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IMPACTS OF CHANGING TECHNOLOGY ON RENTAL SHARES



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Farm leases tend to reflect agriculture's recent history. When technology or farming systems change, the terms of farm leases should sometimes change. Whether the terms of leases should change depends on whether the change in technology or farming system affects the "fair" distribution of input costs and outputs between landlord and tenant.

This study involves a comparison of corn and soybeans grown under conventional versus no-till systems of production. The aim of the study is to determine if tillage method affects the division of shares between landlords and tenants.

Establishing share rental arrangements

When a share lease is used, a basic assumption is that the commodity produced in a share rental arrangement should be shared by the contributing parties in the same proportions as they contribute to the costs of production. All costs should be accounted for, no matter whether cash is spent to purchase the inputs or an opportunity cost is imputed for owned inputs.

Discussion of the contributions involved in a lease should help land owner and tenant be fair in their arrangement. Analyzing a share might begin with each party writing down his/her contributions to the crop production costs and an acceptable rate of return.

The land owner might record the market value of the land and an expected percent return on that contribution. Real estate tax paid would be a contribution. Shares of fertilizers, pesticides, and seeds would also be contributions.

The tenant would record the costs of his/her contributions. Expected costs would be fuel, repairs, labor, management, a percent of utilities, and a share of crop insurance, fertilizer, pesticides, and seed.

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EARLY, QUICK HARVEST PRESSURES ROW CROP PRICES



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US corn and soybean harvest is 20 percent ahead of normal in some states and early yields are reported at record or near record levels. The USDA September crop production report pegged corn and soybean production at 9.26 and 2.47 billion bushels, respectively. Most analysts believe that both crops will increase and be larger than the 1992 record production year. Wheat production was revised downward slightly to 2.36 billion bushels. Price response has been favorable for all commodities as support levels have not been penetrated for corn and beans and the wheat uptrend continues.

Corn price on the December futures has support at \$2.15 with the potential to decline another 10 cents to \$2.05 depending on how fast the harvest progresses. Wet conditions in the eastern corn belt may keep corn progress to normal rates and the \$2.15 support could hold.

Local storage capacity is being reached rapidly and piles of grain are beginning to appear. As a result, local basis is widening as farmers are encouraged not to deliver at this time. Short term storage will be profitable as basis improvement occurs after harvest pressure subsides. Storage into 1995 is also encouraged by the current carry in the futures contracts. Greater than break-even storage profits appear likely with current conditions.

This may also be a good time to consider buying call options to replace corn that must be sold. Feed grain buyers should seriously consider pricing several years' feed needs at these five year low prices. The use of call options is feasible for one year's worth of feed, and futures should be considered for longer term purchases. Rolling of these futures contracts would be necessary to get cost protection for two or three years into the future.

Finally, corn producers should consider using
(Continued on p.3)

Machinery investment should be capitalized. To capitalize, the machinery owner needs to estimate an expected return to cover ownership costs. If actual repairs are recorded, the remaining ownership costs would be depreciation, interest, and insurance. South Dakota does not assess any personal property tax at this time.

Farmers or land owners without detailed financial records may use average cost-of-production estimates. The South Dakota Cooperative Extension Service publishes crop budget estimates. These are available from county extension offices. Budgets represent typical practices for an area. They are intended as a comparison for actual on-farm records, not as a substitute for them.

Changing technology case study

This article examines expected shifts in the proportion of production costs borne by the landlord and the tenant when tillage systems change from conventional tillage to no-till. It is intended to facilitate negotiations between landlords and tenants, not to suggest the shares that should be stipulated in lease contracts.

The conventional farming system studied is described as "chisel plow." A chisel plow provides deep tillage for aeration. Mechanical cultivation is used for weed control. It is supplemented with recommended chemical herbicides. The no-till farming system involves no deep tillage. Weed control is provided by chemical herbicides. With both tillage systems, the same machinery complements are used for corn and soybeans as much as possible.

To accomplish the study purpose, I estimated the contributions made by landlords and tenants in the production of corn and soybeans under the two tillage systems. I chose northeast South Dakota as the study area. Corn and soybeans dominate crop land use in that region.

The dominant crop share lease in the area is 2/3-1/3 between tenants and landlords--with fertilizer, herbicide, and insecticide expenses shared. Each party provides crop insurance and drying for their share of the crop.

In this study, two share arrangements were considered: (1) the traditional 2/3-1/3 share with the landlord assuming all land costs plus 1/3 of the fertilizer and 1/3 of the chemical costs and (2) a 60-40 share arrangement in which the landlord assumed all land costs plus 40% of the fertilizer and chemical

costs.

Methods

The costs of production used in this assessment are based on a crop budget generator titled CROPBUDGET. The two corn budgets and two soybean budgets used in the comparison were prepared by Dr. Donald Peterson, SDSU for northeast South Dakota.

The allocation of contributions to the landlord or the tenant were mine. They reflect contributions generally assumed by landlords in the study area. The landlord contributes land and a share of chemicals and fertilizer. The tenant contributes all of the other inputs.

In the budgets generated, I made provision for three columns of costs. The first reflects "all costs." The second shows only the costs assumed by the landlord. The third shows the costs assumed by the tenant.

The costs assumed by the landlord are totaled and divided by the "all costs" column. The costs assumed by the tenant are also totaled and divided by "all costs".

The labor contribution is credited at \$7.50 per hour, and management is credited at about 5% of the value of sales. Machinery ownership costs are credited at about 20% of the investment per acre. Land charges are credited at 9.5% of land value plus real estate taxes. Cash operating expenses are based on current cost estimates.

Study results

The results of the crop budgeting analysis are presented in Tables 1-4. Table 1 shows the results for chisel plow tillage and no-till for corn produced with 2/3-1/3 shares; Table 2 shows the same comparison for corn, except that 60-40 shares are involved. Tables 3 and 4 show similar contrasts for soybeans.

For corn produced under a 2/3-1/3 share rental system and with chisel plow tillage, 69.5% of the costs are borne by the tenant and 30.5% are by the landlord (Table 1). With no-till, the share of costs borne by the tenant is 66.9% and those borne by the landlord are 33.1%. The same pattern of tenants bearing a slightly smaller share of expenses under no-till--compared to chisel plow--is shown in each of the other three comparisons.

Table 1. Corn Production Worksheet: Based on a 2/3 - 1/3 Share

	Chisel Plow			No-Till		
	Total	Tenant	Landlord	Total	Tenant	Landlord
Direct Costs (per Acre)						
Seed	\$ 18.40	\$ 18.40	\$.00	\$ 18.40	\$ 18.40	\$.00
Fertilizer	18.24	12.16	6.08	22.93	15.29	7.64
Herbicides	28.30	18.87	9.43	41.37	27.58	13.79
Insecticides	3.74	2.49	1.25	8.49	5.66	2.83
Storage	.00	.00	.00	.00	.00	.00
Overhead	4.70	4.70	.00	4.70	4.70	.00
Fuel & Lube	9.30	9.30	.00	7.94	7.94	.00
Repairs	11.20	11.20	.00	7.45	7.45	.00
Interest & Depreci. on Mach. Invest.	42.80	42.16	.64	35.59	34.66	.93
Labor @ \$7.50	11.70	11.70	.00	9.90	9.90	.00
Taxes	5.83	.00	5.83	5.83	.00	5.83
Management	7.80	7.80	.00	7.80	7.80	.00
Land Rent	<u>37.81</u>	<u>.00</u>	<u>37.81</u>	<u>37.81</u>	<u>.00</u>	<u>37.81</u>
TOTAL	\$199.83	\$138.78	\$61.04	\$208.20	\$139.37	\$68.83
		69.5%	30.5%		66.9%	33.1%

Table 2. Corn Production Worksheet: Based on a 60 - 40 Share

	Chisel Plow			No-Till		
	Total	Tenant	Landlord	Total	Tenant	Landlord
Direct Costs (per Acre)						
Seed	\$ 18.40	\$ 18.40	\$.00	\$ 18.40	\$ 18.40	\$.00
Fertilizer	18.24	10.94	7.30	22.93	13.76	9.17
Herbicides	28.30	16.98	11.32	41.37	24.82	16.55
Insecticides	3.74	2.24	1.50	8.49	5.09	3.40
Storage	.00	.00	.00	.00	.00	.00
Overhead	4.70	4.70	.00	4.70	4.70	.00
Fuel & Lube	9.30	9.30	.00	7.94	7.94	.00
Repairs	11.20	11.20	.00	7.45	7.45	.00
Interest & Depreci. on Mach. Invest.	42.80	42.03	.77	35.59	34.48	1.11
Labor @ \$7.50	11.70	11.70	.00	9.90	9.90	.00
Taxes	5.83	.00	5.83	5.83	.00	5.83
Management	7.80	7.80	.00	7.80	7.80	.00
Land Rent	<u>37.81</u>	<u>.00</u>	<u>37.81</u>	<u>37.81</u>	<u>.00</u>	<u>37.81</u>
TOTAL	\$199.83	\$135.30	\$64.52	\$208.20	\$134.33	\$73.87
		67.7%	32.3%		64.5%	35.5%

Table 3. Soybean Production Worksheet: Based on a 2/3 - 1/3 Share

	Chisel Plow			No-Till		
	Total	Tenant	Landlord	Total	Tenant	Landlord
Direct Costs (per acre)						
Seed	\$ 15.00	\$15.00	\$.00	\$ 22.50	\$22.50	\$.00
Fertilizer	4.58	3.05	1.53	4.90	3.26	1.64
Herbicides	29.29	19.53	9.76	44.19	29.46	14.73
Inoculant	.95	.95	.00	1.50	1.50	.00
Storage	---	---	---	---	---	---
Overhead	3.24	3.24	.00	4.22	4.22	.00
Fuel & Lube	4.56	4.56	.00	3.22	3.22	.00
Repairs	7.64	7.64	.00	4.30	4.30	.00
Interest & Depreci. on Mach. Invest.	27.25	26.82	.43	18.60	17.97	.63
Labor @ \$7.50	6.30	6.30	.00	4.50	4.50	.00
Taxes	5.83	.00	5.83	5.83	.00	5.83
Management	8.10	8.10	.00	8.10	8.10	.00
Land Rent	<u>37.81</u>	<u>.00</u>	<u>37.81</u>	<u>37.81</u>	<u>.00</u>	<u>37.81</u>
TOTAL	\$150.55	\$95.19	\$55.36	\$159.66	\$99.03	\$60.63
		63.2%	36.8%		62.0%	38.0%

Table 4. Soybean Production Worksheet: Based on a 60 - 40 Share

	Chisel Plow			No-Till		
	Total	Tenant	Landlord	Total	Tenant	Landlord
Direct Costs (per Acre)						
Seed	\$ 15.00	\$15.00	\$.00	\$ 22.50	\$22.50	\$.00
Fertilizer	4.58	2.75	1.83	4.90	2.94	1.96
Herbicides	29.29	17.57	11.72	44.19	26.51	17.68
Inoculant	.95	.95	.00	1.50	1.50	.00
Storage	---	---	---	---	---	---
Overhead	3.24	3.24	.00	4.22	4.22	.00
Fuel & Lube	4.56	4.56	.00	3.22	3.22	.00
Repairs	7.64	7.64	.00	4.30	4.30	.00
Interest & Depreci. on Mach. Invest.	27.25	26.72	.53	18.60	17.83	.77
Labor @ \$7.50	6.30	6.30	.00	4.50	4.50	.00
Taxes	5.83	.00	5.83	5.83	.00	5.83
Management	8.10	8.10	.00	8.10	8.10	.00
Land Rent	<u>37.81</u>	<u>.00</u>	<u>37.81</u>	<u>37.81</u>	<u>.00</u>	<u>37.81</u>
TOTAL	\$150.54	\$92.44	\$58.10	\$159.66	\$95.01	\$64.65
		61.4%	38.6%		59.5%	40.5%

Conclusions

The examples used in this study represent relatively pure farming systems. Many farmers are implementing modified versions. They may be increasing herbicide use to eliminate one or two cultivations. They perform tillage for seed bed preparation and emergency weed control.

It appears there is a slight shift of contributions in favor of the tenant when farming practices are converted from conventional tillage to no-till. The appropriate share of inputs and product sales can be swayed a few percentage points by changing the acceptable returns for the contributing parties. If a lower dollar value per hour for labor is used, the landlord's share would increase. If a lower return to land per acre is used, the tenant's share would increase.

It appears that either a 2/3-1/3 share or a 60-40 share might be fair depending on the assumptions by the parties involved. The terms of rental agreements are usually determined after compromises are made between the parties.

The percent contributed by the landowner is higher for soybeans than corn in this comparison. When the tenant rotates acreage between corn and soybeans, the lease should probably reflect an average of the two crops.

Shane ... (Cont'd. from p.1)

government loan program proceeds to reduce interest cost of storing grain and evaluate loan deficiency payment (LDP) alternatives for corn that must be sold. You must have title to the grain in order to receive a LDP. Check with your ASCS office for details before selling your grain.

Soybean price on the November futures has support at \$5.50 with downside potential to around \$5.20. Harvest pace is pressuring bean price but strong export demand is offsetting this pressure to drop lower. It makes sense for importers to begin buying their crush needs now as prices are near five year lows. This could mean that demand will taper off later in the year and limit returns to storage to break-even. Using loan proceeds to offset interest cost of stored grain reduces the price increase



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necessary to pay storage costs by \$.02 to \$.025 per month.

Soybean price is vulnerable to setbacks because even with strong demand, world carry-over stocks are expected to increase this year. Spring weather will play a large role in determining longer term profits to storing soybeans. Buying call options at the current market lows and selling beans after post-harvest basis gains may prove to be a good marketing strategy this year.

Wheat price has been uptrending since harvest. The major reasons are low US and world stocks and poor wheat crops in China, a major importer and Australia, a major exporter. Egypt has been actively seeking US wheat to replace quantities they normally purchase from Australia.

Current wheat futures prices near \$4.00 are in the top third of all time highs for wheat. At the same time local prices are in the high \$3's which seem low compared to last year when protein premiums were very high. Protein is not in short supply this year and premiums will not rally much, if any, so the current cash prices should be considered quite good.

Strategies that involve the sale of one-third to one-half of wheat stocks now seem very prudent. Upside potential is around another \$.30 per bushel while the downside is considerably larger. Basis levels are good so purchase of May or July calls for those who want to maintain ownership of sold cash wheat will leave the top open while eliminating downside risk for the wheat sold. Watch the uptrend in wheat closely on the December futures contract. A break through to the downside is a signal to sell more of your cash wheat.

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