

## A Farmer Looks at Energy Efficiency

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This morning I am going to be sharing farm philosophy with strangers here in Iowa. Back home, at the coffee shop, such thoughts are kept to myself because farmers personalize comments directed at agricultural practices. If you were to suggest that farms might be more energy efficient, farmer Jones will ask, with an edge in his voice, “What did you say about my sister?”

A conference on farm energy utilization would be considered frivolous. We have taken cheap energy to be a given, a birthright if you will.

Can we farm with less energy and maintain satisfactory agricultural production? Absolutely! Farm energy efficiency and conservation are mostly limited by our failures in imagination.

How do I dare make such a statement? A glance at an outline of our operation and philosophy should give you some hints as to how we can make dramatic changes in farm energy equations.

My wife Kathy and I sharecrop about 2,500 acres in central Kansas. About one-half of our land is in wheat and the remainder is in grain sorghum (or milo) and soybeans.

The farm operations in our area can be classified as either conventional—that is, all crops are grown in a tillage system—or the farm is no-till.

In our own operation, we are using a combination or blend of both systems. This seems to be a reasonable course of action, because each system has its own unique pros and cons.

We have a line of conventional equipment, but we are not conventional farmers. Our only planting equipment is a no-till drill, but we can’t be considered a no-till farm. Perhaps you should label us as minimum till. Our current minimum till stands in sharp contrast to previous farm practice. Our first steps in this direction came by accident.

In 1983, in a moment of innocent curiosity, I purchased a prototype no-till drill from the Great Plains Corporation. Dutch, an older traditional farmer and long-time friend, was at the farm when the drill was delivered. We shared chuckles over the folly of my purchase. How could you possibly grow any crop without deep tillage followed by

multiple field operations? It seemed no-till would be impractical and of no serious consequence.

Dutch and I were not the only ones who thought so. In 1987, Great Plains, hoping to build interest in the concept, offered to donate a no-till drill to Iowa State. The drill was not accepted. The college could not see no-till becoming a serious part of farm methodology. Two idiots had company.

However, the drill was sitting there at the farm. We began to experiment with it. Slowly, ever so slowly, we blindly stumbled into painfully simple discoveries that turned our traditional ideas upside down. Learning was difficult because our farm vision was severely limited by our farm culture.

What were some of these discoveries and the new farm strategies they fostered?

1. We were amazed to find that no-till will work in Kansas. In 2002, our best wheat was planted no-till into milo stubs. No herbicide was used and labor and fuel costs were embarrassingly low.

Great things can come with the no-till program. Most importantly, it nearly eliminates soil erosion. Our fragile lands, if not protected by plants and residue, lie naked before the wind and rain. The beauty in no-till is the plant cover that it leaves in place thru the year.

No-till protects our soils and is profitable. We need more no-till. If this is true, you may ask, why isn't your farm 100 percent no-till?

The answer can be found in the same thing that makes no-till succeed: herbicides.

It's exciting to use no-till when herbicides are not required. There are such situations. Wheat planted into milo stubble or soybean stubble would be examples. Unfortunately, in most no-till operations herbicides replace tillage in attempts to achieve weed control. Gallons and gallons of this disgusting stuff are used by both conventional and no-till farmers. This enthusiastic use of pesticides is leading to a rapidly building farm dilemma. Unwanted pests are developing chemical resistance. Where will farmers be when weed I.Q. is higher than that of the chemical applicator? Also, there is growing evidence that farm chemicals pose a serious threat to public health.

2. When no-till demands herbicide, we favor a minimum-till program. Minimum till is not conventional till. Conventional, high horsepower tillage exposes farms to devastating soil losses and is a waste of time and resources. No-till success proves frequent, aggressive tillage unnecessary.

We can maintain competitive yields, improve soil structure, reduce pesticide use, and protect the land and wildlife with less tillage.

How can that be?

Part of the answer lies with the development of modern farm machinery. If you attended state fairs or farm expos over the years, you noticed that farm implements like the disc have been growing in weight and size. A new disc is designed for serious tillage.

But here is the fun part. This new machinery with hydraulic depth control can be adjusted to do successful conventional or minimum till in heavy or light residue. Unlike the older lightweight disc that tends to float over hard ground or plugs in heavy residues, the new tool can consistently till six inches deep or kill and chop weeds and scarcely break the soil crust. Minimum tillage becomes a feasible option. Utilizing modern machinery and reduced tillage has important implications.

1. Shallow tillage leaves crop residues at or near the soil surface. This surface residue dramatically reduces soil erosion. Reducing erosion equals less dust on your coffee table and less silt in your favorite reservoir. What are the energy savings when clean air improves public health and clean water extends the life of that reservoir?

Forty years ago, my father and I believed in deep tillage. Set that old plow as deep as possible, and then, like mad beavers, spend the rest of the summer frantically trying to undo what we had just done. A firm seedbed had to be recreated in that loose plowed ground. All that tillage activity meant that the fuel truck paid regular visits to the farm.

2. In one tillage operation more field preparation can be accomplished than could be done in three or four trips 40 years ago. Tillage trips can be eliminated. On some of our semi-conventional wheat fields we have cut tillage trips in half.

3. Fewer tillage trips create a delayed tillage option. Farm time lines are less critical when total seasonal tillage time is reduced. Relax and go fishing; that wheat stubble can wait until next week. Milo and corn stalks can stand and meet the winter snows. Everyone wins: Farmer Jones, wildlife, and the environment.

4. Reduced tillage means lower fuel costs. In 2002, our fuel expense was less than that of the average Kansas farm. More than \$2.00 an acre less. About two gallons of diesel less. Multiply those gallons by approximately 20 million Kansas acres in our four major crops and consider the effect.

5. Reduced tillage lowers herbicide costs because farm fields are left in a rough condition. Such fields can act as a form of herbicide. Weeds love ground with nice, smooth, even textures. Do weeds follow your rotor tiller in the garden?

It doesn't matter how deep you till, weeds love that pulverized soil. In chaotic field conditions, weed seed is put to the test. It's tough to germinate under loose clods and trash.

When planting with no-till equipment, dirt clumps and crop debris can be pushed aside and the seed dropped into a micro climate that encourages germination. It doesn't matter what the total field looks like. The milo seed, secure in its small bed, could care less. Therefore, we are not compelled to spend countless machine hours under a cloud of diesel smoke making the entire field a seed bed.

6. We found that crop rotation is extremely important. Each crop attracts disease, insects, and plant competitors that have similar life cycles. When switching to a different crop with a different life cycle, the pests affecting the previous crop can be controlled. In so doing, pesticide use can be sharply reduced.

Incidentally, when we started to experiment with crop rotation in the 1980s, this important farm practice went against government policy. Farmers suffered the loss of subsidy payments when they rotated crops.

7. Narrow crop rows are vital to our success. In narrow rows, with more even plant spacing, once the crop makes a canopy, it will do a good job of suppressing weeds on its own. Consequently, we often use a double crop as a form of weed control on what would normally be idle land. That crop canopy is invaluable. It eliminates herbicides, reduces tillage, hides those baby pheasants, and softens the smashing impact of Kansas raindrops.

I have been talking, in general terms, about farm tactics that can curtail the use of pesticides. Let's get specific and look at our grain sorghum fields in 2005. The latest data I have indicates that farmers in Central Kansas spent \$21 an acre on chemicals in 2003.

In 2005, we had 680 acres of milo. Six hundred of those acres were never cultivated and had no pesticide application. Six hundred multiplied by \$21 equals a savings of \$12,600. We purchased a new pickup one year with the money saved on all crop herbicides for that year. We named the pickup Herb.

So, no-till and minimum till can be positive forces in conservation. Government should support such practices. Unfortunately, the major farm subsidy programs have the opposite effect. These programs are single-minded in their devotion to tie subsidy payments to farm production. Perhaps this sounds sensible, but the results are disastrous. Excessive applications of chemicals and fertilizers naturally follow when the farmer farms the program.

Farmer Jones plays crop lottery: double up on fertilizer tickets, pray for extra rain, and wait to hit the crop jackpot covered with subsidy dollars. What do the taxpayers get for their subsidy dollar? Artificially cheap farm products in the grocery store, fewer farms, falling water tables, nitrates in the drinking glass, and a dead zone in the Gulf of

Mexico. These frenzied maximum input, maximum production farm models, endorsed by the universities, the large ag corporations, and government are insanity. The taxpayer and the country deserve much more from their subsidy dollars.

Some of this money chasing crop production must be used to stimulate resource conservation. Effective government programs that encourage conservation need be, and can be, simple.

We already know what our farmers spend on inputs. Target those inputs and create a resource award program.

Target fuel. Melander, your itemized IRS statement shows you used \$2.00 an acre less than the average farm or our fuel standard for this year. So, we will pay \$2.00 an acre multiplied by your crop acres. Fertilizers and pesticides would be additional mandatory targets.

We need to create government policies that, at the very least, cause Farmer Jones to ponder the probability that he might collect more subsidy dollars by using sound environmental tactics that reduce input costs.

These policies would radically alter the thinking of everyone in agriculture.

Picture Farmer Jones celebrating good yields and generous subsidies because he grew a nitrogen fixing cover crop and was frugal with pesticides and fertilizer.

Imagine a news article describing a new milo variety from Kansas State that does more to shade the ground and thus reduces herbicide use.

Imagine crop varieties selected on their ability to perform with limited fertilizer.

Such policies would excite creativity on the farm and do more to promote environmental issues and energy conservation than pages of detailed regulation and red tape. With American farm ingenuity running wild in a new direction, there would be an explosion in responsible farm strategies.