2014 Projected Custom Rates for Kansas

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Introduction

COSTS ASSOCIATED WITH OWNING AND OPERATING FARM MACHINERY IS A MAJOR expense for most farming operations. Rather than owning all the required equipment, some farm operations rely on hiring others to perform certain field operations (e.g., custom harvesters, chemical applications). Likewise, some producers perform custom work for others as a means of spreading the fixed costs associated with machinery ownership over more acres, thus reducing their per acre costs. Because of this, information regarding custom rates for various field operations is of interest to both those hiring work done as well as those doing custom work. Another use of custom rates information is to allocate whole-farm costs to specific enterprises and to benchmark machinery costs. For example, see *Custom Rates and the Total Cost to Own and Operate Farm Machinery in Kansas, MF-2583* (Beaton, Dhuyvetter, and Kastens) and the associated decision tool (*KSU-MachCost*) available on www.AgManager.info for a discussion of evaluating and benchmarking farm machinery costs.

Historically, the Kansas Department of Agriculture Statistics Division (Kansas Ag Statistics, or KAS for short) in cooperation with the National Agricultural Statistics Service published a *Custom Rates* book based on annual surveys of farmers and ranchers, custom operators, co-ops, and elevators.[1] Similarly, the Land Grant Universities of the states surrounding Kansas also publish custom rates based on surveys that are done either annually, or in some cases, every other year. Table 1 lists the most current information that is available for Kansas and the surrounding states.

Due to budget reductions at KAS, the annual survey was discontinued in 2010, however, a survey was sent out again in the fall of 2013 (likely to be done on an every other year basis going forward). Kansas producers looking to hire custom operators, custom operators themselves, and farm managers that use the information in the KAS *Custom Rates* publication need to come up with estimates of future custom rates in order to make decisions for the upcoming year. While custom operators that know their actual costs of production should be in a good position to determine what appropriate rates should be for the coming year, producers often like to see values from a third party as well. One possibility is to rely on information from neighboring states, assuming this information will continue to be available in the future. However, producers, custom operators, lenders, and others who have used the Kansas *Custom Rates* publication in the past, likely would prefer to have future custom rates information that is consistent with what they have used

[1] *The Custom Rates booklet was published in hard copy format from approximately the early 1970's up until 2001(no report was available in 1986 due to budget reductions). Starting in 2002 the publication was published in electronic format (pdf file) only. Custom rates reports for the years 2001 through 2009 and 2013 are available online at www.nass.usda.gov/Statistics_by_State/Kansas/Publications/Custom_Rates/index.asp.*

historically. Thus, the purpose of this paper is to provide projections of many of the custom rates previously published by KAS for Kansas that are believed to be reasonable for the year 2014. In addition, because the data reported by KAS are for averages, that may or may not be appropriate for individual situations, model-estimated values for 2013 and 2012 are also reported allowing users to examine year-to-year changes both in absolute and percentage terms.

Table 1. Custom Rate Information Available in Kansas and Surrounding States

State	Publication name and web link*	Source
KS	Custom Rates 2013	Kansas Ag Statistics
	www.nass.usda.gov/Statistics_by_State/Kansas/Publications/Custom_Rates/custom13.pdf	
CO	Custom Rates for Colorado Farms & Ranches in 2012	Colorado State University
	http://www.ext.colostate.edu/sam/2012-custom-rates.pdf	
IA	2013 Iowa Farm Custom Rate Survey (A3-10)	Iowa State University
	www.extension.iastate.edu/publications/fm1698.pdf	
NE	2012 Nebraska Farm Custom Rates -- Part I (EC823)	University of Nebraska
	http://www.ianrpubs.unl.edu/epublic/pages/index.jsp?what=publicationD&publicationId=1013	
	2012 Nebraska Farm Custom Rates -- Part II (EC823)	University of Nebraska
	http://www.ianrpubs.unl.edu/epublic/pages/index.jsp?what=publicationD&publicationId=1014	
MO	2012 Custom Rates for Farm Services in Missouri (G 302)	University of Missouri
	http://extension.missouri.edu/p/G302	
OK	Oklahoma Farm and Ranch Custom Rates, 2011-2012 (CR-205)	Oklahoma State Universit
	http://oces.okstate.edu/kay/ag/CustomRates%202011-2012.pdf	

* All websites listed were accessed on February 1, 2014.

Projecting Machinery Costs

In the absence of having actual production costs for specific field operations, there are basically two approaches to projecting costs. The first approach is to use an engineering approach where the relevant machinery complement (e.g., tractor and planter, sprayer, etc.) is identified and then all the relevant costs (i.e., depreciation, interest, repairs, fuel, labor, and TIS (taxes, insurance and shelter)) are estimated using economic and engineering formulas. A downside to this approach is that it requires many assumptions regarding intensity of use, purchase price, useful life, etc. Lazarus published a paper in June of 2013 of machinery cost estimates for many of the typical field operations in Minnesota using an economic engineering approach (http://faculty.apec.umn.edu/wlazarus/documents/machdata.pdf). While there is a lot of good information in this publication (i.e., the costs to own and operate many different types of machinery), the usefulness of this information to Kansas producers is somewhat limited due to varying soil types, field size, available field days, machinery sizes, etc. relative to what are common in Minnesota. Thus, this published information would either need to be adjusted to reflect Kansas conditions or re-estimated using assumptions and machinery complements appropriate for typical Kansas farms.

A second approach to projecting future custom rates is to use historical data to develop models that can be used for predicting future values. Average custom rates for various farming operations in Kansas from 1990 to 2009, as reported by KAS, are shown in Figures 1 and 2. It can be seen that custom rates generally increase over time and have been fairly consistent with inflation rates. The one notable exception to the annual growth rates is the large increases that were observed in several of the rates in 2008, which was associated with record high diesel fuel prices that year.

Figure 1.

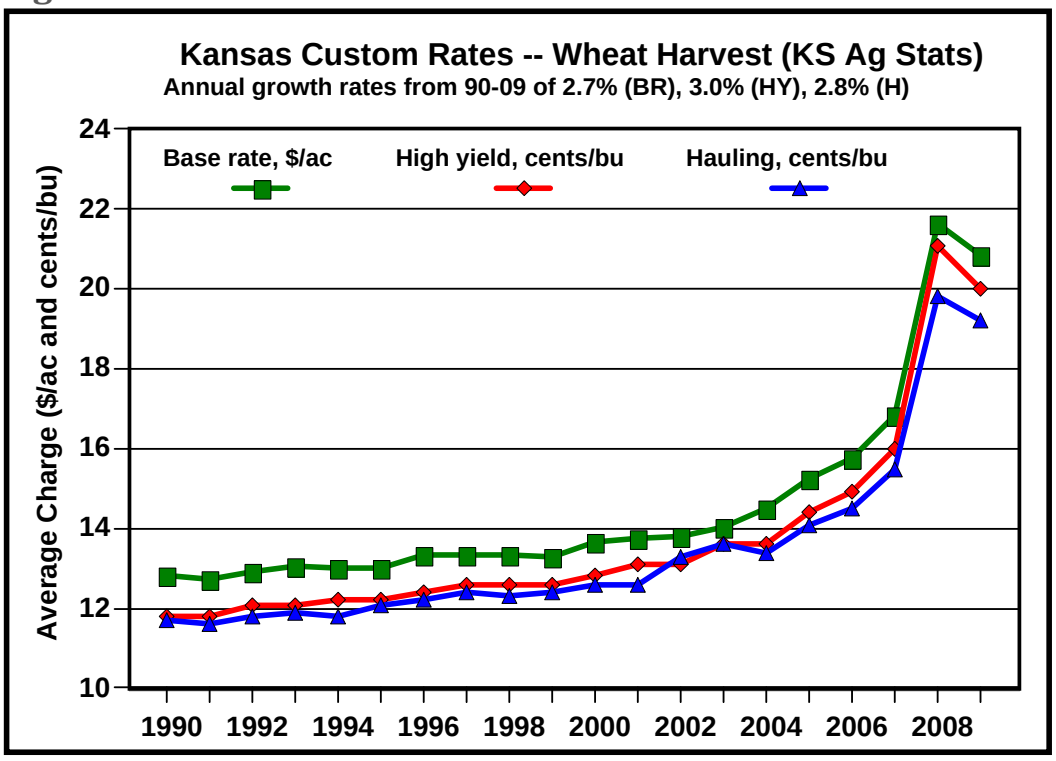
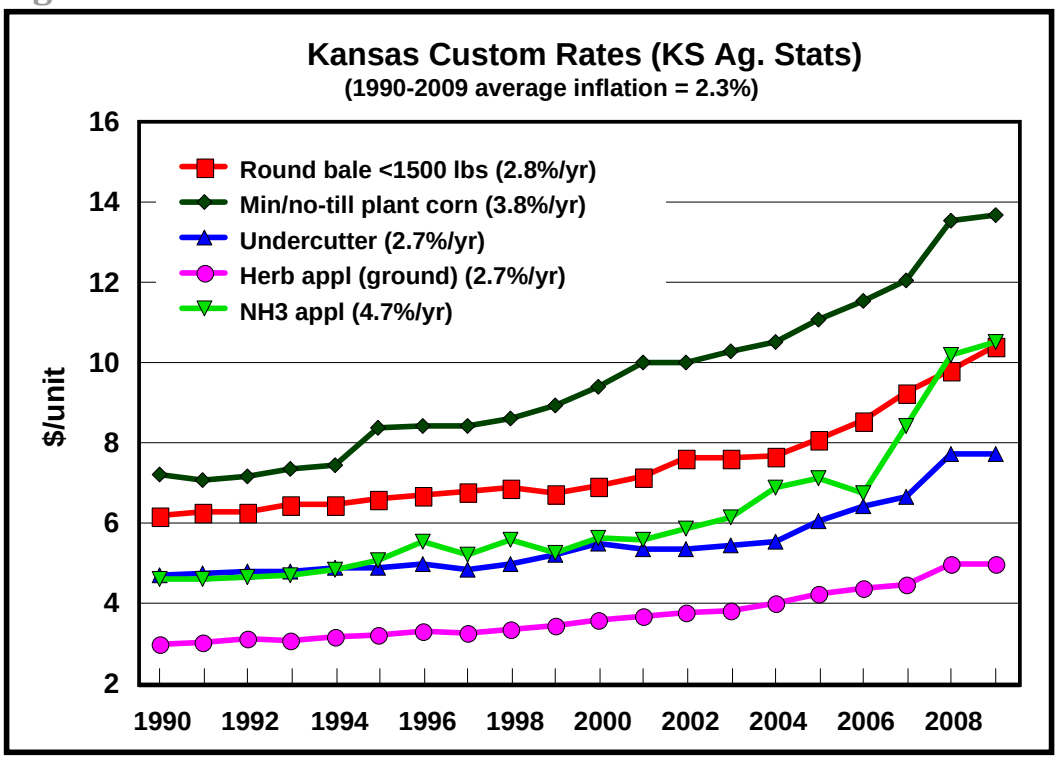


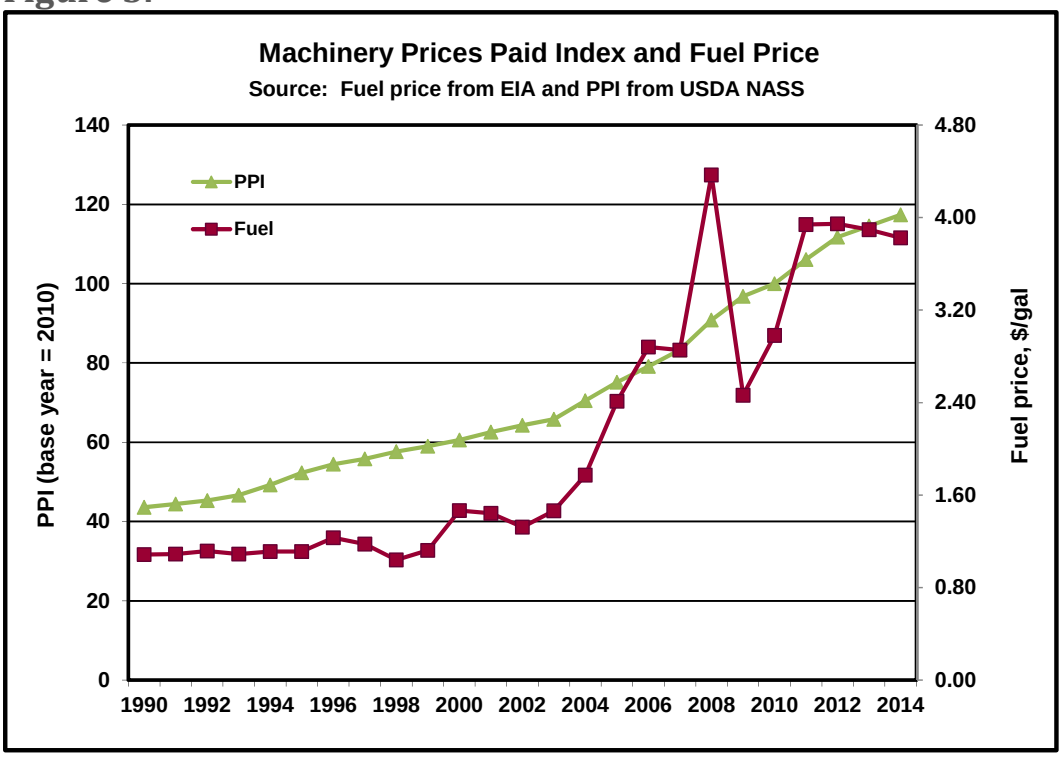
Figure 2.



Based on the data displayed in Figures 1 and 2, it seems logical that custom rates might be estimated as a function of an inflation index as well as fuel prices. Figure 3 shows historical data for taxable diesel fuel and the machinery producer paid index (PPI) along with projections for 2014.

The projected price for diesel fuel in 2014 (as of January 31, 2014) is $3.83 per gallon (this is taxable fuel, non-taxable fuel is approximately $0.47/gallon less), which is a slight decrease from the 2013 price of $3.90, but a significant increase from 2009 and 2010 prices ($2.46 and $2.98/gallon, respectively). Visually comparing the custom rates in Figures 1 and 2 with the patterns in Figure 3 (keeping in mind that custom rate data on exist only for the years of 1990-2009 and 2013), it appears that these two variables, i.e., PPI and fuel, when combined likely would explain changes in custom rates over time reasonably well.

Figure 3.



While it is likely the case that the many different custom rates that are reported would have different models, it was decided to estimate the same model for all custom rates related to costs. Thus, the following model was estimated for all relevant custom rates:

$$CustomRate_{it} = B0_i + B1_i(PPI_t) + B2_i(Fuel_t) + B3_i\text{-}B10_i(Region),$$

where *CustomRate* refers to the natural log of the historical custom rates published by KAS (rates are always in dollars, but the units vary, e.g., acres, bale, ton, bushel, mile), *PPI* is an index for producer paid prices for machinery as reported by USDA NASS, *Fuel* is the U.S. average diesel fuel price (including taxes) for the months of April through September, *Region* is a series of binary variables to account for the different Crop Reporting Districts in the state, *i* is an index for the different custom rate operations, *t* is an index for year (data from 1990-2009 and 2013 were analyzed), and B's are parameters to estimate.[2] Several custom rates also include physical

[2] *State- and Region-level custom rate data from Kansas Agricultural Statistics Custom Rates publications for the relevant years were analyzed. Models were estimated first with State averages (no region variables) and then separately with Region averages (model included region variables). Missing values were "filled in" using relationships of years when data existed and with similar operations. At the state level there were less than 3% of potential observations filled in. At the region level, depending upon the operation, there were considerably*

components such as bushels, miles, or tons (i.e., harvest yields often have a charge per bushel for yields above some level). In these cases the physical measure was estimated using a linear time trend.

As an indicator of how well the estimated models might work for projecting future values, the R^2 (R-square) statistic, which is an in-sample measure as to the goodness of fit of a model, is reported. This statistic reflects the percentage of the variability in the dependent variable (i.e., custom rate) that is explained by variability in the independent variables (i.e., PPI, fuel, and region (if applicable)). R^2 is bounded by 0 and 1 (or 0 and 100 if expressed as a percentage) with higher values indicating a better statistical fit. As a general rule, the estimated models fit the data quite well and the average R^2 across the models was 0.87 for state average models and 0.72 for models estimated with region data. However, there were several models with considerably lower values indicating they may not be as accurate for predicting future values.

Tables 2-8 report various custom rates, as published by KAS, for 2009 and 2013 (last two years of actual data available) and model-projected values for 2012 through 2014. Projected values for PPI were based on year-to-year changes from the last two years of available data. Monthly fuel prices for 2014 are from the U.S. Energy Information Administration (EIA) Short-Term Energy Outlook (STEO) released January 7, 2014. The fuel price used in the models was a simple average across the months of April through September. In addition to the projections for 2014, changes in both absolute terms and percentages from model-estimated 2013 values are reported. These changes might be the most relevant measure if producers are looking at how they might change rates in 2014 relative to what they were in 2013. All values reported in Tables 2-8 are for ***State*** average values. Comparable ***Region*** values (2009 and 2013 actuals and 2012-2014 projections) are available in an Excel spreadsheet (***KSU-CustomRates(Feb2014).xlsx***) that is available at www.AgManager.info. This spreadsheet allows the user to choose a region of the state and enter the diesel price for the year they want a prediction for. That is, these same tables can be printed for individual regions and user-specified fuel prices using the Excel spreadsheet.

Planting Rates (Table 2)

Table 2 includes the custom rates per acre for planting various crops for both regular-till and minimum/no-till. Averge rates for no-till are generally about $2.00/acre higher than regular-till with small grains (i.e., wheat) having a larger difference than spring crops. Changes for 2014, relative to 2013, are for increases of approximately 3.5% ($0.50-$0.60) for regular-till and 3.5% ($0.55-$0.65) for minimum/no-till. The R^2 values indicate that the estimated models fit the historical data very well, which gives us confidence that the forecasts should be reasonable.

Chemical Application Rates (Table 3)

Table 3 includes the custom rates per acre for applying chemicals with different application methods. Increases for 2014 compared to 2013 range from about 2% to 3% ($0.10-$0.20/acre). The projected increases for anhyrous ammonia (NH3) application is the highest at 3.6% ($0.47/acre). The R^2 values were highest for liquid and dry fertilizer applications and ground rig application for herbicides and insecticides, which is not surprising given that these operations generally have had the largest number of responses in the KAS surveys. The models for aerial applications and row crop cultivation (with and without fertilizer) did not fit the historical data

more missing values that were filled in using data from neighboring regions and other years. PPI data are annual averages based on monthly data from the USDA NASS. Diesel fuel prices are from the Energy Information Administration (EIA) available at www.eia.doe.gov/emeu/steo/pub/cf_query/index.cfm.

quite as well. Put another way, there was a little more unexplained variation in the custom rates of these operations, i.e., variability due to factors other than inflation (PPI) and fuel price.

Tillage Rates (Table 4)

Custom rates per acre for the various different tillage operations are reported in Table 4. Percentage increases from 2013 are generally in the 2.0-3.0% range, which equate to $0.20-$0.30/acre for most operations. Most of the models fit the historical data quite well, the exceptions tended to be those operations with the fewest reports and thus rates tend to be more variable from year to year.

Silage Harvesting Rates (Table 5)

Custom rates per ton for silage harvesting and hauling are reported in Table 5. Rates for chopping and hauling or chopping only are projected to be up 1.5-2.0% (about $0.12/ton in both cases) compared to 2013 projected rates. Rates for chopping, hauling & filling silo and hauling only are both basically flat compared to 2013 rates. Based on the R^2 measure, the models for chopping, hauling & filling silo and chopping and hauling only are likely more accurate of actual costs than the chopping only and hauling only projections.

Grain Harvesting Rates (Table 6)

Custom rates for grain and oilseed harvesting and hauling are reported in Table 6. Custom harvest rates tend to have a fixed rate per acre and an extra charge per bushel for yields above some fixed level and a hauling charge per bushel. In almost all cases, projected rates are projected to be up about 1.5-2.0% compared to projected rates in 2013. Models for high yield levels (bu/acre) are projected to be the same as in the past (i.e., no change). Remember the model for this variable was a linear time trend and thus the models are suggesting high yield levels have been quite stable over time (roughly 22 bu for wheat and 36 bu for sorghum). The models for the cost variables fit the historical data quite well (i.e., R^2 values were mostly in the 0.90 to 0.95 range). The R^2 values were very low for the high yield variables for all crops, however, that does not mean the projected values will not be accurate necessarily. Rather, this is indicative of the fact that these yields have been stable over time and thus there has been very little variation that could be explained with a trend variable.

Hay and Forage Rates (Table 7)

Custom rates for the many different operations pertaining to putting up and hauling hay and forage are presented in Table 7 (rotary mowing on both a $/acre and $/hour basis are also included). Of the 20 hay-related models, 14 had R^2 values above 0.90 (considerably higher in some cases) indicating that generally speaking the estimated models fit the historical data quite well. The models that fit the data worst were custom rate for hauling large round bales on a per ton basis, stacking hay, and baling large square bales on a per bale basis. The projected percentage increases for haying operations ranged from a slight decrease to increases of over 5% (rotary mow on a per hour basis is projected to be up 5.7%) depending upon the specific operation.

Feed Preparation and Delivery Rates (Table 8)

Custom rates for the different methods of processing feed as well as several different methods of charging for delivery are reported in Table 8. As a group, the projected increases for these operations are generally in the 2.5-3.0% range. As previously discussed with some of the other custom rates, models with relatively poorer fit (i.e., lower R^2 values) tend to be the result of smaller samples in the historical data and thus more year-to-year variability.

Summary

Custom rates have many uses for different people. Obviously people hiring others for certain farm operations benefit from having information as to what reasonable expectations are. Likewise, custom operators themselves benefit from having information to help them as they negotiate rates with their customers. Producers, lenders, and farm management consultants also use custom rates information as proxies for machinery costs and benchmarking. Historically, Kansas Agricultural Statistics (KAS) has conducted a survey annually regarding custom rates and reported these results. However, due to budget reductions, this survey was discontinued in 2010 and thus a void existed regarding custom rate information in Kansas. Fortunately, the survey was sent out again in the fall of 2013 providing an update. Even with the 2013 data, it is helpful to have projections for the upcoming year, which is what this paper reports. Specifically, this paper reports projected custom rates for many of the categories that have been historically reported by KAS where the projections are based on models incorporating an inflation index (prices paid by producers for machinery) and diesel fuel prices. Of the approximately 90 models estimated, the vast majority of them fit the historical data very well indicating that the projections from these models should be reasonable and provide a good starting point for producers and custom operators to begin their negotiation process. The projected values for 2014 reported here are based on projections of PPI for 2014 as well as monthly diesel prices for April 2014 through September 2014 as of early January 2014.

Users of the information reported in Tables 2-8 are reminded that the projected values are for state averages as opposed to region-specific values. Custom rates will vary regionally due to varying factors (e.g., soil type, field size and shape, distance between fields, traffic) and therefore an estimate of statewide averages will likely be too high in some cases and too low in others. Region-specific forecasts are available in an Excel spreadsheet (***KSU-CustomRates(Feb2014).xls***) available at www.AgManager.info. Whether working with state-level or region-level estimates, it still may be more appropriate to apply projected year-to-year changes (either percent or $/ac) to rates charged in previous years as opposed to using the absolute values reported in Tables 2-8. Additionally, it is important to remember that these forecasts were made at a specific point in time (January 2014 data) and thus are based on expected future inflation and diesel prices at that time. As additional information becomes known, or as projected values for PPI and fuel change, forecasts of the custom rates reported here could also be revised. The Excel spreadsheet listed above (available at www.agmanager.info/Tools/default.asp#MACHINERY) can be used to modify the forecasts provided in Tables 2-8 by changing the fuel price and for specific regions of the state.

References

Beaton, A.J., K.C. Dhuyvetter, and T.L. Kastens. "Custom Rates and the Total Cost to Own and Operate Farm Machinery in Kansas." Kansas State Univ. Coop. Ext. Serv. Bull. MF-2583. April 2003.

Lazarus, W. F. "Machinery Cost Estimates." University of Minnesota Extension Paper. June 2013. Available at http://faculty.apec.umn.edu/wlazarus/documents/machdata.pdf

Table 2. Historical and Projected Custom Rates -- PLANTING ($/acre)

	Actual Average		Projections			2014 versus 2013		
Operation	2009	2013	2012	2013	2014	$/unit chg	% chg	R^2
Regular-Till								
Small grains	$11.14	$13.58	$13.94	$14.42	$14.93	$0.50	3.5%	0.985
Sorghum	$12.61	$14.77	$15.44	$16.00	$16.59	$0.59	3.7%	0.978
Corn	$12.52	$14.71	$15.63	$16.16	$16.73	$0.56	3.5%	0.975
Soybeans	$12.58	$14.53	$15.85	$16.40	$16.96	$0.57	3.5%	0.961
Grass	$14.02	$15.35	$17.21	$17.67	$18.14	$0.47	2.6%	0.932
Alfalfa	$12.68	$15.04	$16.53	$17.06	$17.61	$0.55	3.2%	0.923
Minimum-Till or No-Till								
Small grains	$13.31	$15.52	$16.62	$17.15	$17.70	$0.55	3.2%	0.941
Sorghum	$13.63	$15.40	$16.79	$17.40	$18.05	$0.65	3.7%	0.947
Corn	$13.70	$15.83	$16.88	$17.46	$18.08	$0.62	3.6%	0.960
Soybeans	$13.68	$15.74	$17.14	$17.72	$18.33	$0.61	3.5%	0.930

Table 3. Historical and Projected Custom Rates -- CHEMICAL APPLICATIONS ($/acre)

	Actual Average		Projections			2014 versus 2013		
Operation	2009	2013	2012	2013	2014	$/unit chg	% chg	R^2
Row crop cultivate w/ fertilizer	$8.00	$10.84	$9.82	$10.04	$10.25	$0.22	2.2%	0.882
Row crop cultivate w/o fertilizer	$7.24	$9.39	$9.29	$9.48	$9.68	$0.20	2.1%	0.892
Dry fertilizer application	$4.68	$5.31	$5.68	$5.82	$5.95	$0.14	2.4%	0.958
Liquid fertilizer application	$4.82	$5.71	$5.86	$5.99	$6.12	$0.13	2.2%	0.982
Anhydrous ammonia application	$10.55	$12.60	$12.56	$13.01	$13.49	$0.47	3.6%	0.972
Ground rig herbicide application	$4.98	$5.44	$5.77	$5.89	$6.01	$0.12	2.1%	0.968
Aerial herbicide application	$6.93	$7.60	$7.07	$7.21	$7.36	$0.15	2.0%	0.859
Ground insecticide application	$4.95	$5.45	$5.82	$5.94	$6.06	$0.12	2.1%	0.958
Aerial rig insecticide application	$6.60	$7.73	$7.25	$7.40	$7.56	$0.16	2.1%	0.929

Table 4. Historical and Projected Custom Rates -- TILLAGE ($/acre)

	Actual Average		Projections			2014 versus 2013		
Operation	2009	2013	2012	2013	2014	$/unit chg	% chg	R^2
Disking	$9.06	$11.31	$11.04	$11.32	$11.60	$0.28	2.5%	0.993
One-way disking	$9.06	$11.31	$10.85	$11.07	$11.29	$0.22	2.0%	0.956
Off-set disking	$9.52	$10.98	$11.16	$11.38	$11.60	$0.22	1.9%	0.984
Chisel (4-12")	$10.06	$12.71	$12.57	$12.78	$12.99	$0.21	1.6%	0.987
Deep chisel (over 12")	$13.70	$15.88	$16.52	$16.77	$16.99	$0.22	1.3%	0.961
Spiketooth harrow	$7.30	$8.82	$8.34	$8.55	$8.76	$0.21	2.5%	0.944
Springtooth harrow	$8.40	$8.25	$8.17	$8.42	$8.68	$0.26	3.1%	0.863
Moldboard plow	$14.00	$14.13	$15.03	$15.15	$15.25	$0.10	0.6%	0.857
Wheel springtooth	$7.43	$8.25	$8.63	$8.83	$9.03	$0.20	2.3%	0.907
Shank cultivator	$8.84	$10.40	$10.44	$10.68	$10.93	$0.25	2.3%	0.987
Undercutter (large V-blade)	$7.42	$9.34	$8.79	$8.94	$9.09	$0.14	1.6%	0.986

Table 5. Historical and Projected Custom Rates -- SILAGE HARVESTING ($/ton)

	Actual Average		Projections			2014 versus 2013		
Operation	2009	2013	2012	2013	2014	$/unit chg	% chg	R^2
Chopping, hauling, & filling silo	$7.39	$9.17	$8.61	$8.67	$8.71	$0.04	0.5%	0.945
Chopping & hauling	$6.54	$8.07	$7.68	$7.80	$7.91	$0.11	1.5%	0.992
Chopping only	$4.68	$5.21	$5.99	$6.11	$6.23	$0.12	2.0%	0.710
Hauling only	$2.18	$2.33	$2.58	$2.58	$2.58	$0.00	0.0%	0.681

Table 6. Historical and Projected Custom Rates -- GRAIN HARVESTING

	Actual Average		Projections			2014 versus 2013		
Operation	2009	2013	2012	2013	2014	$/unit chg	% chg	R^2
Wheat								
Base charge, $/acre	$20.86	$23.93	$22.78	$23.09	$23.38	$0.29	1.3%	0.940
Extra charge for yield > high yld, cents/bu	20.0	22.7	22.0	22.3	22.6	0.31	1.4%	0.941
High yield, bu/acre	22.0	23.0	21.9	22.0	22.0			0.288
Hauling charge, cents/bu	19.2	20.2	20.5	20.8	21.0	0.28	1.4%	0.930
Sorghum								
Base charge, $/acre	$22.37	$24.33	$23.50	$23.76	$24.00	$0.24	1.0%	0.905
Extra charge for yield > high yld, cents/bu	20.4	23.0	22.4	22.8	23.1	0.33	1.5%	0.937
High yield, bu/acre	35.0	35.0	35.8	35.8	35.9			0.023
Hauling charge, cents/bu	18.9	20.5	20.5	20.8	21.1	0.28	1.3%	0.938
Corn								
Base charge, $/acre	$26.35	$30.02	$28.53	$28.89	$29.24	$0.35	1.2%	0.952
Extra charge for yield > high yld, cents/bu	19.2	21.7	22.4	23.0	23.6	0.58	2.5%	0.897
High yield, bu/acre	73.0	71.0	73.4	73.9	74.3			0.128
Hauling charge, cents/bu	16.4	18.9	18.7	18.8	19.0	0.14	0.8%	0.939
Flat rate charge, cents/bu	29.0	36.0	34.6	35.0	35.4	0.37	1.1%	0.973
Soybean								
Base charge, $/acre	$25.66	$28.78	$28.07	$28.35	$28.62	$0.27	0.9%	0.968
Extra charge for yield > high yld, cents/bu	19.8	23.2	22.0	22.2	22.4	0.20	0.9%	0.932
High yield, bu/acre	27.0	27.0	27.7	27.9	28.1			0.534
Hauling charge, cents/bu	17.5	18.8	19.0	19.2	19.4	0.20	1.0%	0.924
Sunflowers								
Base charge, $/acre	$26.26	$30.33	$29.05	$29.69	$30.34	$0.65	2.2%	0.943
Extra charge for yield > high yld, cents/cwt	27.4	20.4	30.8	31.4	32.0	0.57	1.8%	0.707
High yield, cwt/acre	19.0	8.9	13.8	14.0	14.2			0.050
Hauling charge, cents/cwt	26.7	35.7	33.6	33.9	34.0	0.16	0.5%	0.800

Table 7. Historical and Projected Custom Rates -- HAY AND FORAGE

	Actual Average		Projections			2014 versus 2013		
Operation	2009	2013	2012	2013	2014	$/unit chg	% chg	R^2
Rotary mow, $/acre	$12.00	$13.17	$14.86	$15.16	$15.45	$0.29	1.9%	0.955
Rotary mow, $/hour	$76.00	$70.00	$105.51	$111.32	$117.65	$6.33	5.7%	0.766
Hay-mow/swath, $/acre	$11.52	$12.86	$13.27	$13.54	$13.81	$0.27	2.0%	0.984
Forage-mow/swath, $/acre	$13.09	$14.92	$16.78	$17.28	$17.81	$0.52	3.0%	0.954
Swathing and condition, $/acre	$11.77	$13.54	$14.90	$15.38	$15.88	$0.50	3.3%	0.965
Sideraking hay, $/acre	$3.82	$4.58	$4.43	$4.47	$4.51	$0.04	0.8%	0.963
Small square with twine, $/bale	$0.92	$1.16	$1.16	$1.21	$1.28	$0.06	5.2%	0.972
Small square with wire, $/bale	$0.91	$1.28	$1.20	$1.24	$1.29	$0.04	3.5%	0.977
Round (< 1500 lbs) w/o net, $/bale	$10.45	$11.47	$11.88	$12.17	$12.48	$0.31	2.5%	0.980
Round (< 1500 lbs) w/ net, $/bale	$10.71	$12.34	$12.33	$12.57	$12.81	$0.24	1.9%	0.991
Round (> 1500 lbs) w/o net, $/bale	$10.56	$11.66	$11.90	$12.05	$12.19	$0.14	1.2%	0.953
Round (> 1500 lbs) w/ net, $/bale	$10.86	$12.92	$12.32	$12.52	$12.72	$0.20	1.6%	0.985
Square (approx 1 ton), $/bale	$13.58	$14.10	$13.99	$13.90	$13.79	-$0.11	-0.8%	0.747
Stacking hay (4-6 tons), $	$58.17	$68.82	$65.64	$66.48	$67.33	$0.85	1.3%	0.822
Hauling small squares, $/bale	$0.84	$0.83	$1.10	$1.15	$1.20	$0.05	4.3%	0.880
Hauling large round, $/bale	$4.35	$5.10	$5.01	$5.11	$5.22	$0.11	2.1%	0.924
Hauling large round, $/ton	$9.29	$9.44	$9.19	$9.21	$9.20	-$0.01	-0.1%	0.662
Entire operation (small square), $/bale	$1.77	$1.84	$2.08	$2.17	$2.27	$0.10	4.5%	0.940
Entire operation (large round), $/bale	$19.10	$22.34	$21.47	$21.67	$21.86	$0.18	0.8%	0.942
Entire operation, $/ton	$34.52	$33.47	$36.67	$37.33	$38.00	$0.67	1.8%	0.841

Table 8. Historical and Projected Custom Rates -- FEED PREPARATION AND DELIVERY

	Actual Average		Projections			2014 versus 2013		
Operation	2009	2013	2012	2013	2014	$/unit chg	% chg	R^2
Grinding grain, $/cwt	$0.41	$0.37	$0.51	$0.52	$0.54	$0.01	2.7%	0.616
Rolling grain, $/cwt	$0.37	$0.38	$0.47	$0.48	$0.49	$0.01	2.9%	0.772
Grinding hay, $/cwt	$0.61	$0.69	$0.57	$0.56	$0.56	$0.00	-0.1%	0.026
Mixing, $/cwt	$0.32	$0.33	$0.44	$0.45	$0.47	$0.02	3.4%	0.823
Rolling and mixing, $/cwt	$0.61	$0.72	$0.81	$0.83	$0.86	$0.03	3.1%	0.896
Grinding and mixing, $/cwt	$0.67	$0.69	$0.86	$0.89	$0.92	$0.03	3.4%	0.832
Pelleting, $/cwt	$0.90	$1.17	$1.12	$1.13	$1.15	$0.02	1.6%	0.869
Grinding, mixing and pelleting, $/cwt	$1.51	$1.37	$1.57	$1.60	$1.63	$0.03	1.7%	0.572
Sacking, $/cwt	$1.30	$1.49	$1.97	$2.06	$2.14	$0.09	4.3%	0.824
Delivery -- Method 1 (per load + mileage)								
$/load	$24.42	$24.42	$35.40	$36.66	$37.95	$1.28	3.5%	0.953
$/mile	$1.70	$1.70	$2.24	$2.31	$2.38	$0.07	3.2%	0.840
average load, tons	9.2	9.2	9.8	10.0	10.1	0.2	1.8%	0.885
Delivery -- Method 2 (per mile)								
$/mile	$2.54	$2.54	$3.21	$3.26	$3.30	$0.05	1.4%	0.884
average load, tons	10.4	10.4	11.1	11.3	11.5	0.2	1.8%	0.438
Delivery -- Method 3 (per ton)								
$/ton	$10.06	$10.06	$10.39	$10.58	$10.76	$0.18	1.7%	0.493
average load, tons	6.5	6.5	8.3	8.4	8.5	0.1	1.1%	0.127
Delivery -- Method 4 (per load)								
$/load	$32.85	$32.82	$50.97	$53.44	$56.05	$2.61	4.9%	0.949
average load, tons	6.6	6.6	7.3	7.4	7.4	0.0	0.6%	0.193
Delivery -- extra charge, $/mile	$2.10	$2.10	$2.81	$2.87	$2.93	$0.06	1.9%	0.884