

*Risk Management*

## Determining Cropland Cash Rental Arrangements

Jay Yates, Steven Klose, Jackie Smith, Joe Outlaw, and Kevin Dhuyvetter\*

Many crop producers rely heavily on rented land in their farming operations. Crop land is typically rented in one of three ways: (1) cash rent; (2) crop share; or (3) cash/share combination. While crop share leases have been the most common method of renting land, interest in cash rents is increasing. Reasons include: 1) increased planting flexibility; 2) landowners not wanting to share the increased expenses of new tillage/cropping systems or production technologies; 3) older landowners wanting fixed income; 4) increased farm size and number of landowners per tenant; and 5) difficulty in prorating long-term capital investments in certain technologies (e.g., precision agriculture).

The rental arrangements between landowners and producers can significantly affect risk and profitability, and producers should understand those effects.

This publication describes cash rent leases and compares them to crop share arrangements. For more information on crop share rental see RM 5-13.0, *Determining Cropland Share Rental Arrangements*.

### **Determining Cash Rent Rates**

Landowners and tenants often request help in determining rental rates. Economic theory says that an equilibrium rate occurs where the supply

of land equals the demand for land. How do we arrive at an equilibrium price? Typically, landowners and tenants negotiate to find a cash lease rate that is “fair” to both parties.

In areas where there is sufficient cash renting, the prevailing cash rent market price will help determine the “fair” rent. However, in some areas there is no established rental rate, or, if there is one, the rate is based on extenuating circumstances that make it inappropriate as a guideline (e.g., rate includes buildings or machinery, rent is between family members). In these cases, the rate negotiation may begin with factors such as the landowner’s cost, the amount the tenant can afford to pay, and/or the crop share adjusted for risk (Langemeier).

Landowner’s cost refers to the opportunity cost of land investment, less expected capital gains, plus real estate tax. The idea is that a landowner expects some net rate of return on his investment in the land. This net rate of return can be approximated by the historical average rent-to-value ratio. The cash rent would be calculated by multiplying the rent-to-value ratio by the market value of the land.

The “amount a tenant can afford to pay” method of establishing cash rents says that the tenant receives all income and pays all expenses and whatever is left is available for cash rent to the landowner. In practice, landowner’s cost and



\*Extension Program Specialist III – Risk Management, Associate Professor and Extension Economist – Risk Management, Professor and Extension Economist – Management, and Professor and Extension Economist – Management, The Texas A&M University System, and Extension Agricultural Economist – Kansas State University Agricultural Experiment Station and Cooperative Extension Service.

amount a tenant can afford to pay often represent lower and upper bounds, respectively, to the rent negotiation process. But, if individual land ownership and tenant profitability values are used, rather than averages, it may be that the “amount a tenant can afford” is actually less than land ownership costs. Nonetheless, these values help establish a framework within which to begin rent negotiation.

Because many landowners and tenants are familiar with crop share arrangements, using a crop share approach to determine a cash rental rate is practical. This approach determines the cash equivalent amount of an equitable crop share arrangement and then often makes a risk adjustment to that value. The reason for making the risk adjustment is that with cash rent all of the production and price risk falls on the producer, whereas with crop share this risk is shared between the producer and the landowner.

### **Risk-return Tradeoff**

With any type of investment, increased returns generally are associated with increased risk (Fig. 1). To realize higher average returns ( $\bar{x}$ ), a person must be willing to take on more risk ( $S_x$ ). Similarly, a person desiring less risk will need to accept lower returns. Putting this in the crop share and cash rent framework, it seems reasonable that a landowner would be willing to accept lower returns with cash rent than with crop share because of the lower risk (e.g., move from point A to point B). Likewise, because of the increased risk associated with cash rent, a producer would want a higher return than with crop share (e.g., move from point B to

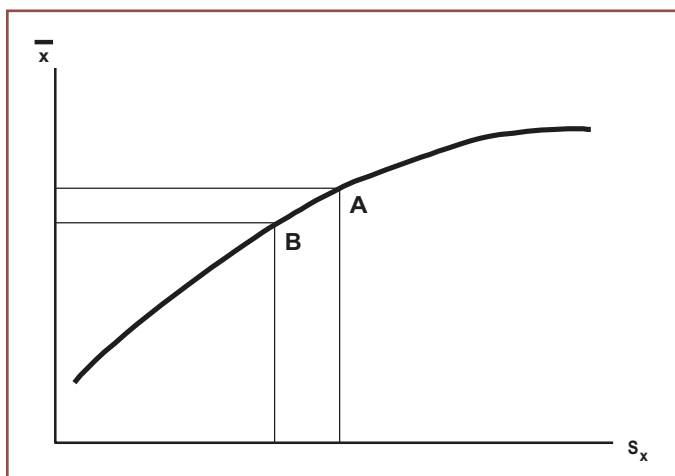


Figure 1.

point A). That means paying less with cash rent than with share rent. How much lower the cash rent might be will depend primarily upon the relative risk of the two options.

Producers should consider how much the variability in income (risk) might increase with cash renting compared to crop share renting.

### **Comparing Tenant’s Income from Crop Share vs. Cash Rent**

To examine income variability from renting on a cash versus a crop share basis, a model Texas High Plains cotton farm was developed from the FARM Assistance database. The FARM Assistance program is a computerized decision support system built on more than twenty years of research by Texas A&M University System agricultural economists. The computer model projects the financial situation of the agricultural operation for up to ten years into the future. This multi-year projection is a statistically based analysis. It uses the variability of past production on a farm-by-farm basis and combines that with the expert projections for crop and livestock prices, and inflation rates for inputs from the Food and Agricultural Policy Research Institute (FAPRI) and the Agricultural Food and Policy Center (AFPC) research teams. An analysis was performed for 2009-2018 period. It compares a standard  $\frac{1}{4}$  /  $\frac{3}{4}$  share lease agreement, in which the landlord shares the cost of fertilizer, insecticide, tech fees and defoliation, with a  $\frac{1}{5}$  /  $\frac{4}{5}$  lease where no expenses are shared by the landlord. A cash lease is set at a rate equivalent to the  $\frac{1}{4}$  share lease net of expenses at the APH yield.

The tenant’s returns were calculated for each year with the following rental arrangements: (1) typical crop share; (2) crop share with no shared inputs; and (3) cash rent equivalent. The first method was the  $\frac{1}{4}$  /  $\frac{3}{4}$  arrangement discussed above.

The second method was an equitable arrangement where no inputs are shared by the landowner. With this method, the tenant’s share of the income was determined to be 80 percent. This second method was considered because it represents an arrangement that shares risk but allows landowners not to share associated input costs.

The third method was a fixed cash rent equivalent to the average net crop share returns of the landowner (landowner’s  $\frac{1}{4}$  share of income less landowner’s shared expenses). No risk adjustment was considered; that would affect average returns but not income variability, so it’s not relevant for this analysis.

The analysis assumes that all acres are rented and that the producer does not make any changes in production (acres or costs) as the rental arrangement changes. Figure 2 shows the range of profit per acre for a given year to the tenant for each of the three rental arrangements considered. The annual variability of profit is considerably greater with the cash rent than with either of the crop share rental arrangements. As expected, the producer is better off with a cash rent in the good years but would prefer a crop share arrangement in the bad years.

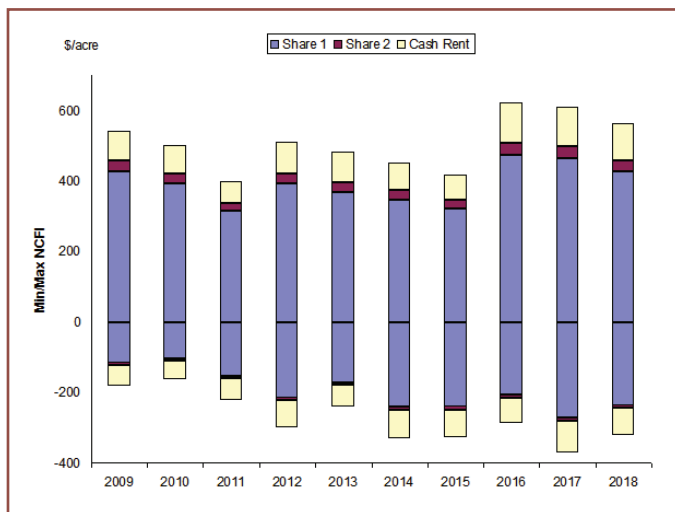


Figure 2.

The average variability of producer profit for the different rental arrangements over the ten-year period is shown in Fig. 3. In each year, variability, as measured by the standard deviation of income, increased about 33.3 percent by going from an equitable crop share arrangement (sharing some inputs) to a cash rent. This indicates that the risk to producers is substantially greater with a cash rent than with the “typical” crop share arrangement.

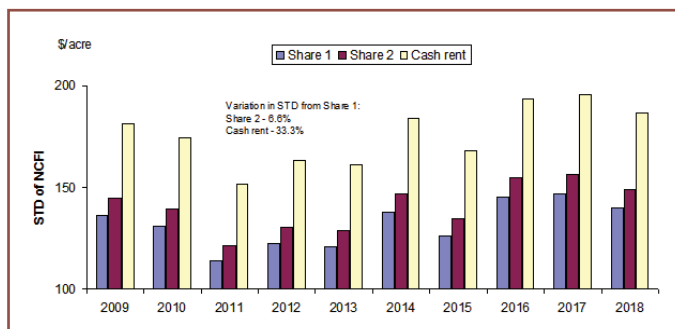


Figure 3.

The way to interpret a standard deviation is that returns would be expected to fall in the range of the average (mean) plus or minus one standard deviation 68 percent of the time, and between the mean  $\pm$  two standard deviations 95 percent of the time. In the arrangement where the landlord shares no expenses and receives 20 percent of the income (Share 2) the variability of income only increased 6.6 percent compared to 33.3 percent for the cash lease.

If producers switched to an equitable crop share arrangement with the landowners sharing no expenses (Share 2), income variability increased only 6.6 percent. Thus, if a landowner does not want to pay bills associated with the typical crop share arrangements, the producer may want to consider alternative crop share arrangements as opposed to switching to cash rents, unless there is an adequate “risk premium” factored into the cash rent.

### Risk Premium

A risk premium, or risk adjustment, represents a reduction in the cash rent relative to what is expected from a crop share arrangement, to account for the shift in risk from the landowner to the tenant. The amount of the risk adjustment is a function of an individual’s aversion to risk as well as the income variability. Since an individual’s aversion to risk is difficult to quantify, a recommended risk premium cannot be calculated.

It should be pointed out that risk premiums may not always be observed (i.e., cash rents might be equal to or greater than crop share rental equivalents). This might be the case if there is concern about the producer’s environmental stewardship, if the lease is short-term, or if the producer is not typical in the same way. If a landowner is concerned that a tenant will not maintain the quality of land with regard to fertility or weed control, the landowner may require a cash rent above what would be expected from a crop share arrangement. Producers wishing to spread fixed machinery and labor costs over more acres may bid cash rents up above an equilibrium long-term rate. However, because fixed costs will need to be paid in the long run, these higher cash rents cannot be sustained over long periods of time. Producers with above average production abilities (i.e., higher yields) or cost efficiencies (i.e., lower costs) may bid cash rents up relative to what the average producer can pay over the long run. Thus, there are legitimate reasons why cash rent risk premiums may not be observed in all cases. However, the reasons listed are exceptions and do not necessarily represent what we expect to observe in the long run.

## References

Kansas State University. Kansas Farm Management and Marketing Handbook, ed. L.N. Langemeier, October 1997.

Klose, Steven L. and Joe L. Outlaw. "Financial and Risk Management (FARM) Assistance: Decision Support for Agriculture." *Journal of Agriculture and Applied Economics*, 37,2 (August 2005):415-423

Klose, Steven L., Nicole Gueck, Joe L. Outlaw, DeDe Jones, Greg H. Kaase, Natalie A. Outlaw, Jeff Pate, Wade Polk, Patrick Warminski, Jay Yates, and A. Mac Young.

Texas Agricultural 2009: The Road to Success. Texas A&M AgriLife Extension Service, Department of Agricultural Economics, Texas A&M University System, FARM Assistance Annual Program Report, April 2009.

Langemeier, L.N. "Fixed and Flexible Cash Rental Arrangements for Your Farm." North Central Regional Extension Publication No. 75, February 1997.

Langemeier, L.N., M.L. Albright and F.D. DeLano. "Crop Lease Arrangements on Kansas Farm Management Association Farms." Kansas Agricultural Experiment Station, SRP 757, March 1996.

Partial funding support has been provided by the Texas Corn Producers, Texas Farm Bureau, and Cotton Inc.–Texas State Support Committee.

### **Texas A&M AgriLife Extension Service**

*AgriLifeExtension.tamu.edu*

More Extension publications can be found at *AgriLifeBookstore.org*

Educational programs of the Texas A&M AgriLife Extension Service are open to all people without regard to race, color, sex, disability, religion, age, or national origin.

The Texas A&M University System, U.S. Department of Agriculture, and the County Commissioners Courts of Texas Cooperating.

Produced by Texas A&M AgriLife Communications