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Stewardship in Iowa crop production systems

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How well are we managing our resources? Genetic? Transgenic? Residue? Soils? Water?

'Poverty' in the midst of plenty?

"Two Haitian corn growers joined our shade-seeking group, evading for a few moments southwest Haiti's intense tropical sun. It was near midday in early August 2010, and Haiti sweltered with temperatures and humidity rivaling the heart of an Iowa corn field at the height of summer. Around us, the oppressive weather conditions seemed to continue 24/7 with no break. Thunderstorms rolled through, but instead of cooling, they often only increased Haiti's humidity even more.

In the brief shady reprieve of a cluster of Haitian fruit trees and palms, the young and old farmer discussed advantages of small-scale tractors and tillage implements in their cropping systems compared to plowing by oxen or hoeing by hand: poor comparisons, dramatic contrasts – but for an impoverished nation like Haiti, such discussions reflect the harsh realities of life.

The January 2010 earthquake devastated this country already ravaged by decades of abuse and neglect from both natural and human disasters. Interestingly, in the eighteenth century St. Dominique – what we now call Haiti – was known as the "Pearl of the Antilles," and was the richest colony in the French Empire. There is little luster in the pearl today." (Elmore, 2010)

A glimpse of Haiti – video

In contrast to the video presented during the oral ICM Conference session, Iowa and the U.S. as a whole no doubt are viewed as the epitome of productivity and success agriculturally and otherwise by a large portion of the 'majority' world – people in less developed countries including Haiti. Yet, I am inclined to think that Iowa agriculture is 'poor' in at least some senses. How can I say that?

First, let's think about what causes poverty? Corbett and Fikkert (2012) provide some concepts for us to think about. What causes poverty? One cause perhaps is a lack of knowledge; if so the response is education. If we think the cause is oppression by a powerful opponent, then we work for social justice. Perhaps poverty is the result of unfortunate decisions on the part of the now impoverished? If so, we try to help them work through those issues. If the poor lack material possessions, we provide material resources. But often those approaches do more harm than good. In any case, a sound diagnosis is needed before administering help.

Another way to look at poverty is through the presence and strength of relationships. Corbett and Fikkert (2012, citing Bryant Myers, 1999), contend that we operate among four different relationship spheres. These relationships are shown in Figure 1; please fill-in the ellipses during the ICM session:

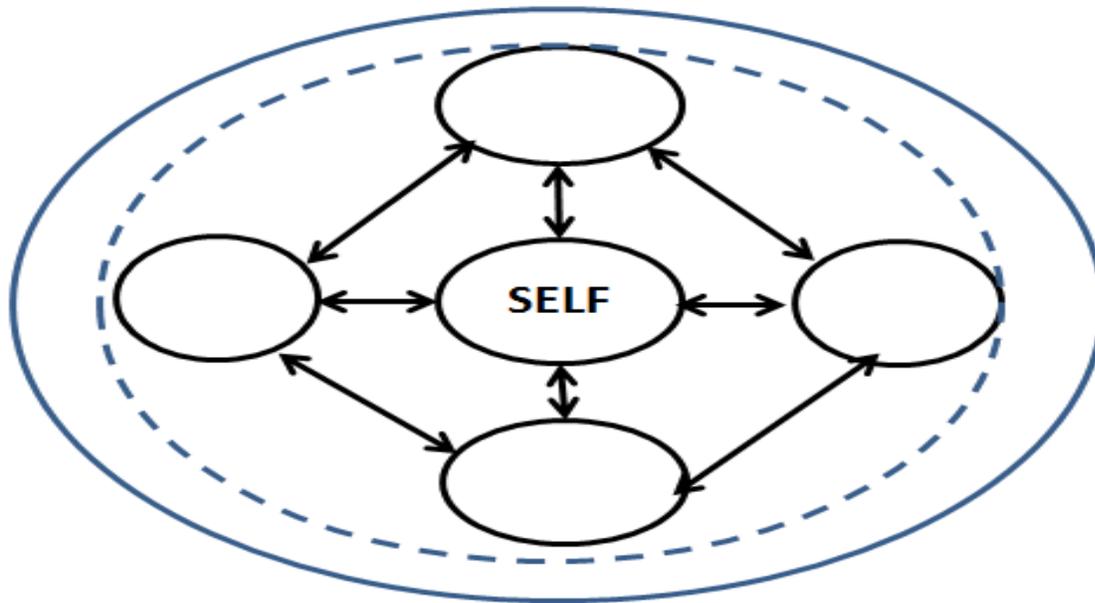


Figure 1. Foundational human relationships. Please fill in essential human relationships in the four interconnected ellipses during the discussion time at the ICM session. Adapted from Corbett and Fikkert (2012, p. 54).

The illustration shows essential or foundational relationships necessary for everything to function well. When these relationships are properly aligned, balanced, and at full strength, cultural, political, and economic, and other human and earthly systems thrive. When one or more sets of relationships are impaired, the human system as a whole suffers. With this in mind, Corbett and Fikkert (2012, again citing Myers) suggested that, “Poverty is the result of relationships that do not work, that are not just, that are not for life, that are not harmonious or enjoyable. Poverty is the absence of shalom in all of its meanings.”

Before we go on, I must clarify that the materially poor, although sharing common issues with broken relationships of one type or another, suffer enormously in their struggle simply for survival; they struggle far more than those of us more blessed at least with material goods.

Poverty results from broken relationships. We have something in common with our Haitian friends. In some senses we too are poor.

The right wrench plus penetrating oil – a parable

Dad and Mom always encouraged me to the use of the right tools – utensils - for the right job. Working on farm machinery brought this clearly into focus. The biggest hex nut on the combine that needed loosened was often encased in concrete-like paint or worse yet, creeping reddish colored rust. First we would douse it with penetrating oil – making it even more slippery and providing a distinctive but pleasant – at least to me - odor to my hands and clothes. If there were several nuts of different sizes to loosen, it was tempting to carry a crescent wrench or if it was really locked tight, vise grips, or a pipe wrench. Carrying a pipe of a large enough diameter to slip over the wrench handle provided even more leverage – don’t do this! Of course the downside of all of these poor practices was not only skinned knuckles but also the corners of the nuts were easily rounded off with these multipurpose tools and methods.

Of course if we severely damaged the nuts in our vain attempts to loosen them, Dad would roll out the cutting torch – he was patient but usually not too happy in those situations. With the torch’s use came the necessity to replace the entire bolt and nut, the likely need to repaint the scorched metal around the nut, and of course the possibility of doing damage to some nearby equally precious belt, sheet metal, or other mechanical part. The wrong tool was notoriously rough on the fragile corners of hex nuts and on bodies – I have a scar to prove it – and had long-term effects!

Agronomic tools: Great 'wrenches' used improperly

Misuse of agronomic tools results in problems too. For example, early-on corn root worm larvae (RW) were well managed with in-furrow insecticides and/or crop rotation. Insect resistance developed. Transgenic Bt corn hybrids released in the late 1990's managed RW for several years; then resistance developed. Dr. Aaron Gassmann reports – and as you probably know - we must now rotate crops and management tactics to effectively manage Bt resistant corn rootworms (Gassmann and Weber, 2012).

Resistance doesn't stop with insects. Iowa weeds developed not only resistance to Group 2 herbicides (ALS inhibitors) but also Group 9 herbicides (Glyphosate). Waterhemp was effectively controlled by Group 2 herbicides until resistance developed in the mid-1990's - about ten years after these herbicides were introduced (Hartzler, 2013). Surveys show that over 90 percent of Iowa's waterhemp populations now resist Group 2 herbicides!

Perhaps 20 percent of Iowa fields have glyphosate resistant waterhemp populations; glyphosate resistance increases rapidly. Dr. Bob Hartzler writes, "Current weed management programs rely almost entirely on herbicides. This reliance places us in a position where resistance to many herbicide groups could spread rapidly across the region... steps must be made to diversify the types of herbicides used, incorporate other management tactics ... and use cultural practices that enhance the competitiveness of the crop," (Hartzler, 2013).

Hartzler - in a recent email - filled in more of the story, "...although the companies have continued to introduce new herbicide active ingredients (the latest being pyroxasulfone - Zidua), the last new site of action was discovered in the 1980's. In many instances, when a weed develops resistance to a herbicide the resistance mechanism is to all herbicides with that site of action. [We are] losing herbicides for resistant prone weeds such as waterhemp and horseweed much faster than they are being replaced." Valuable herbicide tools are disappearing!

And that is not all! Many agronomists encourage the use of fungicides in the absence of any symptoms of disease with Madison-Avenue-like marketing programs. They advocate fungicides for plant health while ignoring pathogen tolerance and/or resistance. Indeed, fungicides provide an extremely useful and effective tool when used as a fungicide. According to Drs. Daren Mueller and Alison Robertson, "The greatest responses to foliar fungicides... have been when disease could impact yield of corn or soybean," (Mueller and Robertson, 2012). They also caution us about spraying without scouting as well as resistance. "Resistance to the strobilurin fungicides... the fungus that causes frogeye leaf spot was reported in Tennessee, Kentucky and Illinois in 2010. [Strobilurin fungicides include: Headline, Quadris, one of two active ingredients in Stratego YLD and Quilt]. Resistant strains of the fungus were again found in 2011 in the same states and also Missouri. Reduced sensitivity to strobilurin fungicides is reported for more than 30 pathogens and is often detected within a few years of the product being used on a crop." We are on the verge of losing yet another good set of tools.

Use the right tools – at the right time

Have we forgotten the basic tenets of Integrated Pest Management? A few years ago an Iowa farmer who planted glyphosate-resistant soybean varieties and rotated them with glyphosate-resistant corn hybrids was asked about the inevitable onset of weed resistance with this approach. He replied, "When that happens, they will have something for me." It has since happened. Have 'they' something new to offer? Unfortunately, as mentioned above, there are few new active ingredients in the herbicide pipeline.

We must think longer range than this not only in terms of herbicides but also in regards to insect and disease management tools as well. If we don't, we will lose many effective tools. Let's not only use the right tools for the job, but let's also use the right tools at the right time. Let's be good stewards of our precious tools. The wrong tools - or for that matter, good tools used at the wrong time - damage our fragile world. Regrettably, there is no 'cutting torch' for these problems.

Unfortunately, we not only abuse some of our best tools, but in many ways we abuse the resources we are blessed with too. Need I mention erosion and degradation of our soil resources? What about water? We must change our thinking relative to our use of tools and resources. We must think more like trusted stewards rather than domineering wardens. It looks like we have a fundamental problem: we are 'poor' in our relationships (Figure 1).

Question 1: We can now address my earlier comment that Iowa agriculture is 'poor' in at least some of the relationships discussed relative to figure 1. Which relationship(s) come(s) to mind? Be prepared to discuss this during the session.

Question 2: Are we treating our agricultural tools and resources with respect? If not, why not? Be prepared to discuss this in the ICM session.

A need for development in Iowa agriculture?

I've 'grown up' professionally categorizing countries subjectively as 'developed,' or less-developed among other categories. Of course –since this is home - I've always thought of the U.S. as developed. Compared to many other countries I've either lived in or visited, we are relatively well-off on a material riches scale. But, I contend that agriculture in the U.S. and Iowa have a ways to go to be 'developed.' I've pointed some of those out in the discussion above.

In general, I don't think we don't respect our tools and natural resources. This lack of respect has roots in dysfunctions with one or more of the relationships we discussed above. I say this knowing that some of you do highly respect our tools and resources; but unfortunately, not all of your neighbors, competitors, and/or colleagues hold the same values.

To understand development and what I think is our need for it, let's think about how human societies respond to disasters. For example, the January 2010 Haitian earthquake - highlighted early in this session in the video - resulted in a major crisis – Point 1 in figure 2. Immediate relief efforts from countries around the world clearly helped prevent even more loss of life. Relief efforts were necessary - and humane - following the crisis in order to stop the bleeding, to stop the free-fall. Rehabilitation needs to begin once the bleeding stops (Point 2, Figure 2). This process attempts to "...restore people and communities to the positive elements of their pre-crisis conditions" (Corbett and Fikkert, 2012). I am not certain if this phase is completed as yet in Haiti. The next phase, Development, is the "...process of ongoing change that moves all the people involved – both the 'helpers' and 'helped,'" – to right relationships (Corbett and Fikkert, 2012) (Point 3, Figure 1). This is a process of the helpers working alongside the helped; true development is not done for people, or for people, but rather alongside and with people.

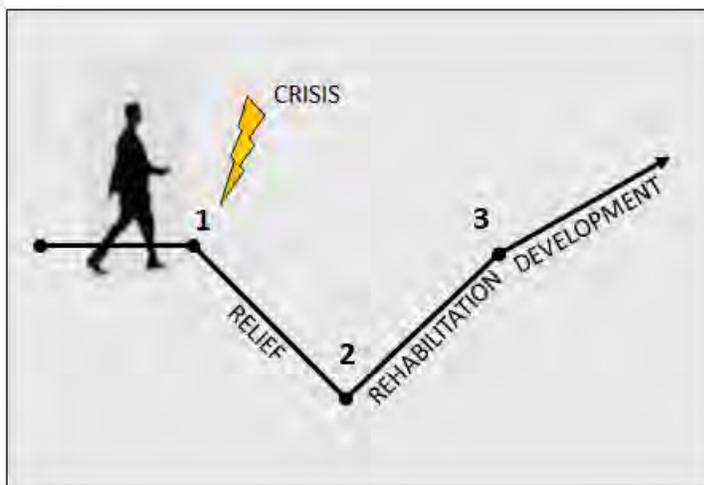


Figure 2. Phases of disaster recovery and development. Adapted from figure 4.1, Corbett and Fikkert, 2012.

Summary

From my perspective, even though Iowa has a relatively well-developed agriculture, we exhibit distinct signs of poverty in at least one or more of the foundational relationships illustrated in figure 1. In general we show disrespect for our tools and natural resources: e.g. transgenic traits, insecticides, herbicides, fungicides, soil, and water. In view of Iowa agriculture, we are in need of relief in a few situations, rehabilitation in other situations, and development in most situations.

Question 3. It is easy – and normal - to ask what are the needs of the ‘poor.’ It is actually more helpful to look at the assets the ‘poor’ bring to the table. Accepting - at least for now - my hypothesis that Iowa agriculture is ‘poor,’ what assets (natural resources etc.) does Iowa agriculture bring to the table?

Question 4. Where do we go from here? What relationships need work? How do we go about it? What can you do differently when serving your clients that brings Iowa agriculture closer to a truly ‘developed’ status?

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