An Evaluation of Alternative Cash, Share, and Flexible Leasing Arrangements for South Carolina Grain Farms [*]

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Abstract

A simulation model incorporating stochastic yields, prices, and government payments generates returns for landowners and tenants under cash, share, and flexible leases. Corn, soybeans, wheat, cotton, peanuts, and wheat-double crop soybeans crop enterprises are studied. Alternatives are evaluated by mean returns, coefficient of variation, and certainty equivalent analysis.

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Farm business managers are continuously looking for opportunities to spread their fixed costs over additional acreage. Leasing land may be the preferred method of expanding the farm business, as the large investment associated with purchasing land can be avoided. As tenants bid to rent additional land, competition may cause tenants to bid at rates that exceed the economic return to land.

Tenants face the problem of determining an economical rental bid given the uncertainty of yields and prices. Yield risk has been evident in South Carolina from 1998-2002, as the state experienced severe drought conditions each year. Commodity prices have also been below their ten-year average each year of the drought. Despite below average yields and prices, cash rental rates have increased due, in part, to government program payments. The 2002 Farm bill establishes a three-tiered system of payments to reduce revenue risk (USDA Farm Bill). The direct payment rates are known with certainty while the counter-cyclical payments and loan deficiency payments are uncertain. The direct and counter-cyclical program payments are made to the producers, with landowners eligible to receive payments only if they share in the business risk. Landowners have an incentive to increase cash rental rates to capture the direct and potential counter-cyclical payments. Similarly, tenants may increase their rental bid based on their expectation of counter-cyclical payments and loan deficiency payments that may not occur.

Both landowners and tenants are making decisions under uncertainty. Tenants have the challenge of determining the economic return to land when prices, yields, and government program payments are uncertain. Landowners face similar uncertainty in determining a rental rate that generates the largest return that the rental market will bear. Given the competition in the rental market, tenants may over-bid for land. Flexible leasing arrangements that adjust the rent based on

actual prices or yields may provide income stability to the landowner as well as helping tenants reduce the risk from over-bidding for rented land.

Literature

Langemeier, Albright, and Delano discuss the advantages and disadvantages of alternative farmland leases. An advantage of a crop-share lease is that price and yield risk, as well as input costs, are shared with the landowner. Another potential advantage of a share lease is that the landowner is involved in making management decisions. This could be beneficial for a producer that does not have extensive management experience, like a beginning farmer. Of course, joint management decisions may create conflict between the tenant and landowner if they do not agree on management practices. Another disadvantage is that detailed records must be kept to ensure accurate division of costs and production. While downside risk is limited in a share lease, the cash equivalent of a share lease may be significantly greater than the cash rental rate during years of above average yields or prices (Langemeier, Albright, and Delano).

An advantage of cash leases is that the lease is easy to implement. Detailed record-keeping is not needed to accurately divide expenses and production, as the tenant pays all of the expense and receives all of the production. The landowner does not share the price or yield risk and does not have the responsibility of marketing their share of the crop. Since the landowner does not have input into management decisions, the potential for landowner/tenant conflict is reduced. A disadvantage of a cash lease is that the tenant may not make improvements to the land, such as maintaining fertility levels. Another disadvantage of a cash lease is that he tenant has all of the business risk and pays all of the production costs (Langemeier, Albright, and Delano).

An alternative to cash and share leases are flexible leases that adjust the cash rental rate by the actual harvest price or yield. Under flexible leases, landowners share the price or yield risk but still have a guaranteed base rental rate (Edwards).

Muzinga, Lins, and Boehlje analyzed the returns to landowners and tenants for cash, share and flexible leases. They found that flexible leases have greater risk and only slightly larger mean returns over a cash lease. The conclusion is that landowners have little incentives to switch from a cash lease to a flexible lease (Muzinga, Lins, and Boehlje).

Held, in an analysis of cash, share, and flexible leases for an Indiana corn and soybean farm, found that tenants would prefer a share lease while landowners would prefer cash leases. While flexible leases reduced risk, purchasing crop insurance with cash leases provided greater risk reduction than the flexible leasing alternatives (Held).

Methods

A stochastic simulation model is used to simulate the return to unpaid labor, management, and fixed machinery costs for corn, soybeans, wheat, cotton, peanuts, and wheat-double crop soybeans in South Carolina. The stochastic simulation model incorporated yield, price and government program payment risks in calculating the return for commodity *i* (equation 1).

(1) $$\tilde{\pi}_i = \tilde{P}_i\tilde{Y}_i + \overline{DP_i} + \tilde{C}_i - \overline{VC}_i - \tilde{R}_i$$

The variables $\tilde{P}_i$ and $\tilde{Y}_i$ are the stochastic sales price and stochastic yield, respectively, for commodity *i* (equation 1). The variables $\overline{DP_i}$ and $\tilde{C}_i$ in equation 1 represent the direct and counter-cyclical payments, respectively, for commodity *i*. The direct payments are constant while the counter-cyclical payments are stochastic (equation 1). The variable cost of producing commodity *i*, based on crop enterprise budgets, is represented by $\overline{VC}_i$ (equation 1). The variable

cost of producing commodity *i* is held constant in the simulation model. The variable $\tilde{R}_i$ is the amount of rent paid for an acre of land to produce commodity *i*.

The stochastic yield and price for commodity *i* are drawn from a multivariate empirical distribution based on the procedures outlined in Richardson, Klose, and Gray. Equation 2 describes the stochastic yield for commodity *i*:

(2) $\tilde{Y}_i = \overline{Y}_i(1+\tilde{\varepsilon}_{y_i})$ $\tilde{\varepsilon}_{y_i}$ ~ multivariate empirical

where $\tilde{Y}_i$ is the stochastic yield for commodity *i*. The deterministic yield, $\overline{Y}_i$, is the state-level average yield for commodity *i* from 1991-2002. The stochastic component, $\tilde{\varepsilon}_{y_i}$, is calculated as the percent deviation from the average yield from 1991-2002 for commodity *i*. The yield is made stochastic by multiplying the deterministic yield component ($\overline{Y}_i$) by one plus the stochastically generated percent deviation from the average yield ($\tilde{\varepsilon}_{y_i}$). The percent error terms are coefficient of variation stationary, which means that the relative yield variability for commodity *i* is constant. However, as the deterministic yield component increases, the absolute yield variability increases.

The stochastic prices are also drawn from multivariate empirical distributions. Equation 3 through equation 6 describes how the cash price and loan deficiency payment for commodity *i* are determined. The cash market price is based on the stochastic futures market price, described in equation 3.

(3) $\tilde{P}_i^{fut} = \overline{P}_i^{fut}(1+\tilde{\varepsilon}_{p_i})$ $\tilde{\varepsilon}_{p_i}$ ~ multivariate empirical

where $\tilde{P}_i^{fut}$ is the stochastic futures market price for commodity *i* at harvest. The deterministic component, $\overline{P}_i^{fut}$, is the average futures market price at harvest for commodity *i* from 1991-2002.

The stochastic price component, $\tilde{\varepsilon}_{p_i}$, is calculated as the percent deviation from the average futures market price from 1991-2002.

The cash price for commodity *i* is the stochastic futures market price plus the cash market basis, as described in equation 4.

(4) $$\tilde{P}_i^{cash} = \tilde{P}_i^{fut} + \overline{B}_i^{cash}$$

The cash market basis, $\overline{B}_i^{cash}$, is the average harvest time basis for commodity *i* from 1999-2002 (Curtis).

The marketing loan program in the 2002 Farm Bill reduces price risk by providing loan deficiency payments whenever the posted-county price is below the commodity loan rate. The stochastic posted-county price and stochastic loan deficiency payments are described in equation 5 and equation 6, respectively.

(5) $$\tilde{P}_i^{pcp} = \tilde{P}_i^{fut} + \overline{B}_i^{pcp}$$

(6) $$\tilde{L}_i = Max(0, LoanRate_i - \tilde{P}_i^{pcp})$$

The posted-county price basis for commodity *i*, $\overline{B}_i^{pcp}$, is the average harvest posted-county price basis for commodity *i* from 1999-2002 (Curtis). The loan deficiency payment for commodity *i*, $\tilde{L}_i$, is the larger of zero or the difference between the loan rate and the stochastic posted-county price (equation 6).

It is important to recognize that the cash basis, $\overline{B}_i^{cash}$, is typically different than the posted-county price basis, $\overline{B}_i^{pcp}$, for grains in the Southeast. Posted-county prices are determined by the cash price at terminal Midwestern and Gulf port locations. They are then adjusted to a particular county based on fixed and variable differentials as determined by USDA. On any given day local

grain supply and demand conditions might generate a substantial difference in the cash price paid locally for grain versus the posted-county price (Curtis).

The price producers receive for corn, soybeans, wheat, cotton, and wheat-double crop soybeans is the stochastic cash price plus the stochastic loan deficiency payment (equation 7).

(7) $$\tilde{P}_i = \tilde{P}_i^{cash} + \tilde{L}_i$$

Peanuts, however, are assumed to be produced under a production contract that pays a premium of $25 per ton above the marketing loan rate. The premium of $25 per ton was commonly offered to South Carolina peanut producers in 2003 (Smith). The peanut sales price is constant in the stochastic simulation model due to the use of production contracts.

The stochastic simulation model also includes the revenue producers receive from government program payments. The amount received from direct payments for commodity *i* is described in equation 8 (USDA Farm Bill).

(8) $$\overline{DP_i} = Base\ Acres_i\ x\ Program\ Yield_i\ x\ 85\%\ x\ Direct\ Payment\ Rate_i$$

where the base acres and program yield for commodity *i* are calculated on historical production from the 1980's. The direct payment rate is defined in the 2002 Farm Bill and is paid on 85% of historic production (equation 8).

In contrast, the counter-cyclical payments are stochastic as they depend on the U.S. marketing-year average price for commodity *i*. The counter-cyclical payments are defined by equation 9 and 10.

(9) $$\tilde{C}_i = Base\ Acres_i\ x\ Program\ Yield_i\ x\ 85\%\ x\ CCP\ Rate_i$$

where the base acres and program yield are based on historical production from either the 1980's or 1998-2001 (USDA Farm Bill). The counter-cyclical payment rate is stochastic and defined in equation 10.

(10) $CCP\ Rate_i = Max\ (0, Target\ Price_i - Direct\ Payment\ Rate_i - Max\ (U.S.\ MYA\ Price, U.S.\ Loan\ Rate)$

The counter-cyclical payment is the target price for commodity *i* less the direct payment and the larger of the U.S. marketing-year average price or U.S. loan rate for commodity *i* (equation 10). The counter-cyclical payment is zero when the U.S. marketing-year average price plus the direct payment rate is greater than the target price. The maximum counter-cyclical payment is made when the U.S. marketing-year average price is below the U.S. loan rate for commodity *i*. (USDA Farm Bill)

Alternative Leasing Arrangements

This study evaluates five leasing alternatives. One leasing alternative is to pay a fixed, cash rental rate for each acre of cropland. The cash rental rate used in the simulation model is held constant at $28.50 per acre, which is the South Carolina state average rental rate for 2002 (South Carolina Agricultural Statistics).

An alternative to a cash lease is a share lease where production and input expense are shared by the tenant and landowner. The direct and counter-cyclical payments are also shared by the proportion of the risk being shared with the landowner. A 50%-50% share lease will be used in this study with the landowner sharing the crop seed, fertilizer, chemical, drying and storage expense.

Three flexible leasing arrangements are also simulated. Equation 12 describes a lease that adjusts the rental rate by the relationship between the actual harvest price for commodity *i* compared to an index of harvest-time price (Held).

(12) $$\tilde{R}_i^p = \bar{R}_i^{cash} \frac{\tilde{P}_i}{I_i^p}$$

where $\bar{R}_i^{cash}$ is the cash rental rate for commodity *i*, $\tilde{P}_i$ is the actual harvest-time cash price for commodity i from the simulation model, and I_i^p is the five-year average harvest-time price for commodity *i*. The cash rent is increased for above-average prices and decreased for below average prices.

A flexible lease that adjusts for yield variability is described in equation 13 (Held).

(13) $$\tilde{R}_i^y = \bar{R}_i^{cash} \frac{\tilde{Y}_i}{I_i^y}$$

where $\bar{R}_i^{cash}$ is the cash rental rate for commodity *i*, $\tilde{Y}_i$ is the actual harvested yield for commodity *i* from the simulation model, and I_i^y is the five-year average harvested yield for commodity *i*. The cash rent is increased for above-average yields and decreased for below average yields.

Equation 14 defines a lease that adjusts the rent based on the actual price and the actual yield (Held).

(14) $$\tilde{R}_i^{py} = \bar{R}_i^{cash} \frac{\tilde{P}_i}{I_i^p} \frac{\tilde{Y}_i}{I_i^y}$$

where the cash rent is adjusted for both price and yield variability.

Certainty Equivalent Analysis

The leasing alternatives are ranked by their certainty equivalents to determine the effect of risk attitudes on the leasing alternatives preferred by the tenant and landowner. The certainty equivalents are calculated for coefficients of relative risk aversion ranging from 0 (risk neutral) to 5 (extremely risk averse). The power utility function, defined in equation 15, is used to calculate the

expected utility and certainty equivalents because this function has constant relative risk aversion (Hardaker, Huirne, and Anderson).

$$(15) \qquad E[U(X_i)] = \sum_{j=1}^{n} \rho_j \frac{X_{i,j}^{1-r}}{1-r}$$

where r is the coefficient of relative risk aversion and ρ_j is the probability of having outcome *j* occurring. The certainty equivalent is found by inverting equation 15, as described in equation 16.

$$(16) \qquad CE_i = (1-r)E[U(X_i)]^{\frac{1}{1-r}}$$

Data

The summary statistics of the yield and price data used as inputs in the stochastic simulation model are reported in Table 1. The yield data are South Carolina state average yields from 1991 – 2002 (USDA NASS). Cotton yields averaged 610 pounds per acre from 1991-2002, but the yield has ranged from 314 pounds to 846 pounds per acre (Table 1). Similarly, corn yields have ranged from 40 bushels an acre to 108 bushels an acre over the same time period (Table 1). Corn and cotton have larger coefficients of variation, 0.30 and 0.26, respectively, than the other commodities (Table 1). Peanuts and soybeans have coefficients of variation of 0.16, which are the smallest coefficients of variation of all of the commodities (Table 1). In other words, peanuts and soybeans have the smallest relative yield risk while corn has the largest relative yield risk.

Commodity futures prices have also varied greatly from 1991-2002. December corn futures have ranged from \$1.93 to \$3.20 per bushel at harvest while December cotton futures have ranged from \$0.31 to \$0.85 per pound from 1991-2002 (Table 1). Cotton and wheat futures have the largest relative risk, with coefficients of variation of 0.24 and 0.22, respectively (Table 1).

The stochastic counter-cyclical payments are based on U.S. marketing-year average prices described in Table 1. Cotton prices have ranged from $0.30 to $0.75 per pound while soybean prices have ranged from $4.38 to $7.35 per bushel (Table 1).

The cash market and posted-county price basis data were collected on a daily basis from 1999-2002. The cash market basis used in the simulation are $0.00, -$0.40, $-0.30, and -$0.035 for corn, soybeans, wheat and cotton, respectively (Curtis). Similarly, the posted-county price basis used in the simulations are -$0.17, -$0.31, -$0.43, and –$0.075 for corn, soybeans, wheat, and cotton, respectively (Curtis).

The 2002 loan rates used in calculating the loan deficiency payments are for South Carolina covered commodities and are $2.18, $5.05, $2.45, $0.52, and $353.66, for corn, soybeans, wheat, cotton, and Virginia peanuts, respectively (USDA FSA). The loan rate for Virginia type peanuts is used in the study because this type of peanut is being offered a premium of $25 per ton over the loan rate (Smith). The direct and counter-cyclical payments are calculated using the rates defined in the 2002 Farm Bill for the 2004 production year (USDA Farm Bill).

The variable costs of production are from Clemson University crop enterprise budgets for conventional tillage systems (Ferreira). The variable costs used in the stochastic simulation model are $172, $90, $138, $382, $431, and $193 per acre for corn, soybeans, wheat, cotton, peanuts, and wheat-double crop soybeans, respectively (Ferreira).

Results

Tenants received the largest average return to unpaid labor, management and fixed machinery costs under cash leases for all crops simulated (Table 2 and Table 4). Flexible leases do reduce revenue risk. but at a trade-off of lower average returns (Table 2). From the tenant’s perspective, the price-yield flexible lease has the smallest coefficient of variation for corn,

soybeans, and wheat-double cropped soybeans while the yield adjusted lease has the smallest coefficient of variation for peanuts (Table 4).

In contrast, landowners received the largest average rent from a 50-50 crop share lease (Table 3 and Table 4). Based on average returns, landowners would rank cash leases as the least preferred alternative (Table 5). However, the constant return makes the cash lease preferred by landowners wanting the smallest coefficient of variation of return (Table 5).

The results suggest that risk attitudes do not have much effect on the tenant's preferred leasing alternative. Tenants prefer cash leases for coefficients of relative risk aversion from 0 to 3 (Table 6). As tenants become more risk averse, crop share leases are preferred (Table 6). Risk attitudes also has little effect on landowner's lease preference, as share leases have the largest certainty equivalent for every crop except wheat (Table 6). The price-yield flexible lease is preferred by landowners renting land for wheat production (Table 6).

Summary and Conclusions

This preliminary study of flexible leasing arrangements suggest that producers wanting to share price and yield risk should consider share leases. However, a share other than 50-50 should be considered, as the cash equivalent of this lease can be significantly greater than a cash lease. This may not be practical due to absentee landowners, landowners do not have the production or marketing skills to adopt a share lease, or the landowner's desire to keep the lease simple.

Future research will consider a larger cash rent, especially for cotton and peanut production. The state average rental rate understates the economic return to land for these high value commodities. Future research will consider the risk reducing benefits of crop insurance in reducing revenue risk.

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Table 1. Summary Statistics of Yields, Futures Market Prices, and Marketing-Year Average Prices Data for the Stochastic Simulation Model.

	Average	Standard Deviation	Maximum	Minimum	C.V. [a]
Corn Yield [b] (bushels per acre)	74	22	108	40	0.30
Soybean Yield [b] (bushels per acre)	22	3	27	15	0.16
Wheat Yield [b] (bushels per acre)	41	7	50	31	0.17
Cotton Yield [b] (pounds per acre)	610	156	846	314	0.26
Peanut Yield [b] (pounds per acre)	2604	404	3100	1750	0.16
December Corn Futures Price [c]	$2.44	$0.40	$3.20	$1.93	0.16
November Soybean Futures Price [d]	$5.77	$0.93	$7.27	$4.39	0.16
July Wheat Futures Price [e]	$3.20	$0.71	$4.97	$2.51	0.22
December Cotton Futures Price [f]	$0.61	$.15	$0.85	$0.31	0.24
Corn Marketing-Year Price [g]	$2.29	$0.41	$3.24	$1.82	0.18
Soybean Marketing Year Price [g]	$5.63	$0.94	$7.35	$4.38	0.17
Wheat Marketing Year Price [g]	$3.17	$0.67	$4.41	$2.29	0.21
Cotton Marketing Year Price [g]	$0.57	$0.13	$0.75	$0.30	0.23
Peanut Price [h]	$0.20	$0.04	$0.31	$0.17	0.19

[a.] The C.V. is the coefficient of variation which is the standard deviation divided by the average.
[b.] South Carolina State Average Yield from 1991-2002.
[c.] Average closing price during September from 1991-2002.
[d.] Average closing price during November from 1991-2002.
[e.] Average closing price during June from 1991-2002.
[f.] Average closing price during October from 1991-2002.
[g.] U.S. Marketing year average price from 1991-2002
[h.] Farm-level price of peanuts derived from Rotterdam peanut prices from 1991-2002.

Table 2. Average and Standard Deviation of the Tenant's Return to Unpaid Labor, Management and Fixed Machinery for Alternative Leasing Arrangements ($/Acre).

	Corn	Soybeans	Wheat	Cotton	Peanuts	Wheat-DC Soybeans
Cash [b.]	$105.02 [a]	$85.05	$19.95	$97.49	$190.20	$169.25
	(81.50)	(35.46)	(34.17)	(110.28)	(87.86)	(68.09)
Share [c.]	52.59	43.46	10.34	16.25	93.21	73.66
	(40.75)	(17.73)	(17.09)	(55.14)	(55.93)	(34.05)
Price [d.]	104.02	81.33	14.37	95.11	186.84	164.60
	(80.92)	(32.74)	(31.32)	(110.01)	(90.12)	(65.06)
Yield [e.]	98.06	71.99	12.35	88.79	184.50	158.92
	(71.79)	(30.95)	(29.70)	(101.78)	(83.41)	(63.66)
Price-Yield [f.]	96.84	66.59	5.30	85.71	180.48	152.61
	(70.51)	(25.78)	(24.49)	(100.65)	(85.79)	(58.42)

[a.] The average return is the top number while the standard deviation is in parentheses.
[b.] Cash lease.
[c.] A 50-50 crop share lease.
[d.] Flexible lease adjusted by harvest-time price.
[e.] Flexible lease adjusted by harvested yield.
[f.] Flexible lease adjusted by harvest-time price and harvested yield.

Table 3. Average and Standard Deviation of the Landowner's Return for Alternative Leasing Arrangements ($/Acre).

	Corn	Soybeans	Wheat	Cotton	Peanuts	Wheat-DC Soybeans
Cash [b]	$28.50 [a]	$28.50	$28.50	$28.50	$28.50	$28.50
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Share [c]	80.93	70.09	38.42	109.75	188.14	124.10
	(40.75)	(17.73)	(17.09)	(55.14)	(55.93)	(34.05)
Price [d]	29.50	32.22	34.08	30.88	31.86	33.15
	(4.53)	(5.33)	(5.78)	(5.06)	(5.38)	(5.56)
Yield [e]	35.46	41.56	36.10	37.21	34.20	38.83
	(10.14)	(6.11)	(5.96)	(9.03)	(5.00)	(5.85)
Price-Yield [f]	36.68	46.97	43.15	40.28	38.22	45.15
	(11.94)	(10.34)	(10.19)	(11.78)	(8.53)	(10.13)

[a.] The average return is the top number while the standard deviation is in parentheses.
[b.] Cash lease.
[c.] A 50-50 crop share lease.
[d.] Flexible lease adjusted by harvest-time price.
[e.] Flexible lease adjusted by harvested yield.
[f.] Flexible lease adjusted by harvest-time price and harvested yield.

Table 4. Tenant and Landowner Rankings of Alternative Leases Based on Mean Return.

	Corn	Soybeans	Wheat	Cotton	Peanuts	Wheat-DC Soybeans
	Tenant's Rankings by Mean Return					
Cash [a]	1 [f]	1	1	1	1	1
Share [b]	5	5	4	5	5	5
Price [c]	2	2	2	2	2	2
Yield [d]	3	3	3	3	3	3
Price-Yield [e]	4	4	5	4	4	4
	Landowner's Rankings by Mean Return					
Cash	5	5	5	5	5	5
Share	1	1	2	1	1	1
Price	4	4	4	4	4	4
Yield	3	3	3	3	3	3
Price-Yield	2	2	1	2	2	2

[a.] Cash lease.
[b.] A 50-50 crop share lease.
[c.] Flexible lease adjusted by harvest-time price.
[d.] Flexible lease adjusted by harvested yield.
[e.] Flexible lease adjusted by harvest-time price and harvested yield.
[f.] A one is the most preferred alternative and a five is the least preferred alternative.

Table 5. Tenant and Landowner Rankings of Alternative Leases by the Coefficient of Variation of Returns.

	Corn	Soybeans	Wheat	Cotton	Peanuts	Wheat-DC Soybeans
	Tenant's Rankings by Coefficient of Variation of Returns					
Cash [a]	4	4	2	1 [f]	2	4
Share [b]	3	3	1	5	5	5
Price [c]	5	2	3	3	4	2
Yield [d]	2	5	4	2	1	3
Price-Yield [e]	1	1	5	4	3	1
	Landowner's Rankings by Coefficient of Variation of Returns					
Cash	1	1	1	1	1	1
Share	5	5	5	5	5	5
Price	2	3	3	2	3	3
Yield	3	2	2	3	2	2
Price-Yield	4	4	4	4	4	4

[a.] Cash lease.
[b.] A 50-50 crop share lease.
[c.] Flexible lease adjusted by harvest-time price.
[d.] Flexible lease adjusted by harvested yield.
[e.] Flexible lease adjusted by harvest-time price and harvested yield.
[f.] A one is the most preferred alternative and a five is the least preferred alternative.

Table 6. Tenant and Landowner Certainty Equivalent Maximizing Leasing Alternatives for Varying Risk Preferences.

	Corn	Soybeans	Wheat	Cotton	Peanuts	Wheat-DC Soybeans
CRRA [a]	Tenant's Certainty Equivalent Maximizing Lease					
0	Cash [b]	Cash	Cash	Cash	Cash	Cash
1	Cash	Cash	Cash	Cash	Cash	Cash
2	Cash	Cash	Share	Yield	Cash	Cash
3	Yield	Cash	Share	Yield	Yield	Cash
4	Yield	Cash	Share	Share	Yield	Cash
5	Yield	Cash	Share	Share	Yield	Cash
CRRA	Landowner's Certainty Equivalent Maximizing Lease					
0	Share	Share	Price-Yield	Share	Share	Share
1	Share	Share	Price-Yield	Share	Share	Share
2	Share	Share	Price-Yield	Share	Share	Share
3	Share	Share	Price-Yield	Share	Share	Share
4	Share	Share	Price-Yield	Share	Share	Share
5	Share	Share	Price-Yield	Price-Yield	Share	Share

[a.] Coefficient of Relative Risk Aversion where a zero represents risk neutral behavior while a five represents extremely risk averse behavior.

[b.] Leasing alternative that maximizes the certainty equivalent for the Coefficient of Relative Risk Aversion. Cash represents a cash lease, share is a crop-share lease, price is a flexible lease adjusted by harvest price, yield is a flexible lease adjusted by harvested yield, and price-yield is a flexible lease adjusted by harvest price and yield.