

## DEPARTMENT OF AGRICULTURAL ECONOMICS

# Determining Cropland Cash Rental Arrangements

**Kevin C. Dhuyvetter and Terry L. Kastens**  
Extension Agricultural Economists,  
Kansas State University

**Joe L. Outlaw**  
Assistant Professor and Extension Economist  
The Texas A&M University System

Crop producers in Kansas and Texas rely heavily on rented land in their farming operations. In a survey of producers belonging to the Kansas Farm Management Associations, Langemeier, Albright, and DeLano found that nearly 90 percent of the operations used rented land in their 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 historically been the most common method of renting land in Kansas and Texas, the interest in cash rents has been increasing in recent years.

Because rented land is so important, the rental arrangements between landowners and producers can have significant impacts on the risk and returns of those operations. Thus, it is imperative that producers understand how rental arrangements affect their operations. For example, Langemeier, Albright, and DeLano found that in areas where cash renting is more common, land tends to change hands more often than in areas where land is rented on a crop share basis.

This publication focuses on cash rent leases and how they compare to crop share arrangements with regards to income variability. Related publications in this series focus on determining crop share rental arrangements and land values.

## Determining cash rent rates

Both landowners and tenants often request help in determining rental rates. Economic theory says that equilibrium rates occur where supply of land equates with the demand for land. Thus, the question arises, How do we arrive at an equilibrium price? Typically, landowners and tenants resort to some sort of negotiation and claim to want a cash lease rate that is fair to both parties.

Historically, cash renting has been much less common than renting on a crop share basis; however, recently the interest in cash rent has been increasing. A number of possible explanations arise: (1) increased planting flexibility, (2) landowners not wanting to share increased expenses associated with new

tillage/cropping systems/production technologies, (3) ever older landowners wanting fixed income, (4) increasing farm size and number of landowners per tenant, and (5) difficulty in prorating long run capital investments in certain technologies (e.g., precision agriculture).

In areas where there is sufficient cash renting, the prevailing cash rent market price provides an approximation of the appropriate measure of “fair” rent. However, in some situations there is no established rental rate or, if there is one, the rate has extenuating circumstances that preclude it from being appropriate (e.g., rate includes buildings or machinery, rent is between family members). In these cases, the following methods are typically used for determining a starting point for negotiation between the landowner and producer (Langemeier): (1) landowner’s cost, (2) amount tenant can afford to pay, and (3) crop share adjusted for risk.

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 (capital gains plus cash rent less real estate taxes) on his investment otherwise the land would be sold. 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 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.

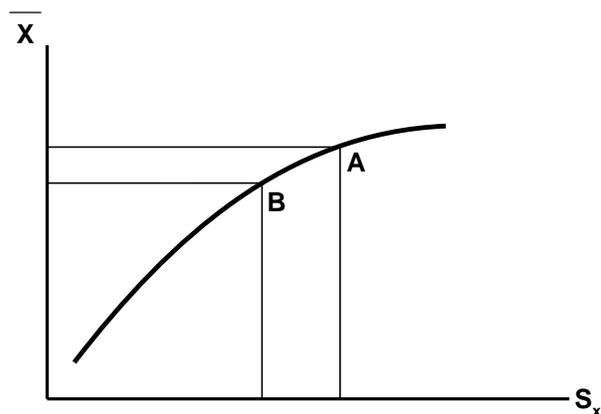
Because many landowners and tenants are familiar with crop share arrangements, using a crop share approach to determine a cash rental rate is practical. This approach determines the cash equivalent amount of an equitable crop share arrangement and then often makes a risk adjustment to that value. The 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 trade-off

With regards to any type of investment, the trade-off between risk and return is generally characterized as increased returns being associated with increased risk (Figure 1). Given this type of trade-off, it can be seen that in order to realize higher average returns ( $\bar{x}$ ), a person needs to 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 relative to 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 relative to crop share (e.g., move from point B to point A). Thus, a producer would want to pay less with cash rent compared to share rent. How much lower the cash rent might be, relative to crop share, will depend primarily upon the relative risk of the two.

It is important that producers consider the impact of moving from share to cash rent can have on the profitability and risk of their operations. Specifically, it is important to realize how much the variability in income might increase with cash renting compared to crop share renting.

Figure 1.



### Comparison of tenant’s income from crop share vs. cash rent

To examine income variability from renting on a cash versus crop share basis, 1987-1996 yield information was collected for farms in the north central (NC), southeast (SE), and southwest (SW) Kansas Farm Management Associations. Only farms having yields for wheat, milo, and soybeans for each year were considered for NC and SE and only farms having wheat and irrigated corn yields each year were considered for SW. Using these criteria, the number of farms considered were 24, 65, and 14 for NC, SE, and SW, respectively. A representative farm was developed based on the average number of acres for all the farms considered. The representative farms had the following crops and acres: NC - wheat (460), milo (211), and soybeans (141); SE - wheat (328), milo (243), and soybeans (374); SW - wheat (548), fallow (548), and irrigated corn (388).

Given the acreage mix of the representative farms and the actual yields of all farms considered, net income was generated for each farm for each year using average county prices, an average government payment, and 1997 costs for the region (KSU Farm Management and Marketing Handbook). Because yields trend up over time and this analysis is based on 1987-1996 actual yields, average returns over the ten year period were normalized to zero by adjusting yields up proportionally (increase of approximately 10 percent in all regions). This normalization of returns is also consistent with the general assumption that average profits equal zero in the long run.

Equitable crop share arrangements were calculated and compared to those typical in the region (Langemeier, Albright, and DeLano). The equitable

crop share arrangements determined were 1/3 - 2/3 with the landowner sharing fertilizer, insecticide, irrigation energy, and herbicides on spring crops and the tenant paying all other operating expenses.

The tenant's returns were calculated for each year with the following rental arrangements: (1) typical crop share, (2) cash rent equivalent, and (3) crop share with no shared inputs. The first method was the 1/3 - 2/3 arrangement discussed above. The second method was a fixed cash rent that was equivalent to the average net crop share returns of the landowner (landowner's 1/3 share of income less landowner's shared expenses). No risk adjustment was considered, as that would affect average returns but not income variability; and so is not relevant for this analysis. The third method was an equitable arrangement where no inputs are shared by the landowner. With this method the tenant's share of the income was 73.5, 74.8, and 77.9 percent for NC, SE, and SW, respectively. This third method was considered because it represents an arrangement that shares risk but is consistent with landowners who may not want to pay bills associated with sharing inputs.

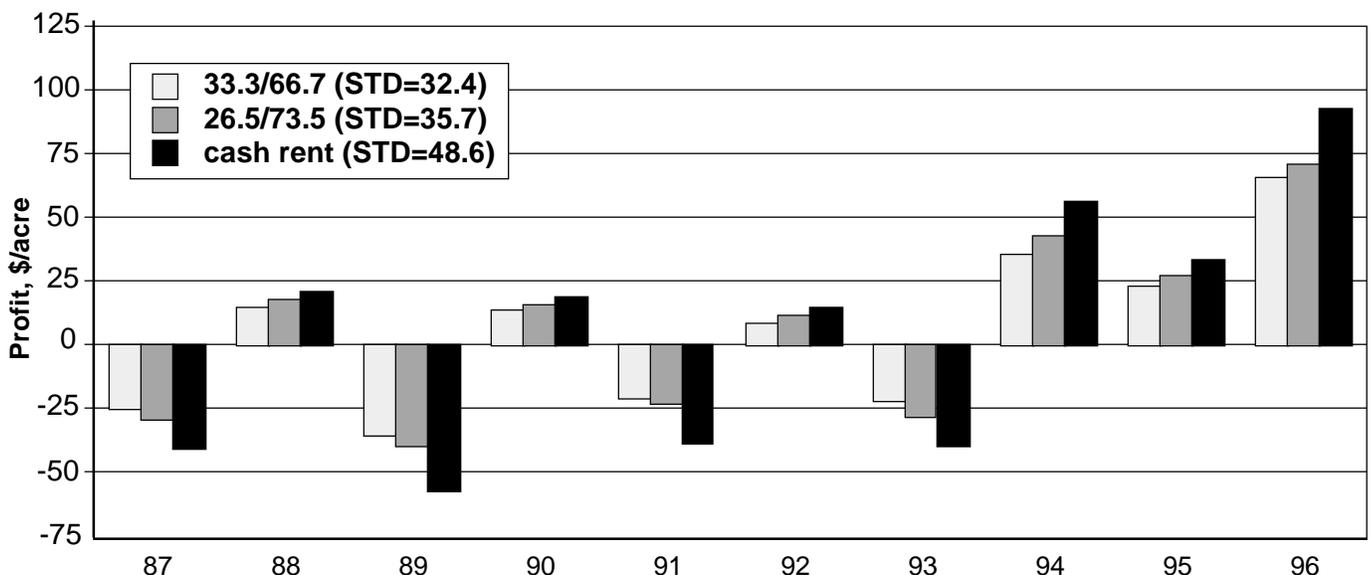
The analysis assumes that all acres are rented and that the producer does not make any changes in production (acres or costs) as the rental arrangement changes. Figure 2 shows the annual profit per acre to the tenant of one of the individual farms in NC Kansas for each of the three rental arrangements considered. The annual variability of profit is considerably greater with the cash rent than with either of the crop share rental arrange-

ments — average profits are equal for all methods. 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. Although not shown, similar patterns exist for the farms in SE and SW Kansas.

The average variability of producer profit for the different rental arrangements for the different regions is shown in figure 3. In all regions, variability, as measured by the standard deviation of income, increased about 50 percent by going from an equitable crop share arrangement sharing some inputs to a cash rent. This indicates that the risk to producers increases substantially with a cash rent compared to the "typical" crop share arrangement. The way to interpret a standard deviation is the following: 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 +/- two standard deviations 95 percent of the time. For example, in the NC region we would expect returns from a typical crop share arrangement to fall between -\$32.7 and +\$32.7 68 percent of the time, compared to -\$49 and +\$49 with a cash rent (the mean is zero for both methods because returns were normalized).

If producers switched to an equitable crop share arrangement with the landowners sharing no expenses (share #2), income variability increased only 10-17 percent. Thus, for landowners not wanting to pay bills associated with the typical crop share arrangements, producers may want to consider alternative crop share

Figure 2.



arrangements as opposed to switching to cash rents, unless there is an adequate “risk premium” factored into the cash rent.

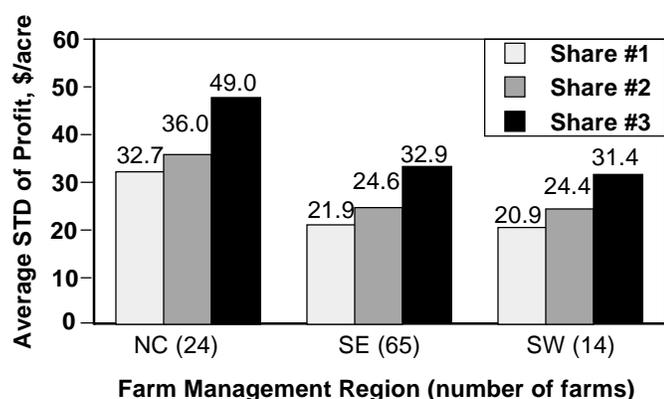
### Risk Premium

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. In working with landowners and producers in Kansas, a risk adjustment of 5 to 10 percent is typically suggested, which is generally understood and considered reasonable.

It should be pointed out that risk premiums may not always be observed (i.e., cash rents might be equal or greater than crop share cash equivalents). Possible reasons for this are: (1) environmental stewardship

concerns, (2) short-term lease, and (3) producers are not average. If a landowner is concerned that a tenant will not maintain the quality of land with regards 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 run rate. However, because fixed costs will need to be paid in the long run, these higher cash rents will not be able to be sustained over long periods of time. Producers that are above average in terms of 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.

Figure 3.



### References

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

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.

Brand names appearing in this publication are for product identification purposes only. No endorsement is intended, nor is criticism implied of similar products not mentioned.

Contents of this publication may be freely reproduced for educational purposes. All other rights reserved. In each case, credit Kevin Dhuyvetter, Terry Kastens, and Joe Outlaw, *Determining Cropland Cash Rental Agreements*, Kansas State University, February 1999.

### Kansas State University Agricultural Experiment Station and Cooperative Extension Service

It is the policy of Kansas State University Agricultural Experiment Station and Cooperative Extension Service that all persons shall have equal opportunity and access to its educational programs, services, activities, and materials without regard to race, color, religion, national origin, sex, age or disability. Kansas State University is an equal opportunity organization. Issued in furtherance of Cooperative Extension Work, Acts of May 8 and June 30, 1914, as amended. Kansas State University, County Extension Councils, Extension Districts, and United States Department of Agriculture Cooperating, Marc A. Johnson, Director.

February 1999