriate action in the High Plains (Clifford, 2004; Schochet, 2004).

Conclusion

As High Plains organic and chemical farmers carry out practical activities on their fields and engage in roadside farming, they create identity value. In the context of commodity production, it is farm praxis and tillage process, and not the final product, that create farmers' identities. Indeed, many informants are vague about what becomes of their wheat after harvest, for they sell their crops to buyers that supply multiple companies. Thus, we have tried to illustrate that organic and chemical farmers manage their soils

using different processes that draw on different cultural resources, which in turn, provide distinctive identity orientations. Organic farmers use conventional tillage to control their weeds and prepare their fields for planting. Conventional tillage means that these farmers spend a great deal of time on their fields actively turning the soils with the moldboard plow, the historical and symbolic significance of which we have discussed above, and refining the soil's texture with other smaller implements. They make multiple trips across their fields every year and through these conventional tillage practices connect with their forebears' activities and produce a farming identity rooted in (a notion of) tradition. It is difficult for these farmers to abandon conventional tillage because of its identity value. The plow remains central to their material engagement with the soil, which creates a landscape of residue-free, finely tilled land. Their continual use of the plow connects them to the practices of their grandparents, who relied exclusively on the plow to bring fresh soil to the surface each year to control weeds and manage crop nutrients.

In contrast, chemical farmers draw meaning from the moral drama that unfolded on agricultural landscapes during and after the Dust Bowl. New technology and allegedly scientific methods of managing the soil developed, giving farmers not merely an alternative to existing plow culture (Coughenour and Chamala, 2000) but also to an alternative morality embedded in modernist notions of science, progress, and technology (Kozinets, 2008). In the High Plains, modernity did not distance farmers from their fields and the practices that constitute their identities; it gave them a new suite of tools and strategies to assist in their creative engagement with the fields. High Plains chemical farmers use conservation methods to define themselves as active stewards of the land rather than passive traditionalists. As these farmers distance themselves from the plow, they focus on technology, such as no-till seed drills that prepare the soil, plant the seed, and fertilize in one tractor trip across the field. This material engagement leaves a plant residue on the surface, which gives the landscape a different appearance from that of organic farmers with their finely tilled, tidy fields. The material engagement of chemical farmers creates a different sensory experience, as they no longer smell the fresh soil as it comes to the surface behind a sharp, sleek plow. They spend less time on their fields and rarely explore the subsoil mysteries of their land by tearing the surface apart with a plow. Their management decisions are due to the meaning they draw from their active engagement with the agricultural landscapes. Much of this meaning is informed by the terrifying and humiliating events of the 1930s Dust Bowl, as demonstrated by references to the dangers of undoing their investments with careless plowing.

In addition to practices on the fields, we have shown that roadside farming has identity value in the High Plains. Farmers cannot describe the practices they embrace without comparing them to the ones they resist. Indeed, they cannot describe their philosophies on farming without comparing them to the philosophies of others. While the practice of driving dirt roads and observing fields may seem mundane to the outsider, this is essential to ordering relationships between farmers and ascribing unique identities within these relationships. Farming provides a special opportunity for such comparisons because if individual identity is the result of practices on the fields, then fields are the material manifestations of individuals. Observing fields gives cultural insiders limitless opportunities to evaluate relevant others. Insiders equipped with a High Plains pertinence

principle recognize certain attributes of fields, which expose individual farmers' management decisions.

We have shown that fields in the High Plains are 'locales', for they provide a specific physical and symbolic setting for farmers to create, transform, and negotiate their identities (Tilley, 2010). The agricultural landscape encompasses physical fields but, as with landscapes generally (Bender, 2006; Cosgrove, 2006), goes beyond these physical settings to include the 'conventional and normative meanings' created as a result of day-to-day activities on the land through generations of farmers, the socio-political context of agriculture in the High Plains, and specific historical events such as the Dust Bowl (Tilley, 2006). Specifically, conventional and normative meanings that are re-enacted as High Plains farmers till their fields include emic concepts of tradition and stewardship of the soil. Of importance to the study of landscape, we suggest that the agricultural landscape of the High Plains is heteroglossic. Communicative practice in a given society, as Bakhtin (1982) conceives of it, entails both a centripetal, unifying aspect tending toward a single cohesive ideological system and a centrifugal aspect marked by stratification and diversity. These coexisting dominant and oppositional discourses give rise to situations of heteroglossia. This perspective sheds light on the dynamics of identity work in tillage practices in the High Plains. All the farmers in our study share a belief in the agrarian way of life as a morally superior path; all make a commitment to stewardship and care of the soil; and all drink at the well of 'tradition', when they feel a threat to their identities and as an antidote to the alienation they experience in the market. However, for chemical farmers, stewardship means those practices of judicious innovation in tillage based on modern, scientific farming discourse that grew out of the aftermath of the Dust Bowl, and materialized in equipment, chemicals, equipment, and rotations. For organic farmers, stewardship means those tillage practices that bind them closely to care of the soil through tillage, manuring/composting, rotation, careful micro applications of soil amendments, and to tried and true methods pioneered by their forefathers. Each set of practices is both exclusionary and inclusionary, thus drawing boundaries around preferred identities with every pull of the plow or chemical shower on the land.

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Note

1. The organic farmers in this project are all certified through the United States Department of Agriculture National Organic Program (NOP), which regulates all on-farm practices, including the use of inputs such as fertilizers and herbicides, equipment cleaning, and storage facilities. Farmers must certify their land through the NOP before they can sell their crops as organic. This involves a three-year transition period in which farmers cannot use any inputs (i.e. seed, fertilizers, and herbicides) that are not on the NOP approved list. They must continue to avoid these inputs after transition, clean their equipment (i.e. plows and harvesters) after contact with non-organic crops, and store organic crops separately from non-organic crops. The chemical farmers in this project do not go through any formal process to certify their crops or sell them in a specialized market. The title 'chemical farmers' is used by the authors of this article to group together those non-organic farmers who use conservation tillage. The

use of synthetic chemicals by these farmers is largely unregulated by federal and state governments. Farmers began using synthetic chemicals such as anhydrous ammonia in the late 1930s and early 1940s. These chemicals largely replaced manure as the primary source of fertilization, and tillage as the main method of weed control (Fitzgerald, 2003; Coughenour and Chamala, 2000). Thus, farmers decreased their use of tillage as they increased their use of chemical herbicides. These methods required less human labor and improved efficiency in terms of fuel use in tractors and time spent on the fields. The combination of reduced tillage and increased chemical use is called conservation tillage because, beginning in the 1930s, agricultural scientists began valuing these methods for their potential to reduce soil erosion and preserve the structure of soils. As these methods became known as conservation tillage, in contrast, the use of plows to turn the soil became known as conventional tillage.

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