

Environmental Drivers for the Future – where Conservation Tillage may have a role in meeting environmental objectives

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Farming the land of our grandchildren

Our planet is changing, perhaps at rates not seen before in human history. Globally, there are worries of warming climates, waning water sources, diminishing biodiversity, and depleting pools of cheap clean energy. Beyond these, stands the daunting challenge of feeding the growing billions of us scurrying about on a shrinking earth. These global changes affect us also locally, perhaps especially our farmlands – they will influence the crops we grow, the way we manage the soil, the way we live on the land. And further, meeting the coming global challenges, will depend on wisely nurturing our lands locally.

That raises the question: how do we farm the land of our grandchildren? I choose this subtitle carefully, deliberately. ‘Farming’ denotes a broad perspective; conservation tillage systems, for example, were never solely defined by tillage – they encompassed a wider strategy and attitude. And I say ‘grandchildren’ to evoke the seamless continuity of our influence on the land: the choices we make are influenced by those made long ago, and the way the land looks decades from now depends on what we do today.

Central to the question of ‘how to farm the land of our grandchildren’ is our concept of ‘land’. Sharon Butala¹, distinguished Saskatchewan author, said: “At the end of the twentieth century and beginning of the twenty-first, I was hardly alone in asking: *What is the meaning of land?* It is turning out to be the central question of the new millennium.” In this essay, I will explore the hypothesis that our meaning of land has shifted and expanded over the decades, and further, that it may need to grow further as we embrace the challenges awaiting our grandchildren.

‘Land’ as soil

Soon after our prairie lands were first broken, worries arose about rapidly depleting soils. The “great depth and high fertility of the prairie soils come to us as an accumulated legacy...”, wrote Shutt² in 1910, “one which, looking to the future prosperity of the west, we shall do well to conserve by rational methods of farming”. And though it took some decades, and though some challenges remain, we have witnessed remarkable progress in developing such ‘rational methods’. Foremost among them, no doubt, was the advent of conservation tillage. Not only does it hold the soil in place, finally taming the blowing winds that ravaged the land, but it holds in the moisture, often making it possible to grow crops consistently without the depletive practice of summer fallow.

‘Land’ as ecosystem

Preserving and building the soil, the early focus of 'land', then, is the crowning achievement of conservation tillage to date. But now we see, ever more clearly, that 'land' is more than soil, not just the thin and fragile layer in which we plant our seeds: land includes also the sky above, the waters within, the creatures upon, the trees adjacent, and all their myriad interactions, with each other and their place, in interwoven harmony. Long ago, Tansley³ (1935) called this intertwined assemblage an ecosystem. And this perspective of ecosystem broadens the questions we ask when we ponder the virtues of new farming practices. We still ask: how might this new practice affect the enduring fertility of our soils? But to that question we add: and how does it affect the air, the water, the wildlife, the biota within the soils?

One of the first examples of our new ecosystem perspective is the process of carbon sequestration: the realization that when we build soil carbon, we not only improve the land but also repair the air. The carbon in organic matter, so vital to our soils, comes from the air; so if we increase soil carbon by one tonne, that means there is one less tonne of carbon in the air as CO₂, the principal greenhouse gas linked to global warming. Thus conserving the soil, through practices like conservation tillage and continuous cropping, affects also the air, with all its cascading consequences.

But carbon sequestration and reducing greenhouse gas emissions is only one example of challenges and opportunities in the new ecosystem perspective. For example, as we develop tillage practices further, we may need to look also at the interactions with livestock: How do you apply manures efficiently to a no-till system? How do you best build crop rotations enfolded perennial crops without extensive disturbance? And further, we may need to think more deliberately about other constituents of our ecosystems: the trees on the margins of our fields, the wetlands within them, the birds that nest upon them and the wildlife that seek refuge there. And as water becomes an ever more urgent issue, we may need to look more carefully at how our practices on the land affect the water beneath our fields and the water flowing from them, into the streams and eventually lakes and rivers that connect to them.

All of the myriad species within an ecosystem are connected by flows of energy and nutrients; and further, all ecosystems themselves are connected by these same pathways. That means that what we do on the land reaches far beyond our farm fences. This broadening of view in the ecosystem perspective makes the challenge bigger; but also amplifies the benefits of good farming practices.

'Land' as community

Most of us, now, see land as ecosystem. Though many vexing and enticing questions remain, we have begun to make progress within this expanded perspective. But, I propose, there is still a higher, broader vantage from which to observe and manage the land: the community. By 'community', I mean not only the ecosystems but also all the people who live and depend on them. To put it another way: in the past we improved the way we *treated* the land; in the future we will need to know better how to *live* on the land.

We derive many things from the land. Some of them are obvious: the land gives us food, fiber, and fuel. Some are less obvious: the land gives us livelihood, it filters our air, cleanses our water, and decomposes our wastes. And still others are so subtle we cannot even quantify them, except to know that without them we would be deeply impoverished: the trill of a meadow lark at dawn, the smell of newly-mown hay, the freshness of air after summer storm. In the future we will need to learn how best to till the land, how best to manage the land to preserve and augment all of these wonders, and ourselves among them.

Much of the wisdom on how to live on the land resides in those who walk upon it daily – the farmers and ranchers. For example, much of the creative thought in developing conservation tillage practices came from farmers; without their deep insights and innovative spirit, our systems would not have advanced to where they are today. And future innovations, too, will lean heavily on the wisdom of those rooted in the soil.

But it is not only farmers and ranchers who depend on and influence the land. Our greenhouse gas studies, for example, have shown us that we are all connected, no matter where we reside. The carbon sequestered on a farmers' field benefits also the urban cousin; the demands for food and fuel of the city resident dictate what happens on the farmers' fields. The challenge, then, in coming decades will be, first, to tell more eloquently the stories of our mutual dependence, and then to design farming systems that meet the many demands of all upon the land, while keeping the land productive, vibrant, and flourishing for the generations coming. One way or another, we are all tied to the land.

Closing thoughts

We who care for the land face some vexing challenges. As one writer⁴ defined it: “one key challenge for the 21st century is how to produce the food we need, yet ensure the landscape we want.” This prospect is more than a problem – it is an invitation to dream and to explore. We get to face deep, enticing questions: what do we want the lands of our grandchildren to look like? And how do we make them look that way? Those who developed conservation tillage have shown us the power of far-sighted thinking. Though deemed initially to be unrealistic, these practices have now transformed the landscapes in ways few could have imagined. May we be inspired by our predecessors' boldness, to explore new dreams for the land of our grandchildren.

Sources

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