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WOULD FUEL PRICES BE AS HIGH IF MORE FARMERS USED NO-TILL?

LINCOLN, April 25, 2008 - The current energy crunch and the resulting ripple effects throughout our urban and rural economies should encourage all us farmers to take another look at the benefits of using continuous no-till systems. Continuous no-till systems require less of your time, labor, fuel, and machinery hours than conventional tillage systems.

The amount of diesel fuel burned in your operation is a direct indicator of how much time you are spending in a tractor in the field. The hour meter on your tractor can reflect up to a \$1,000 per day cost to do tillage.

We can break that down into actual machinery cost using horsepower hour charges, fuel, and labor costs using a 200 horsepower tractor.

Tractor Costs

Long term tractor rental rates run from 15 to 17 cents per horsepower hour per hour. A 200 horsepower tractor would cost \$30 to \$34 dollars per hour to just be in the field doing anything.

That 200 horsepower diesel engine under full load pulling a tillage implement will burn up to 10 – 12 gallons of fuel per hour. At a projected spring cost of \$3.25 per gallon that computes to fuel costs of \$32.50 to \$39.00 per hour. The cost of an operator to drive the tractor will be around \$10 an hour.

For each meter hour add \$32 for the tractor, \$36 for diesel fuel, and \$10 for the operator for a total cost of \$78.00 per hour. That adds up to \$1,092 for a 14-hour day in the field doing tillage that some farmers are choosing not to do, and getting along very well without it.

Conventional Tillage vs. No-Till

Let's take a look at the costs for 160 acres of cornstalks being planted to soybeans using continuous no-till versus conventional tillage. We'll use a 30 foot wide disk, a 45 foot field cultivator and a 90 foot wide sprayer boom for comparison purposes, all being pulled by that same 200 horsepower tractor.

Tillage on 160 acres of cornstalks disking at 5 miles per hour with a 30 foot wide disk will require 8.8 hours covering 18 acres per hour. The tractor is pulling under maximum load so the charge is \$78 per hour. The per acre cost is \$4.29 per acre.

That primary tillage pass will require a secondary tillage pass with a field cultivator to smooth the soil surface and prepare the seedbed. Pulling a 45 foot wide field cultivator at 5 miles per hour will require 5.9 hours covering 27 acres per hour. The tractor is pulling under maximum load so the charge is \$78 per hour. The per acre cost is \$2.88, making the total cost for two trips for seedbed preparation \$7.17 per acre.

A primary tillage pass made with a 15 foot disk chisel/ripper at 4 miles per hour will require 22 hours covering 7.3 acres per hour. Again the tractor is pulling under maximum load so the charge is \$78 per hour. The cost per acre is \$10.73, upping the total cost of the three trips for seedbed preparation to \$17.90 per acre.

We will use current costs for herbicides purchased for the no-till comparison. To burn down the field with 16 ounces of a generic glyphosate the cost would be \$4.50 for product using \$36 per gallon for cost. Adding a half pint of 2,4-D LV6 for glyphosate-resistant winter annuals would cost \$1.20 using \$19 per gallon for cost. Total herbicide cost is \$5.70 per acre.

Spraying a burndown herbicide on 160 acres with a 90 foot boom traveling at 8 miles per hour will require 1.8 hours covering 88 acres per hour. The tractor under ¾ load would burn about 8 gallons per hour for a cost of \$0.29 per acre.

Using the continuous no-till system the tractor cost is \$0.36 per acre and the labor cost on 160 acres for 1.8 hours is \$0.12 per acre. Total cost per acre for chemical application is \$0.77. Total cost for seedbed preparation is \$6.47.

The total cost for burndown is \$6.47 per acre, and you have it done in less than two hours. You will have many extra hours left in the day to burndown more fields or plant a previously burned down field.

Table 1: Cost and Time of Seedbed Prep on 160 Acres Using Conventional Tillage and No-Till. A savings of 70 cents per acre and using a fifth of the time that a conventional system uses seems like a good business move.

	Conventional Tillage (3 trips)	Conventional Tillage (2 trips)	No-Till
Disking	\$4.29	\$4.29	\$0.00
Cultivator	\$2.88	\$2.88	\$0.00
Deep Ripper	\$10.73	\$0.00	\$0.00
Glyphosate	\$0.00	\$0.00	\$4.50
2,4-D	\$0.00	\$0.00	\$1.20
Chemical Application	\$0.00	\$0.00	\$0.77
Total Cost/Acre	\$17.90	\$7.17	\$6.47
Hours	37	15	2

Fuel Savings

Using an average 11 gallons of diesel fuel burned per hour, we'll look at the total cost in diesel fuel burned on 160 acres of cornstalks for the three approaches to seed bed preparation.

A three tillage trip program uses 404 gallons of fuel for seedbed preparation on 160 acres, a total fuel cost of \$1,313.

A two tillage trip program uses 162 gallons of fuel on the same 160 acres, a total fuel cost of \$526.50.

The continuous no-till program uses 20 gallons of fuel on the same amount of acres, a total fuel cost of \$65. This is about a twentieth of the cost of the three trip tillage program and an eighth of the cost of the two trip tillage program.

Table 2: Savings of Fuel Costs for Seedbed Prep on 160 Acres Conventional Tillage vs. No-Till Systems.

	Conventional Tillage (3 trips)	Conventional Tillage (2 trips)	No-Till
Gallons	404	162	20
Cost	\$1,313.00	\$526.50	\$65.00
Savings	\$0.00	\$786.50	\$1,248.00

The 2006 Crop Residue Management survey in the Lower Elkhorn Natural Resources District (LENRD), which encompasses five counties in northeast Nebraska, showed that 48% of the soybeans planted into cornstalks were in a continuous no-till system. Let's use the LENRD as an example.

In the LENRD, 40% of the soybeans were planted into cornstalks using a mulch till or two pass system, and about 12% were planted using the three pass tillage system.

On the 1,137,500 acres of cornstalks in the survey, of which 52% was the two pass tillage program, you could expect to save over 525,000 gallons of fuel in seedbed preparation costs alone by switching these acres to continuous no-till systems.

Given that 12% of those acres were a three pass system using 400 gallons per 160 acres it is likely that over 600,000 gallons of diesel fuel could be conserved annually by transitioning those acres to continuous no-till.

Table 3: Total Cost of Fuel and Seedbed Preparation on 160 Acres

	Conventional Tillage (3 trips through field)	Conventional Tillage (2 trips through field)	No-till
Total Costs	\$2,864	\$1,147.20	\$1,035.20

If you look at the pump price of diesel fuel and gas now, the high price is explained by some by the demand for the product. If farmers could put over 600,000 gallons of fuel back into the supply side by not using it, in just the Lower Elkhorn NRD, would it impact the price of petroleum at the pump? It certainly couldn't hurt.

This is just a look at the fuel usage alone. If you add in the fact that continuous no-till increases rainfall infiltration that tremendously reduces runoff and soil erosion you definitely have a package that is worth reviewing.

Whether you are currently farming or a landlord renting your land out, the concept of energy conservation through transitioning to continuous no-till systems on our farmland has the potential to positively affect all of us, urban and rural.