CONSERVATION RESERVE PROGRAM: RELATIONSHIPS BETWEEN AGRICULTURAL COMMODITY OUTPUT PRICES, INPUT COSTS, AND SLIPPAGE IN KANSAS

by

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Abstract

The Conservation Reserve Program (CRP) was established by the Food Security Act of 1985 for the purpose of retiring environmentally sensitive cropland for a period of ten to fifteen years. The initial focus of the program was to reduce on-site soil erosion and excess crop production, however the program benefits were later expanded to include water quality and wildlife habitat among others. The overall success of the CRP has been questioned due to the occurrence of slippage. The term ‘slippage’ as it relates to the CRP occurs when producers plant newly cultivated land or fallow acres, offsetting acreage that is retired through enrollment in the reserve program. The goal of this study is to measure the degree to which slippage has affected the CRP within the state of Kansas; and to analyze the relationship between agricultural commodity output prices and input cost with respect to county level slippage rates.

Annual slippage calculations for all one-hundred and five counties within Kansas for the period of 1995-2005 reveal significant spatial disparity, with the vast majority of slippage occurring in the western two-thirds of the state. Annual fluctuations in slippage rates varied both regionally and at the county level. Maximum annual slippage was seen in the northwest, with slippage rates in excess of 100 percent; thus the CRP was entirely ineffective in regards to reducing overall land in production. Minimums were located primarily in the southeast and included slippage values below zero percent; indicating a reduction in acreage beyond that of the CRP.

To analyze the relationship between agricultural commodity output prices and input costs with CRP slippage, a multivariate regression model was used. The regression analysis ultimately showed a significant lack of fit within the model, indicating the need for additional predictor variables in order to account for variations in CRP slippage rates. Although the model does indicate the presence of a minor relationship between the selected variables of agricultural commodity output prices and input costs with CRP slippage rates, further analysis is needed to identify additional county level variables impacting slippage.

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CHAPTER 1 - Introduction

Agricultural production in rural regions has long been a primary source of employment, driving rural economies, shaping their culture and values, and supporting urban populations. Government intervention in regard to agricultural production has also been a key force in rural areas. Although the catastrophe of the 'Dust Bowl' brought about the introduction of government programs for soil conservation, the agricultural practices that had contributed to the problem not only continued, but intensified. After the Second World War, the developed world began to undergo a dramatic change in the form of productivist agriculture. As defined by Woods (2005), the central aim of productivist agriculture was to increase agricultural production, which happened through intensification, concentration, and specialization. The "productivist" shifts led to the increased use of large machinery and agri-chemicals, larger farm units, and a decrease in employment availability for the 'generalist' farm-worker (Troughton 2005). In other words, large, often corporate, farms began to replace the 'traditional' (smaller, more diversified, and more household-based) farms in rural regions, with production demands driven by a world market economy and government supports. Productivism's central objective of increasing agricultural production was an unparalleled success, particularly through the changes that occurred in connection with what has become known as the Green Revolution, leading to an overabundance of agricultural goods that could not be sold at profit in the marketplace. Governments intervened, in part by purchasing crop surpluses in an attempt to guarantee stable income to farmers. These price supports eventually began to place a financial burden on society as a whole, however. Farmers who had been encouraged to borrow money for the purchase of large machinery and on-farm improvements found themselves struggling to make ends meet due to increased interest rates and periods of drought leading to low crop production (Dudley 2000, Woods 2005). This 'farm crisis' resulted in moderate shifts in the way that the productivist agricultural model was applied, as many producers began to see the need for more stable and sustainable agricultural practices. As indicators of environmental degradation such as soil erosion and decreased water quality became increasingly evident, the developed world began to realize that sustainable agriculture was not a luxury, but rather a necessity (Rasmussen et al. 1998).

Throughout the development of conservation programs in the United States, there has been variation in both program goals and levels of success. Early efforts, such as the Soil Bank Program (SBP) started in 1956, focused on land retirement for the purpose of decreasing crop production in an attempt to increase commodity output prices, as well as diminishing erosion problems. With much of the focus on production and price control, the SBP was not very successful at decreasing environmental degradation (Potter 1998). In the early years (1986-1990) of the Conservation Reserve Program (CRP), there was also criticism that the program was too focused on land retirement for decreasing production, with a focus on maximizing the acreage enrolled rather than only retiring those lands that would have the greatest environmental benefits. The 1990 Farm Bill furthered the objectives of the CRP to include additional environmental benefits, utilizing the Environmental Benefits Index (EBI) as a tool for targeting lands for retirement. Although a step in the right direction regarding the decrease of environmental degradation on agricultural lands, economic drivers such as high commodity output prices and increased world market demand may serve to decrease conservation program efficiency and effectiveness.

Purpose

As geographers, we have the ability to perform spatial analysis at varying scales. The very nature of our work deals with identifying relationships. These are both skill sets that should prove invaluable in exploring the interconnected workings of human-environment interactions in rural areas. As noted by Woods (2005), environmental change in rural areas, including the degradation of the environment by modern agriculture and the encroachment of urban areas, is of growing interest to rural geographers concerned with land use issues. Geographers are well equipped to deal with the complexities of rurality, rural change, and rural governance (Cloke 1996).

This paper attempts to address concerns regarding a specific example of rural policy, namely the effectiveness of the CRP as a program for land retirement and those factors that alter program efficiency. Within the past decade there has been considerable geographical research pertaining to government agricultural policies such as the CRP and Conservation Reserve Enhancement Program (CREP) (Leathers and Harrington 2000, Wu 2000, Lant et al. 2001, Yang et al. 2005), as well as more general considerations of the geographies of agricultural legislation (Dixon and Hapke 2003). In short, the discipline of geography is well established in the study of rural human-environment interactions and the associated policy decision making implications.

This study will further previous research (Leathers and Harrington 2000, Wu 2000) by applying the methods used for slippage calculation to the near-present – as close to the present as data availability allows – and attempting to identify those factors which contribute to change in CRP slippage.

Problem Statement and Objectives

The term "slippage" as it relates to the CRP occurs when producers plant newly cultivated land or fallow acres, offsetting acreage that is retired through enrollment in the reserve program. Previous studies regarding slippage (Ericksen and Collins 1985, Leathers and Harrington 2000, Wu 2000) indicated two major possibilities of factors contributing to slippage. The first factor is substitution and the second is output price increase. Slippage due to substitution occurs when farmers with land enrolled in the CRP break previously uncultivated or fallow land in an attempt to make up the difference in cropped acreage. The Sodbuster and Swampbuster provisions were included in the Food Security Act of 1985 as an attempt to curb this practice, but enforcement problems have hampered their effectiveness (Wu 2000). Output price increase refers to the increase in slippage due to higher commodity output prices, and can result in farmers without enrolled land tilling previously uncropped areas. Higher output prices for agricultural commodities could be caused by the decrease in output (quantity supplied) associated with decreased production on CRP land or through increased market demand for agricultural outputs.

According to Wu (2000), if substitution is the major factor causing slippage, then preventing slippage could be accomplished by focusing on participating farmers. However, if output price increases are the major contributing factor, a focus on participant farmers would not be sufficient. Leathers and Harrington (2000) and Wu (2000) recognized the need for further temporal research regarding the magnitude of price related slippage. These studies also noted the negative impacts of government agricultural subsidies on conservation programs. As a follow-up, my research attempts to address the question: "Is there a relationship between fluctuations in agricultural commodity output prices, input costs and Conservation Reserve Program slippage rates in Kansas?" The following tasks were accomplished to address this question:

1) Determination of the annual slippage rates for each county in Kansas between 1995 and 2005, using agricultural statistics at the county level.
2) Refinement of the study area by excluding those counties with a negative average annual slippage value for the study period (1995-2005).
3) Collection of annual grain crop output prices, input costs and land values in Kansas between 1995 and 2005, using agricultural statistics at the district and regional levels.
4) Completion of statistical analyses to determine the strength of relationships between annual CRP slippage rates, agricultural commodity output prices and production costs.

Justification

The initial focus of the CRP was to reduce on-site soil erosion and excess crop production, while positively affecting commodity prices. The goal was to establish conservation reserves totaling 40 to 45 million acres by the year 1990 (CES 1995). As of October 2008, Kansas had approximately 3.1 million acres of land enrolled in the CRP, bringing in $123.3 million in federal monies annually (FSA 2008). Considering the large amount of taxpayer funding spent on the program, any effort to better understand those factors that have a negative and/or positive impact on program benefits and efficiency is well justified and may aid further policy development.

Studies (Skold 1989, Riddel and Skold 1997) have indicated that cropland retirement policies such as the CRP have a minimal impact in terms of reduction in acreage of harvested cropland and even less effect on reducing production amounts. The latter may be due to an increase in per acre output or the fact that it is generally lower productivity land that is taken out of production, a side effect of retiring the most environmentally sensitive cropland that would be difficult to overcome. However inefficient the CRP may be in reducing excess crop production or increasing commodity prices, there are many studies (Cunningham 2005, Gray and Teels 2006, Lovell and Sullivan 2006) that extol the program benefits in terms of the decrease in environmental degradation and increase in wildlife habitat. The purpose of this research is not to refute the site-specific environmental benefits of land retired through the CRP, but rather to determine those factors that decrease the overall efficiency of the program in achieving these benefits at a larger scale. Such information can help in future development and increased effectiveness of government conservation and land retirement programs.

Slippage calculations alone are a general indicator of the efficiency of the CRP in reducing the amount of land that is in crop production. These calculations do not take into account the unique benefits of individual parcels of land. However, placing previously uncultivated or idle acreage into crop production (slippage) has a negative impact to some extent, no matter what the land's EBI score (Gilley and Doran 1997). Therefore, identifying those factors that increase or decrease slippage rates can help to guide program decision making and increase the overall benefit to cost ratio of the CRP.

CHAPTER 2 - Background

Conservation Programs Development

The largest 'payment for conservation' programs can be divided into two groups based on their general approach. Land retirement programs remove land from production (generally cropland); working-land programs provide assistance to producers who maintain conservation practices on land in production. The following focuses on the development of land retirement programs.

Commodity price supports have been a mainstay in agricultural legislation since the farm depression of the 1920s and have included acreage reduction programs in some form since the Agricultural Adjustment Act (AAA) of 1933. Established as part of a New Deal agricultural policy, the focus of the AAA was the reduction of production by means of controlling crop acreages on individual farms (Hill 2003). Under the AAA, producers who complied with the approved reduction in crop acreage on their farm received a benefit payment. Issues regarding the funding source for the program led to the Supreme Court declaring the AAA unconstitutional in 1936. The Soil Conservation and Domestic Allotment Act of 1936 was passed as emergency legislation in response to this, shifting the focus of the overall program to income protection and resource conservation (Cochrane and Runge 1992). It is not surprising, given the timing of this legislation in relation to the 'Dust Bowl' era, that the resource conservation portion of this Act involved paying farmers to take acreage out of traditional row crop production and plant those acres to legumes and grasses.

Although agricultural legislation varied in terms of method, price supports in some form remained a constant throughout the 1940s. Levels of price support were minimally decreased in the early 1950s, but the combination of productivist agriculture leading to increased farm output and already mounting government grain stocks resulted in a large surplus (Bottum 1957). In an attempt to combat the growing surplus problem, the concept of the 'soil bank' was developed.

The Soil Bank Program (SBP), enacted in the Agricultural Act of 1956, consisted of two main parts. First, the Acreage Reduction Program (ARP) portion paid producers for enrolling acreage on which no crop would be harvested or cattle grazed. Between 1956 and 1958, approximately 21 million acres were 'banked' through the ARP (Cochrane and Runge 1992). The second part of the SBP was the first Conservation Reserve Program, which is often referred to simply as the Soil Bank. This portion of the SBP paid producers for shifting below-average cropland into long-range conservation uses. Producers voluntarily enrolling in the three to ten-year land retirement program were required to maintain conservation cover on the land taken out of production, but producers were allowed to choose the sections of land that they enrolled in the Soil Bank under the SBP. Enrollment in the Soil Bank reached 28.6 million acres in 1960 with the last of the enrolled acres coming out of the program in 1972 (Cochrane and Runge 1992). The ARP was stopped in 1958 and contracts under the Soil Bank were not actively pursued after 1959. According to Cochrane and Runge (1992), the reasons for abandoning the two programs were the high cost of removing crop acres from production, the negative impact on rural areas from the provision that permitted whole farms to be taken out of production, and the lack of success in reducing total farm output.

A new version of the CRP was established by the Food Security Act of 1985 for the purpose of retiring environmentally sensitive cropland for a period of ten to fifteen years. The initial focus of the program was to reduce on-site soil erosion and excess crop production. Throughout the early years of the program (1985-1990), concerns were expressed regarding the maximization of acreage as opposed to the targeting of land based on benefit-to-cost ratios. In other words, the focus was on retiring as much land from production as possible rather than enrolling those properties that would result in the greatest environmental benefit from retirement. In response, the 1990 Farm Bill extended the objectives of the CRP to include on-farm and off-farm environmental benefits. The targeting mechanism introduced by the U.S. Department of Agriculture was the Environmental Benefits Index (EBI) (Yang et al. 2005). Surface water quality, groundwater quality, soil productivity, conservation compliance assistance, tree planting, acreage in critical watersheds, and acreage in conservation priority areas were equally weighted indicators of the EBI (Smith 2000). In addition to the utilization of the EBI, rental payments were restricted to an estimate for comparable cropland after adjusting for soil productivity (Yang et al. 2005). The EBI was redefined as part of the 2002 Farm Bill to include wildlife benefits, water quality benefits derived from reduced erosion, runoff and leaching, on-farm benefits of reduced erosion, enduring benefits, and air quality benefits from reduced wind erosion (FSA 2003a)(Table 2.1).

Table 2.1 The Most Common & Highest Scoring Practices for CRP's EBI (Classen et al. 2008)

EBI Factors	Definition	Features that Increase Points	Maximum Points
Wildlife	Evaluates the expected wildlife benefits of the offer	▪ Diversity of grass/legumes ▪ Use of native grasses ▪ Tree planting ▪ Wetlands restoration ▪ Beneficial to threatened/endangered species ▪ Complements wetland habitat	100
Water Quality	Evaluates the potential surface and ground water impacts	▪ Located in ground- or surface-water protection area ▪ Potential for percolation of chemicals and the local population using groundwater ▪ Potential for runoff to reach surface water and the county population	100
Erosion	Evaluates soil erodibility	▪ Larger field-average erodibility index	100
Enduring Benefits	Evaluates the likelihood for practice to remain	▪ Tree cover ▪ Wetland restoration	50
Air Quality	Evaluates gains from reduced dust	▪ Potential for dust to affect people ▪ Soil vulnerability to wind erosion ▪ Carbon Sequestration	45
Cost	Evaluates cost of parcel	▪ Lower CRP rent ▪ No government cost share ▪ Payment is below program's maximum acceptable for area and soil type	Varies

According to Yang et al. (2005), research assessing the CRP indicated that the shift to the EBI was helpful in increasing the cost effectiveness of the program. However, alternate studies (Leathers and Harrington 2000, Wu 2000) analyzing slippage were not as optimistic regarding the effectiveness of the CRP, especially regarding the decrease of soil erosion.

Slippage

The phenomenon of "slippage," as it relates to agricultural acreage reduction programs, can be traced back to early appraisals of the AAA in the 1930s. As noted by Cochrane and Runge (1992), agricultural producers in the 1930s found ways around the crop-specific production control programs by renting acreage to the government then planting non-controlled crops on the acreage which resulted in little to no actual reduction in production. Although acreage reduction programs have changed significantly since the AAA, the concept of slippage remains a useful tool for estimating program effectiveness.

There are two main types of slippage that can be analyzed when considering land retirement programs: acreage slippage and yield slippage. Acreage slippage compares the total amount of acreage removed from production under the retirement program to the amount of land in production post-retirement and can be calculated in terms of total acreage in production or for specific crops. Yield slippage refers to the quantity of commodities produced post-retirement of program lands in comparison to quantities prior to program enrollment. Because the main intent of the AAA programs during the 1930s was to reduce production through the control of crop acreages, yield slippage was a good indicator of program effectiveness (Cochrane and Runge 1992). However, given the multiple-objectives of the current CRP, acreage slippage allows for a more holistic analysis of overall program success and is the focus of this paper.

The occurrence of acreage slippage takes place when agricultural producers plant either newly cultivated land or previously fallow fields, offsetting the acreage retired under the program. These producers may or may not be participants in the CRP: acreage slippage may occur either with substitution (of uncropped area for the acreage enrolled in a retirement program) or with non-enrolled farmers who expand their cultivated land (perhaps in response to an increase in output prices). In the case of those who have land enrolled in the CRP, money saved on input costs by not cultivating the retired land combined with the CRP rental payment may afford them the ability to cultivate previously idle, less productive land. In this case, so long as the property had been previously cultivated and a conservation plan developed, Farm Bill provisions provide no means of penalty for these actions. Producers without land enrolled in the CRP may begin to cultivate new ground or less productive fields in anticipation of higher commodity output prices that may result from a reduction in area production due to land retirement. Producers involved in other government programs, such as crop insurance or farm loans, they still required to have a conservation plan in place if the land is considered highly erodible. They also are forbidden from plowing up previously uncultivated grasslands under the Conservation Compliance and Sodbuster provisions of the 1985 Farm Bill. However, those producers not involved in government programs are able to cultivate any and all land under their control because the penalties associated with Farm Bill provisions are limited to the denial of access to all federal agriculture assistance programs.

Ideally, the number of acres in production would be directly reduced by the number of acres retired under the CRP. In reality, acreage reduction programs generally only reduce total crop acreage by a percentage of that which is removed from production by program enrollment (Ericksen and Collins 1985). The resulting offset due to increased plantings on unrestricted acres is slippage and is measured as a factor from zero to one. A slippage factor of zero indicates that for every acre removed from production, total acreage in production is reduced by one acre. In other words, program retirements have been completely effective. Likewise, a slippage factor of one means that total production was not at all reduced by the program acreage being removed from production.

Economic Impacts of CRP

The concept of equity among producers enrolling land in the CRP has been a major issue. The broad problem arose from a uniform bid cap within a region where individual parcel productivity may greatly differ. The results were a greater burden on those producers with highly productive land who wished to enroll a portion of their land in the CRP than those enrolling less productive land in the program (Young et al. 1991). Revisions in the 2002 Farm Bill addressed these concerns by setting bid maximums based on county-level average cropland rental rates and adjusting these rates for field-specific productivity.

Although there is a 25 percent cap on the amount of land that can be enrolled in the CRP within each county, the impact on the local economy from taking this land out of agricultural production is still an issue of concern. As noted by Martin et al. (1988), "while individual farmers may benefit from participation, there may be [a] net adverse impact on the community if the retired land is relatively productive or if the inputs that are no longer purchased would have been purchased locally". The negative impacts on the local economy can be further compounded if the monetary CRP benefits are going to a landowner who no longer resides in the area (Martin et al. 1988). Revisions within the 2008 Farm Bill address this issue by giving preference to locally-residing producers over absentee landowners for program enrollment, all other criteria being equal. In rural areas where the CRP reaches the 25 percent per county enrollment level, the local decrease in demand for farm inputs can have a major impact. Couple this with commonly occurring depopulation of these areas, and it is even more challenging for local suppliers to stay in business.

Enrollment in the CRP does affect the supply of agricultural commodities, making it a useful tool for the reduction of excess crop production (Taff 1990). However, this would only hold true for those counties where any reduction in crop production is not offset by slippage. In turn, the decrease in commodity supply may increase commodity prices, adjusting the relationship between potential production income from the land and income gained through enrollment in the CRP. This can lead to increased slippage in regard to the program and decreased re-enrollment upon completion of program contracts.

As previously mentioned, the CRP was criticized early on for attempting to maximize acreage enrolled in the program. Although Congress mandated that the CRP be run as an auction with the hopes that this would provide incentive for landowners to submit bid prices that reflected the land's true rental values, difficulties with the initial implementation of the program (1985-1990) transformed it into an "offer system" where anyone with eligible land could enroll and be paid at the bid cap price (Smith 1995). This raised some questions regarding the size of the CRP relative to the amount that was being spent on the program. Essentially, what critics were saying is that with this method, the costs of the program outweighed the benefits (marginal cost was higher than marginal benefit). In an attempt to decrease marginal cost relative to marginal benefit, rather than decrease the size of the program, determination of land eligibility for enrollment in the CRP was based on the Environmental Benefits Index and program payments were based on an estimate of production capability on the enrolled lands.

Land enrolled in the CRP is privately owned; however, with enrollment in the program comes certain rules and regulations regarding the use of not only the land enrolled, but also all other land owned by the agricultural producer. The Sodbuster, Swampbuster, and Conservation Compliance provisions included in the Food Security Act of 1985 require that no previously uncultivated ground is put into production and that all land in production meets appropriate conservation practices. Failure to comply with these provisions can result in the loss of eligibility for certain farm program benefits if it is determined that the producer was not acting in 'good faith'. This would seem to be a large enough penalty to deter violation of the rules. However, confirmation of compliance with these provisions has proven difficult, given the vast spatial extent of CRP lands (Wu 2000). Increasing agricultural commodity prices also provide economic incentive for the violation of these provisions.

Assuming that slippage does not surpass the benefits of the program, agricultural land retirement through the CRP reduces the external costs of farming. These externalities occur where producers do not incur the full cost of their actions. Examples of externalities associated with agricultural production include soil erosion and fertilizer runoff which pollute both surface water and groundwater, emissions from the use of fossil fuels for production purposes, the release of carbon from tilling the soil which leads to air pollution, and in certain areas substantial depletion of groundwater supply through irrigation. Removing land from production effectively reduces these externalities.

Because producer decisions to enroll in the CRP may cause the price of agricultural commodities to increase, due to a decrease in production and available quantities, it can also be said that the program has an external economy for other producers. External benefits may exist in the form of decreased pollution for those downstream from land enrolled in the CRP. Again, as long as the environmental benefits gained from those lands enrolled in the CRP are not offset by slippage, the improved water quality could be considered an external benefit for those downstream from the property.

With increasing prices of agricultural commodities and many CRP contracts set to expire, a major issue with current CRP policy is that of rental rates and the extension of CRP land contracts. A study (Cooper and Osborn 1998) conducted around the time of the last large contract expiration found that, given the then-current averages for CRP rental payments, only 50 percent of enrolled landowners would be likely to extend their contracts. Given such indications, it will be interesting to see what impact recent commodity prices will have on landowner decisions to re-enroll in the CRP. The ability to profit additionally from the harvest of biomass for biofuel production on CRP land and permitted haying or grazing (with payment reductions as outlined in the 2008 Farm Bill) may play a crucial role in these decisions.

CHAPTER 3 - Study Area

According to the Kansas Energy Plan (2007), approximately 94 percent (49.2 million acres) of Kansas land is used for agricultural production and wildlife habitat. As calculated from crop statistics reported by the National Agricultural Statistics Service (NASS), row crop production accounts for approximately 20.8 million of these acres (1995-2005 average). In comparison to this, the 3.1 million acres of land currently enrolled in the CRP within the state seems rather minuscule. However, as the largest cropland retirement program to date, those acres retired under the CRP are a crucial part of ongoing attempts to decrease the environmental degradation that results from agricultural production on marginally suitable lands. Kansas has the third highest total acreage enrolled in the CRP, slightly trailing Montana (3.2 million acres) and Texas (3.8 million acres) (FSA 2009). Although it may rank third in total acreage, when enrolled acreage is considered with respect to total land area among these three states, Kansas comes out on top with approximately 5.9 percent of total land area enrolled in the CRP (Montana 3.4 percent; Texas 2.3 percent).

The state of Kansas represents an area with a high degree of spatial variability in crop production, and methods of production, due to a spatially disparate precipitation pattern, regional differences in access to and need for irrigation, and heavily weighted population centers within the eastern third of the state that results in differing land ownership patterns. Given the state's emphasis on agricultural production, the regional variability in production, and the large acreage enrolled in the CRP, Kansas lends itself well to the analysis of CRP slippage and the determinants thereof.

Agriculture in Kansas

There are four main crops under production within the state of Kansas: wheat, sorghum, corn, and soybeans. Wheat accounts for approximately 50.25 percent of total row crop planting within the state (percentages based on total planted acreage averages from 1995-2005). Regionally, wheat is fairly evenly dispersed throughout the western two-thirds of the state, with some notable concentrations in the south-central area (Figure 3.1). Sorghum is the second most common crop, representing approximately 17.2 percent of total row crop planting. As with wheat, sorghum is common throughout Kansas, but is more concentrated in the south-central, north-central and southwestern portions of the state (Figure 3.2). Corn is slightly less common than sorghum, at 14.5 percent of total crop acreage. Corn is also less spatially dispersed than wheat and sorghum, with large concentrations of planted corn in the southwestern and northwestern areas and some minor concentration in the extreme northeast (Figure 3.3). Soybeans are approximately 12.5 percent of total planted row crops. As seen in Figure 3.4, soybeans are primarily grown in the eastern one-third of the state, an area with lower numbers of the top three grain crops in comparison to the rest of the state. This is due primarily to calcareous soils in the central and western portions of the state and the common resulting problem of iron chlorosis in soybeans (AESCES 1997). Alternative crops such as sunflowers, upland cotton, and dry edible beans make-up the remaining 5.5 percent of total crops.

Figure 3.1 Wheat: Average Planted Acreage as a Proportion of State Total (1995-2005)

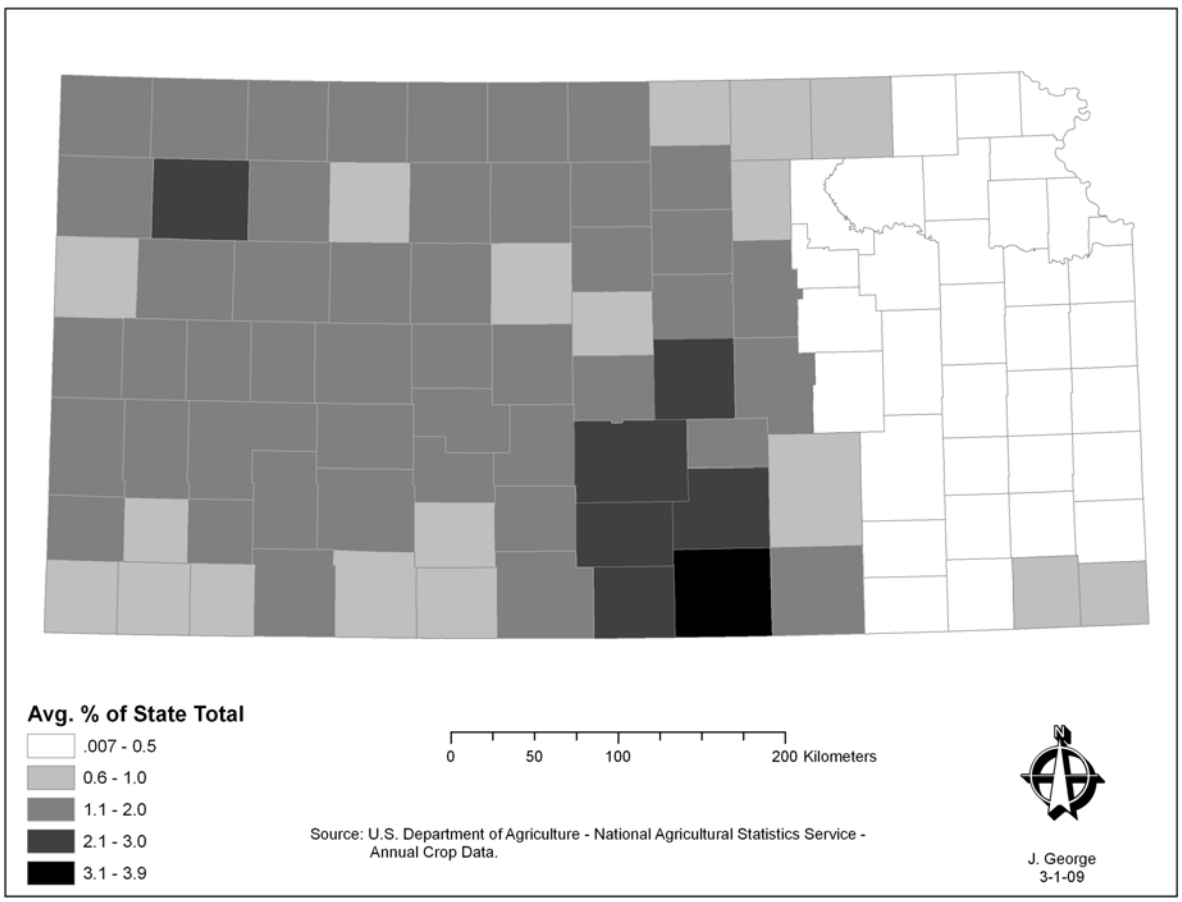


Figure 3.2 Sorghum: Average Planted Acreage as a Proportion of State Total (1995-2005)

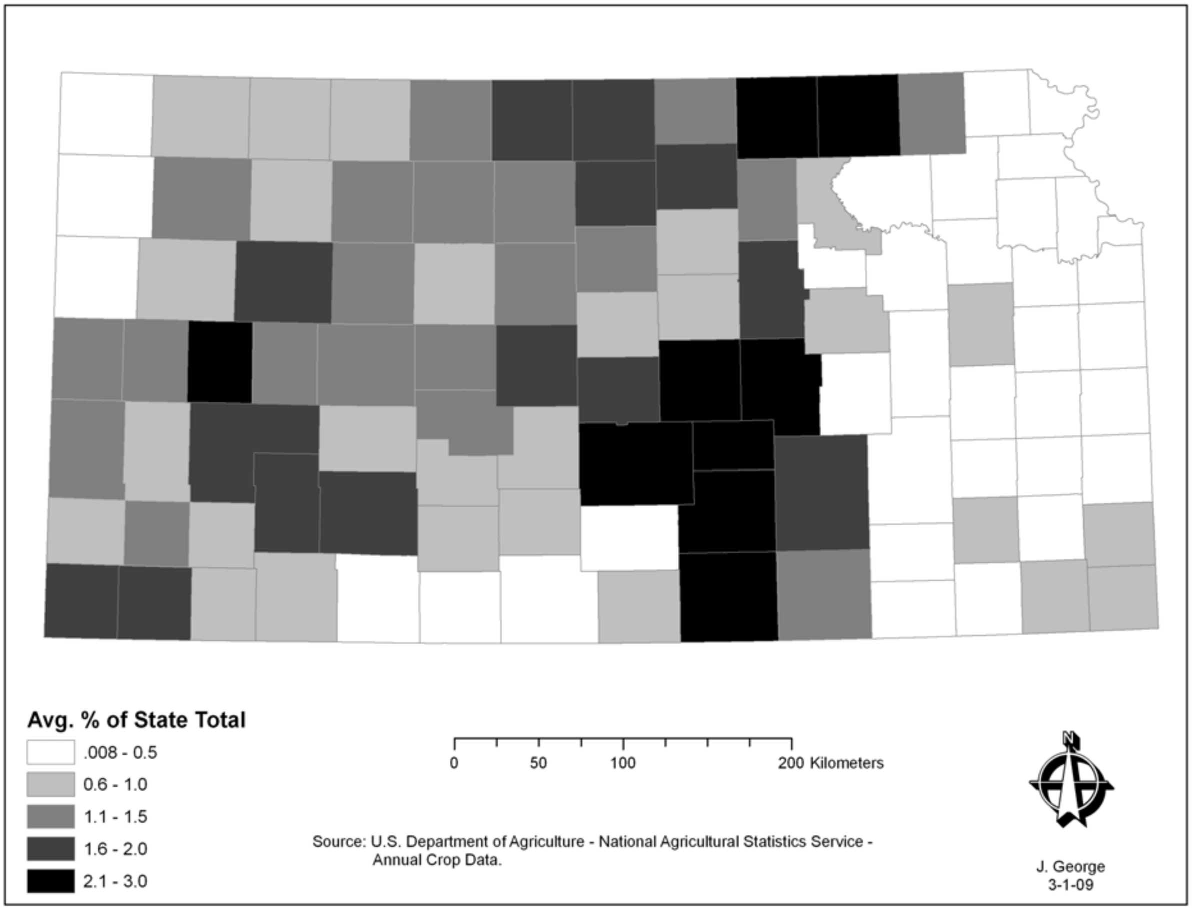


Figure 3.3 Corn: Average Planted Acreage as a Proportion of State Total (1995-2005)

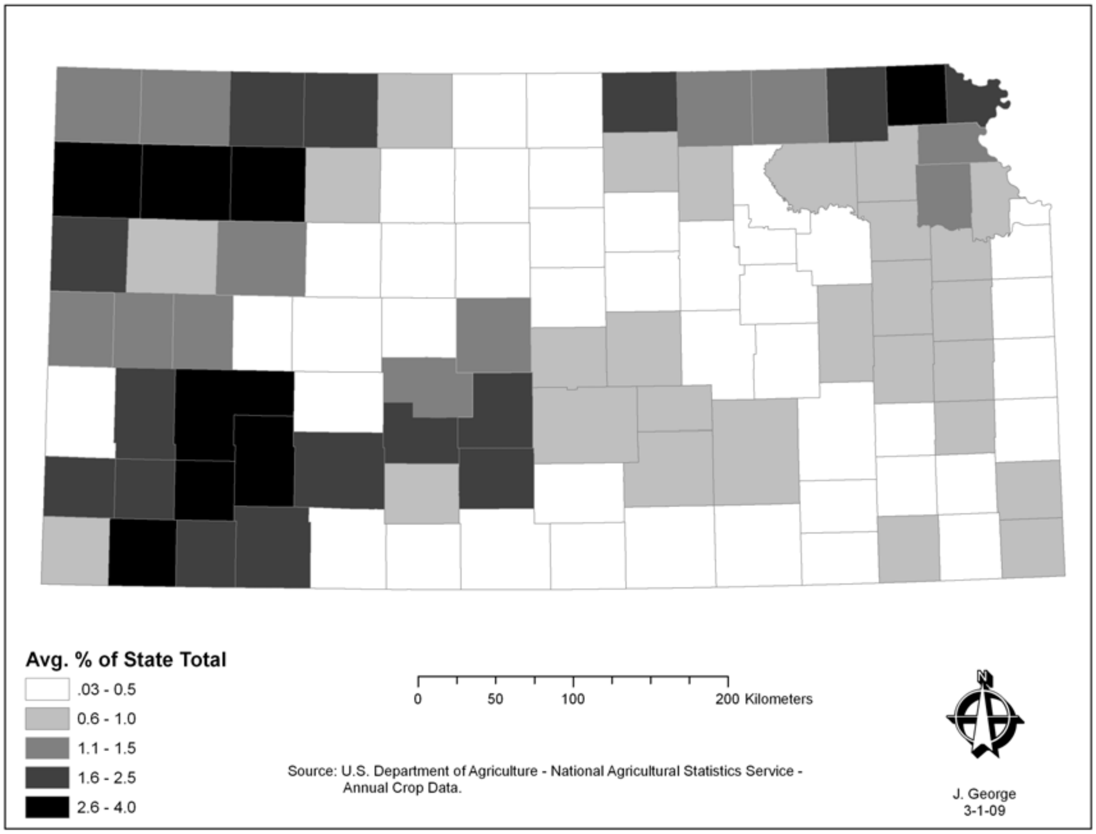
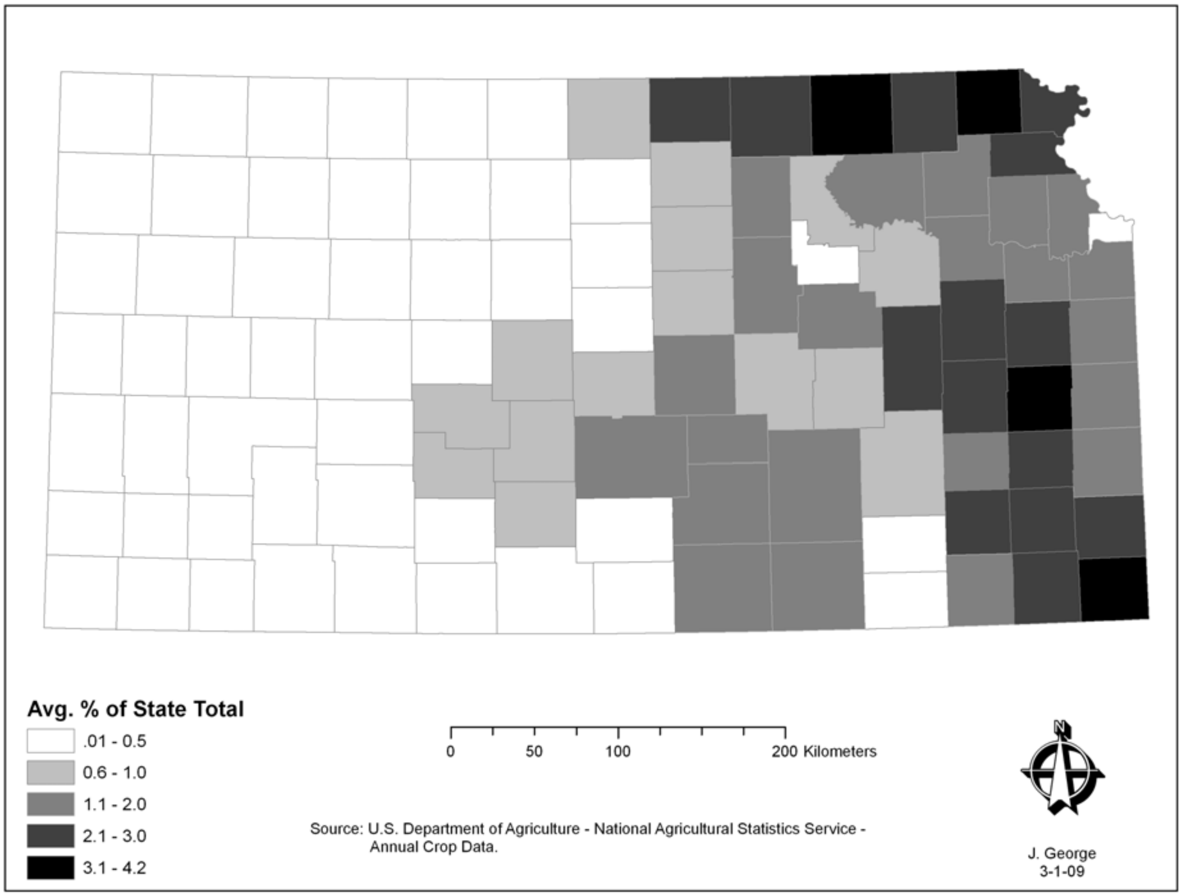


Figure 3.4 Soybeans: Average Planted Acreage as a Proportion of State Total (1995-2005)



Annual precipitation varies across the state, decreasing in an east-to-west gradient (Figure 3.5). Not surprisingly, the use of irrigation reflects the lack of rainfall in the western two-thirds of the state and is compounded in the southwestern region by the concentrated planting of corn, a crop with a high requisite for water (Figure 3.6). The primary source of water for irrigation in this High Plains area is the vast Ogallala Aquifer. The availability of affordable technology to tap this resource after World War II (Kromm and White 1992) changed this portion of the state from a drought stricken area of low production to one of the most agriculturally productive areas in the state (Peterson et al. 2003). Unfortunately, the high use and slow recharge of aquifer waters has led to dramatic decreases in the level of the water table and there are now areas where it is no longer economically feasible to access the water for irrigating crops.

Figure 3.5 Precipitation: Normal County Annual Totals

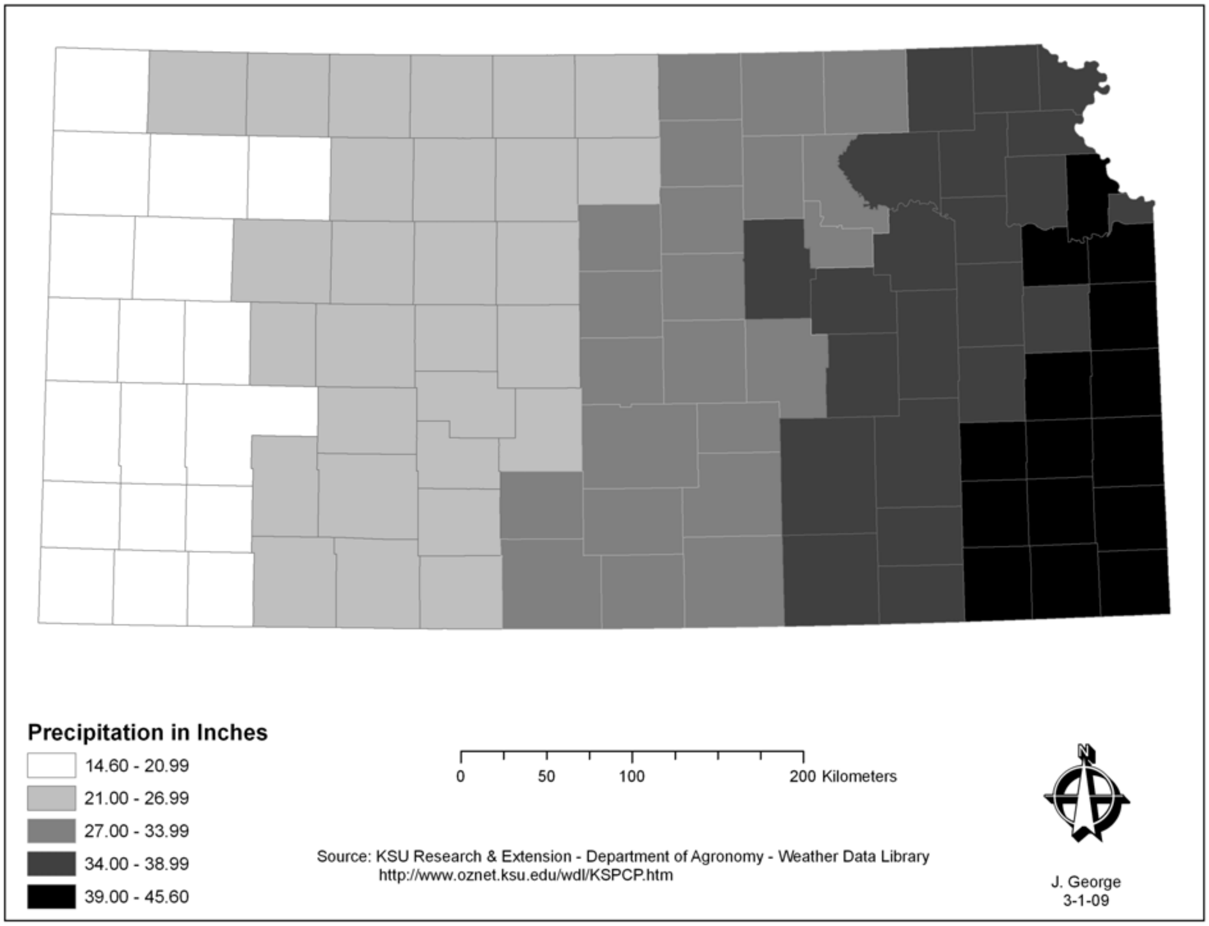
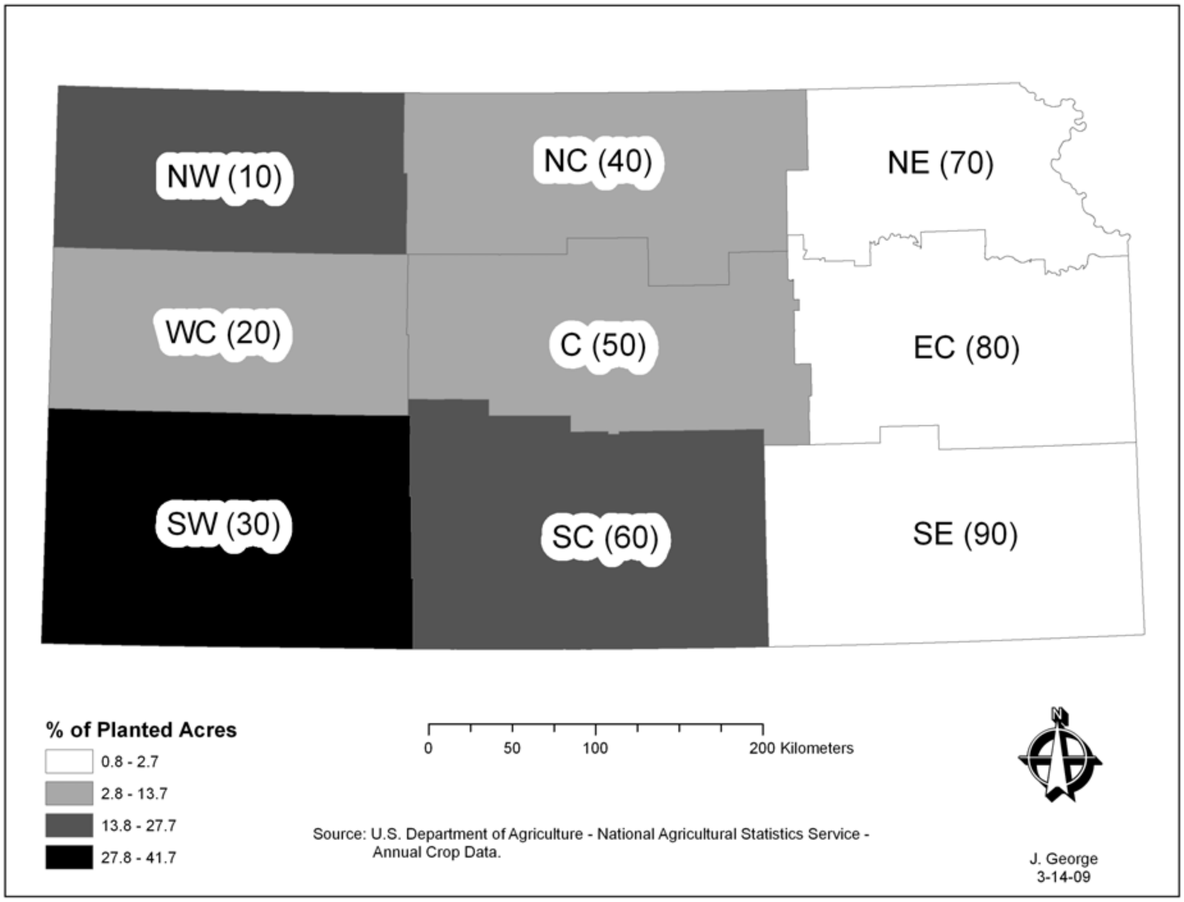


Figure 3.6 Agricultural Statistics Districts: Irrigated Cropland Average (1995-2005)



Population densities in eastern Kansas are much higher than the rest of the state. Historically, large settlements within the state were located along the Kansas River, its tributaries, and the Arkansas River (Self and White 1986). The combination of a high population density and less open terrain has resulted in smaller farm units in the eastern third of the state. In comparison, the wide-open expanses of the high plains region in the west has lent itself well to the development of very large, often corporate, farms.

Conservation Reserve Program in Kansas

Total enrollment in the CRP varied throughout the study period (1995-2005), with lows of approximately 2.5 million in 1999 and 2000 (Figure 3.7). Of the 3.1 million acres in Kansas that are currently enrolled in the CRP, approximately 2.6 million acres are located in the western two-thirds of the state (Figure 3.8). Interestingly, despite the large spatial difference in contracted acreage, the number of CRP contracts is fairly evenly distributed throughout the state. The reason for the spatially disparate CRP acreage is a combination of land ownership patterns, terrain, soil types, and the conservation practices that are most widely used in different regions of the state. Many CRP practices in the eastern portion of the state enroll buffers and filter strips rather than the large expanses of grassland that are seen in central and western Kansas.

Figure 3.7 Total Annual CRP Enrollment in Kansas (1995-2005)

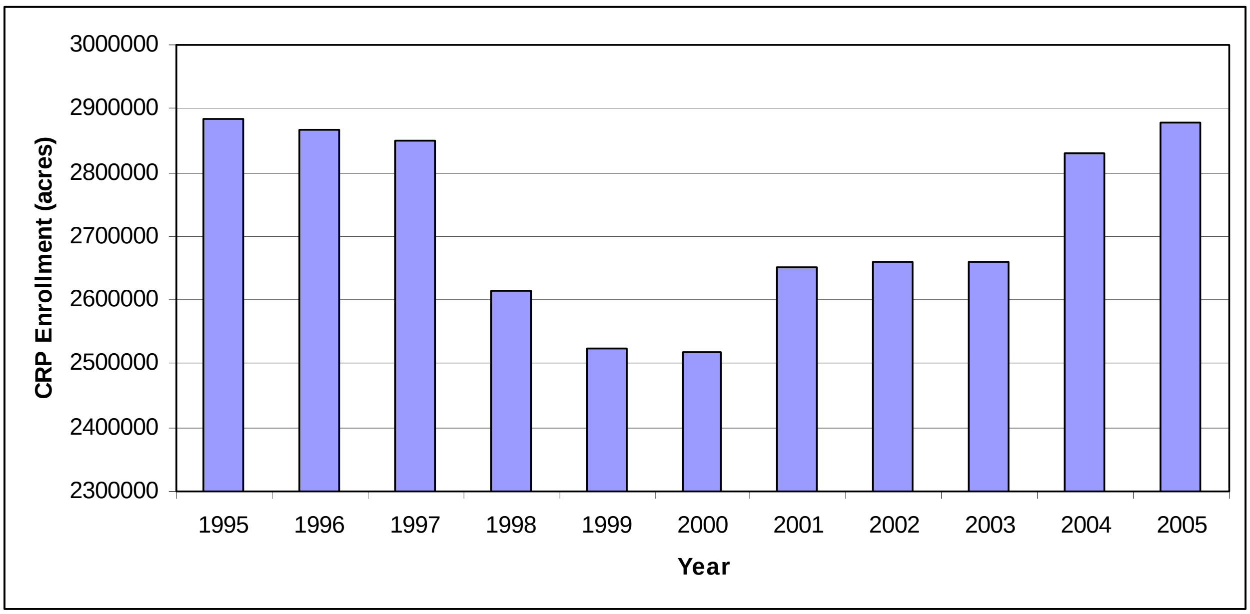
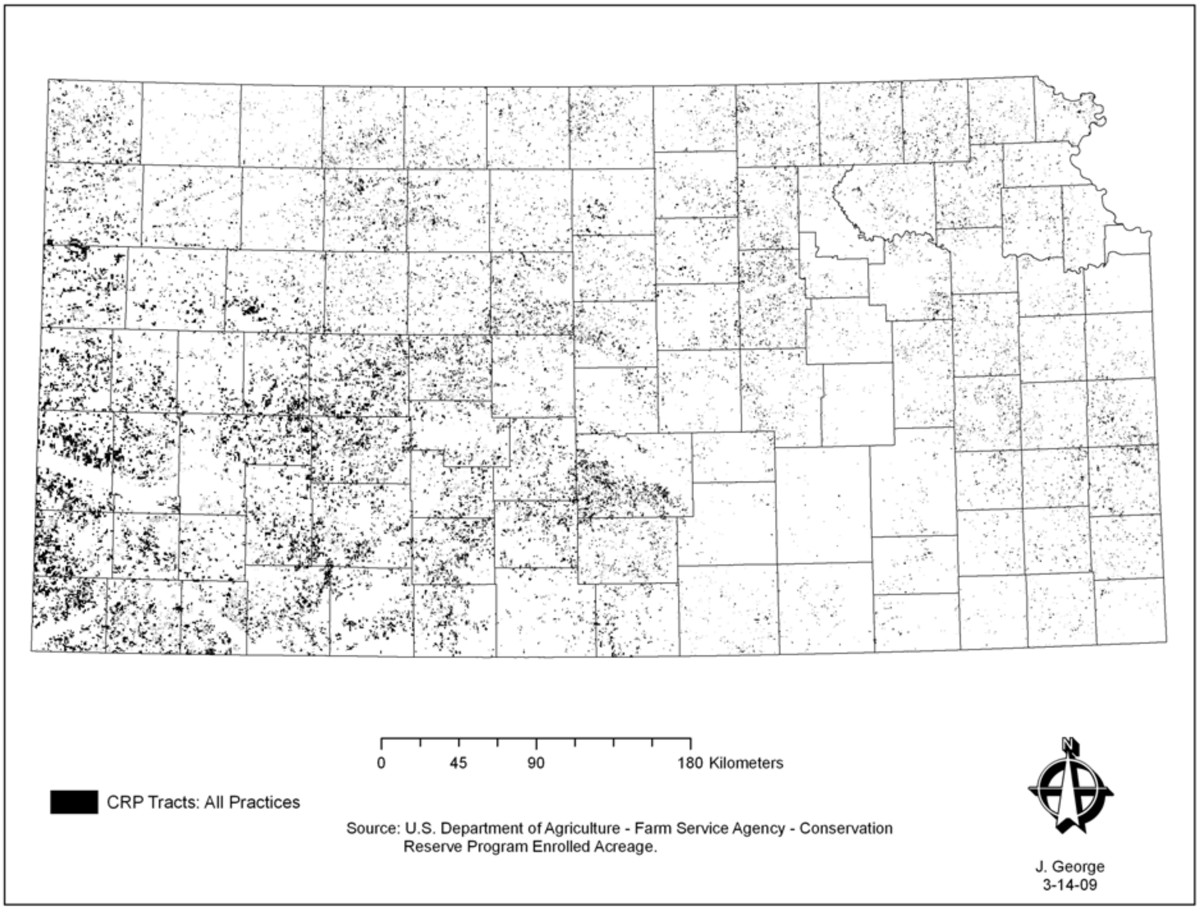


Figure 3.8 CRP Distribution in Kansas (March 2009)



Currently, within the CRP there are 38 Conservation Practices (CP), ranging from the planting of native grasses to the construction of erosion control structures along stream banks. This total excludes further breakdowns within each practice such as Tree Planting (CP3) and Hardwood Tree Planting (CP3A). The most common Conservation Practices in Kansas (Table 3.1) are Vegetative Cover–Grass–Already Established (CP10), Establishment of Permanent Native Grasses (CP2), Restoration and Management of Declining Habitat (CP25), Filter Strips (CP21), and Habitat Buffers for Upland Wildlife (CP33). Combined, these account for approximately 97.8 percent of all acres enrolled in the state.

The difference in land ownership patterns and Conservation Practices between the eastern one-third and western two-thirds of the state is evident when the contract data are broken down. While CP10 is the most common practice in both regions, it makes up only 25 percent of total contracts in the east and nearly 40 percent of contracts in the west. The average tract size of the CP10 contracts also differs regionally, with an average of 18.9 acres in the east and 56.5 acres in the west. Another major difference is the use of filter strips (CP21). In the eastern one-third of the state, CP21 is the second most common practice, accounting for nearly 25 percent of contracts and averaging only 2.4 acres per tract. In the central and western portions of the state, CP21 totals only 3 percent of all contracts.

Table 3.1 Top Five CRP Conservation Practices in Kansas (FSA 2003b)

Conservation Practice (CP)	Practice	Purpose	Percent of Total Acres Enrolled
10	Vegetative Cover – Grass – Already Established	▪ Reduce soil erosion & sedimentation ▪ Improve water quality ▪ Enhance wildlife habitat	52.3
2	Establishment of Permanent Native Grasses	▪ Restore a plant community similar to its historic climax or the desired plant community ▪ Provide or improve forages for livestock ▪ Provide or improve forage, browse or cover for wildlife ▪ Reduce erosion by wind and/or water ▪ Improve water quality & quantity	27.6
25	Restoration & Management of Declining Habitat	▪ Restore land or aquatic habitats degraded by human activity ▪ Provide habitat for rare & declining wildlife species by restoring & conserving native plant communities ▪ Increase native plant community diversity ▪ Manage unique or declining native habitats	15.9
21	Filter Strips	▪ Reduce sediment, particulate organics, and sediment adsorbed contaminate loadings in runoff & surface irrigation tailwater ▪ Reduce dissolved contaminate loadings in runoff ▪ Restore, create or enhance herbaceous habitat for wildlife & beneficial insects ▪ Maintain or enhance watershed functions & values	1.0
33	Habitat Buffers for Upland Wildlife	▪ Create corridors for wildlife movement ▪ Provide wildlife food ▪ Provide nesting, brood & winter cover ▪ Provide habitat for beneficial insects ▪ Reduce erosion & improve water quality	1.0
		Total:	**97.8**

CHAPTER 4 - Literature Review

In an attempt to gain a more holistic view of the recent research pertaining to the CRP, my literature review ranges outside the scope of those studies specific to the topic of CRP slippage. As a multiple objective program, it is important to include this research to gain a better understanding of how alternate studies view the benefits of the CRP.

Slippage

Early research regarding the phenomenon of slippage as it related to acreage reduction programs included that of Ericksen and Collins (1985). While this research pertained to programs predating the current CRP, the premise and methods utilized for calculating slippage rates are similar. The major difference is in the goals of the acreage reduction programs. The CRP was the first acreage reduction program to place much importance on the reduction of soil erosion. Prior to the CRP, the major focus of acreage reduction programs was to control crop production and increase agricultural commodity prices. Ericksen and Collins (1985) analyzed the effectiveness of acreage reduction programs at actually reducing total crop supply. By comparing the annual change in harvested acreage with the change in acreage idled through reduction programs in the United States, they were able to calculate annual slippage rates. Their results led them to conclude that these early acreage reduction programs were inefficient at reducing crop supplies because of increased plantings on unrestricted acres and a reduction in the impact from idling lower yielding lands.

Previous research regarding slippage in the CRP has varied in both the spatial extent of the study area and the approach or methods used for the analysis. Leathers and Harrington (2000) focused specifically on the issue of land slippage in the 14-county area of Southwestern Kansas from 1988 to 1994. Because acreage was also enrolled in both the Acreage Conservation Reserve (ACR) and the Conservation Use for Pay program (CUPAY) during the study period, the annual conservation acreage totals included those acreages and that of the CRP. Using agricultural statistics, slippage rates were calculated at the county level for each year in the study period and remotely sensed data was analyzed for a refined study area. Slippage rates varied from one county to the next, with some counties showing more year to year variability. Overall results indicated that slippage in Southwestern Kansas greatly reduced the effectiveness of the CRP at decreasing soil erosion.

A similar study conducted by Wu (2000), analyzed the slippage effect on a much larger 12 state region in the central U.S. The study outlined the ways in which both substitution and output price increase can bring fallow or unbroken land into production. Data for the slippage analysis were acquired from the 1982 and 1992 National Resource Inventories produced by the Natural Resource Conservation Service (NRCS) and county-level CRP summary data from the Economic Research Service (ERS). A multivariate regression model was used to examine the impact of the CRP on the acreage of non-cropland converted to cropland. The dependant variable was acreage of non-cropland converted to cropland between 1982 and 1992 as a proportion of the total land area in each agricultural statistical unit. Independent variables included acres of cropland enrolled in CRP by 1992 and other characteristics, such as farm size and population. The variables included in the regression explained 45 percent of the variation in the converted cropland acreage according to the analysis. The study concluded that substantial slippage effects were present in the CRP and, more specifically, that for each 100 acres of land retired under the CRP in the central U.S., 20 acres of non-cropland were converted to cropland.

Soil Quality and Erosion

The National Research Council's (1993) analysis of agricultural impacts on soil and water quality stated that "protecting soil quality, like protecting air and water quality should be a fundamental goal of national policy" (p. 18). Soil quality not only affects the productivity of the land, but is also connected to the physical condition of other resources including air, water, plants, and animals (Mausbach 1996). According to a study conducted by Pimental et al. (1995), approximately 90 percent of cropland in the U.S. is losing soil at what is considered to be above a sustainable rate.

Realizing that CRP contracts are not all continuously enrolled, a study by Gilley and Doran (1997) in Northern Mississippi attempted to determine the post-enrollment soil erosion potential of CRP land once it was returned to cropland. Soil erosion rates were known for the test field prior to enrollment and were compared to erosion rates after the one-time CRP field had been tilled and left fallow for nine months. The results indicated that soil erosion rates prior to enrollment in the CRP were very similar to erosion rates after the conservation cover had been tilled.

Baer et al. (2000) constructed a study to determine the impacts of the CRP on soil quality in terms of carbon and nitrogen content. They examined the soil quality from samples obtained at a depth of 2 to 4 inches from fields recently converted from agricultural production to native perennial grasses through the CRP, fields that had been in the CRP for a period of ten years, and fields of native prairie. While both of the CRP samples were lower in terms of total carbon and nitrogen pools in comparison to the native prairie, the long-term (ten year) samples did show significant increases. Based on the results and comparisons of the analyzed soil samples, the authors concluded that the CRP does promote soil restoration; however ten years is not a sufficient timeframe for restoring soils to pre-cultivation quality levels.

Water Quality

Khanna et al. (2003) indicated that the growing concern over the negative impacts of agricultural activities on water quality has changed the focus of land retirement programs from reducing on-site soil erosion to reducing damages to water bodies caused by sediment and chemical runoff. This shift in priorities is indicated by the introduction of the Conservation Reserve Enhancement Program (CREP) as a modification to the CRP. This study attempted to identify areas in Illinois where implementation of the CREP would be most effective at meeting the state's environmental goals regarding the reduction of sediment and nutrient loadings. The study used an integrated framework to combine both spatial and biophysical attributes of land within the sample watershed with a hydrological and an economic model. Not surprisingly, the results indicated that croplands that are highly sloping and adjacent to water bodies should be selected for retirement. The more interesting portion of the results resulted from the inclusion of the economic model, which indicated that a marginal value rental payment scheme would achieve the program goals at a lower cost than a productivity-based rental scheme.

Lovell and Sullivan (2006) analyzed the effects of conservation buffers and then looked at the relationship between buffers and the CRP. It is noted that conservation buffers are extremely positive for the ecological health of rural landscapes, decreasing soil erosion and increasing water quality. Water quality benefits associated with buffers include reduced sediment loading from runoff and decreased leaching of agricultural chemicals and fertilizers. Because of the perceived value of buffers, the authors note, the U.S. Department of Agriculture is committed to increasing buffer adoption through the CRP, which is the primary program for funding buffers in the U.S. However, U.S. policy makers have not fully embraced the idea of conservation buffers. Recommendations that resulted from this study included modifying policies to better reflect the preferences of landowners and society, a multi-disciplinary study of buffer systems at the watershed scale, and designing buffers that consider aesthetic preferences and for varying locations.

Wildlife Benefits

Due to the fact that approximately 70 percent of land in the lower 48 states of the U.S. is in private ownership, land retirement programs are very important to the conservation of fish and wildlife (Burger 2006, Gray and Teels 2006). Although soil conservation was the original focus of CRP contracts, the perennial vegetation planted also provided habitat for wildlife (Gray and Teels 2006). The increased environmental emphasis of CRP enrollment requirements, as indicated by the switch to the EBI, reflects the importance of reserve programs on wildlife habitat, and so do the many studies that document the benefits of habitat improvement. These studies range from specific impacts of reserve lands on a single species, to overall effects of conservation lands on biodiversity.

Fields et al. (2006) studied the impact of CRP lands on the nesting and brood survival of the lesser prairie-chicken in west-central Kansas. The study determined that the probability of nest survival was best determined by the age of the nest and brood, timing during the season, age of the brooding female, and precipitation during the brooding period. Although location of nests and broods were considered, the fact that some nesting/brooding sites were located on CRP lands was not determined to be a significant factor in determining survival rates. In other words, there appeared to be no benefit to those nesting/brooding sites that were located on CRP lands during this study period.

A study by Kamler et al. (2004) compared the home ranges and seasonal habitat of coyotes in northwestern Texas on native prairie, farmland, and CRP land, in an attempt to determine impacts of CRP on populations and ranges. The study indicated that CRP fields do provide important cover for coyotes, however the authors emphasize that CRP lands were the only tall permanent vegetation in their study area. Coyotes were divided into two distinct groups, residents and transients, and the impacts of the different cover types were measured for either group. The research showed the importance of CRP habitat as areas for resident coyote dens and foraging habitat for transients. The methodological approach for this study did not allow for the measurement of possible carrying capacity increases on CRP lands; however, the authors noted the likelihood of an increased capacity based on the high use of CRP areas by both groups of coyotes.

A study conducted by Cunningham (2005), attempted to compare the relative benefit for grassland songbirds of public grasslands maintained as habitat in the Midwestern U.S. with private land that was retired in the CRP. Her study area was in southern Minnesota, where bird survey data from CRP fields and public lands were gathered. She then ran an assessment of fragmentation utilizing GIS. Results indicated that native songbird abundance and diversity were greater on CRP lands. The cause of this appears to be the vegetation composition, with more dense grasslands on CRP lands than on public lands. The author attributes this to funding differences, and notes that temporal variation of CRP lands could have a strong influence on the success or failure of biodiversity conservation in this region.

Klute, Robel, and Kemp (1997) addressed the issue of non-reenrollment of CRP lands and the associated impact on grassland birds in Kansas. The timing of this study was based on the fact that unless renewed, many CRP contracts were set to expire in 1997. The study indicated that up to 70 percent of land in Kansas that was not re-enrolled would be converted to pasture. The study therefore compared the avian use of CRP areas with that of pastures in order to determine if the conversion of CRP to pasture would negatively impact grassland birds. The authors found that CRP lands in the study area had less dense vegetation than pastureland during portions of the year, although vegetation on CRP lands was taller late in the summer. Total avian abundance was greater in pastures than in CRP fields. As such, it was concluded that the conversion from CRP to pasture in Kansas would not be detrimental to grassland bird populations if the land were moderately grazed.

CHAPTER 5 - Methods

Because crop reports are made annually at the county level, my analysis was conducted based on these spatial units, rather than ecological units such as watersheds. The slippage calculations are based partly on the county crop figures as made available through the USDA National Agricultural Statistics Service (NASS). Through this source, annual acreage totals for both planted and harvested crops were compiled for all 105 counties in Kansas. A state level branch of the NASS, the Kansas Agricultural Statistics Service (KASS), provided the source for historical reports regarding average annual prices paid for the four main grain crops (wheat, sorghum, corn, and soybeans) and average annual land values for irrigated, dry-land, and pastureland. Finally, regional annual production costs were obtained from the USDA Economic Research Service (ERS) for each of the four main grain crops. These production costs include average annual prices (in dollars) paid for seed, fertilizer, custom operations, and energy inputs per planted acre for each crop.

The study period of 1995-2005 was chosen for several reasons. First, during this timeframe the CRP accounted for the overwhelming majority of land in retirement programs within the state of Kansas. Second, restrictions in data availability for one or more of the independent variables limited the length to this eleven year period. Finally, the period of 1995-2005 contains significant variations in regard to output prices paid and input costs for agricultural commodities.

Slippage Calculations

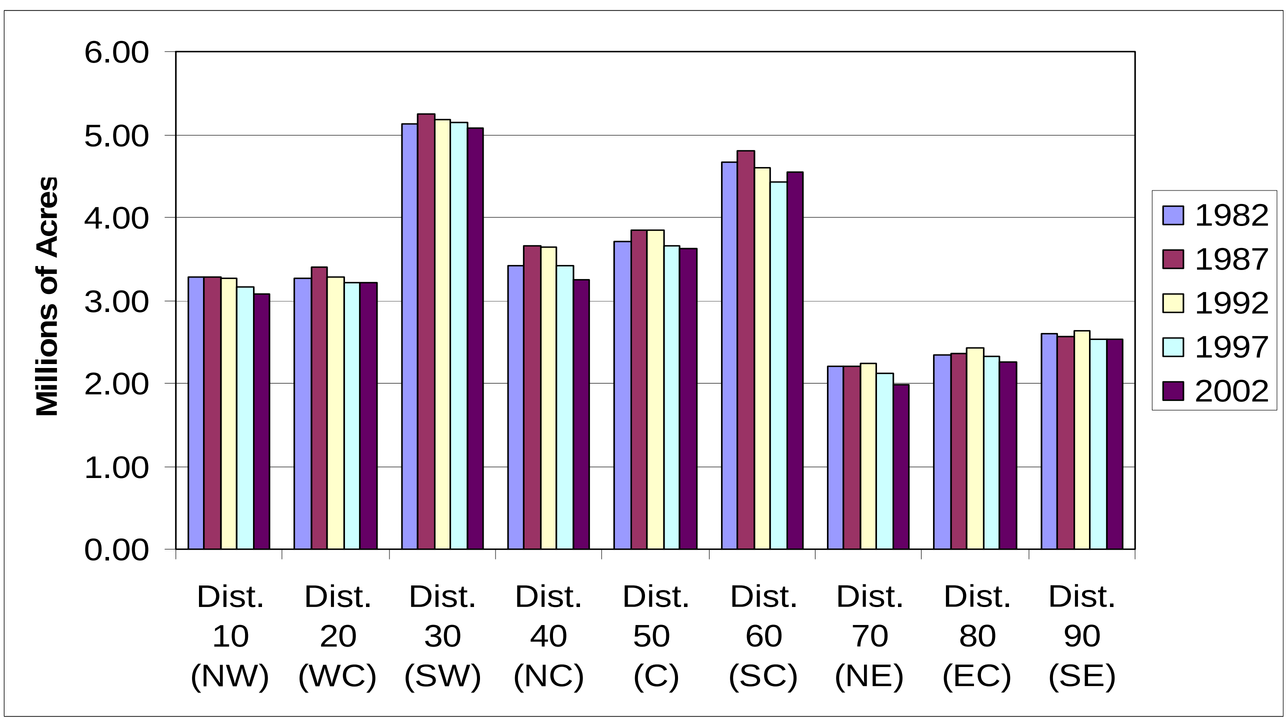
The method used for slippage calculations is the same as that which was employed by Leathers and Harrington (2000) when analyzing the effectiveness of the CRP in reducing soil erosion in a 14 county area of southwestern Kansas. Calculations are based on county level agricultural statistics and land retirement program enrollment numbers using the following equation:

$$\mathbf{S = \{1.0 - [(A - A^*) / L]\} \times 100,}$$

where **S** is the slippage factor, **A** is the acreage that would be in production without CRP, **A*** is the actual acreage of crops, and **L** is the acreage enrolled in the CRP.

In determining the acreage that would be in production without the CRP (**A**), several factors must be considered. Leathers and Harrington (2000) used the average number of acres harvested in 1980, 1981, and 1982, rather than the three year period immediately prior to the CRP, because there was no land retired through alternate acreage diversion programs in 1980 and 1981 and very few acres retired in 1982. For this same reason, I have chosen to use this time period in determining the county level base acreage for slippage calculations in my study. Using this time period does introduce a potential source of error. If the total acreage in production was increasing post-1982, then the base acreage (**A**) would be too low causing inflation in the calculated slippage rates. An analysis of district level total cropland figures, gathered from the USDA NASS Census of Agriculture (1982, 1987, 1992, 1997, 2002), shows the total acreage for 1982 as equal to or higher than the total acreage for 1997 and 2002 for all districts (Figure 5.1; see also Figure 3.6). This lower total cropland acreage cannot be attributed to the introduction of the CRP as the Census of Agriculture includes reserve program lands as idled cropland in determining this figure. Therefore, using the average acreage in production from 1980-1982 as the base acreage for each county should not produce any significant inflation in the slippage calculations.

Figure 5.1 Agricultural Census: Total Cropland in Production by District



An additional possible source of error worth noting is the agricultural practice of double-cropping. Double-cropping occurs when two different crops are grown on the same acreage during a growing season. Unfortunately, acreage figures for this practice are not available at any scale for the state of Kansas. Because of the lack of available data, a method must be developed in an attempt to overcome the possibility of overestimating acreage in production due to this practice. Leathers and Harrington (2000) used the total acreage harvested rather than the total acreage planted in an attempt to remove the impact of double-cropping on reported acreage in production. I have found that the impact of poor harvest years introduces a significant amount of undue variation on slippage calculations. To decrease the impact of poor crop years I calculated a 25 year (1980-2004) average of the proportion of planted crops that were harvested for each county. The total reported planted acreage for each county was then multiplied by the 25 year average percentage harvested for each year in the study (1980-1982 and 1995-2005); the results were used for both the acreage in production without CRP (**A**) and the actual acreage of crops (**A***), effectively removing the influence of extremely poor harvest years while still accounting for the practice of double-cropping. While this method may help to curb the inflation of slippage calculations created by overestimation of actual acreage in production, some inflation may still exist.

As traditional crop rotation methods have given way to continuous cropping practices fueled by the increased use of fertilizers, overestimation of actual acreage in production is a difficult obstacle to overcome without the availability of more detailed data regarding the practices taking place on the reported acreage. Another area where the lack of detailed data may impact the accuracy of total acreage in production estimations is the scale at which individual crops are reported on annually. Due to privacy concerns, NASS often combines counties when reporting totals for alternative crops within Kansas such as oats, rye, and barley. Because of this, it is impossible to gather county level data for all crops that are planted within each county on an annual basis. However, these alternative crops together only account for an average of approximately 5.5 percent of statewide total planted crops within the study period (1995-2005). The lack of these crops in all figures for total actual planted acres (**A***) annually should not significantly impact the accuracy of slippage calculations and may help to mitigate any overestimation of actual planted acreage.

Figures for Ford County can be used as an example of how the slippage rates are calculated: in 1980-1982, after adjusting for the 25 year (1980-2004) average proportion of planted crop acreage that was harvested (89.91 percent), an average of 317,534 acres were in production. In 1995, after making the adjustment (average harvesting of 89.91 percent of planted acreage), 314,327 acres were under cultivation and 49,318 acres were enrolled in the CRP. Slippage for 1995 equaled: 1 - [(317,534 - 314,327)/49,318], or 0.935. In other words, for every 100 acres enrolled in the CRP, only 6.5 acres were taken out of production; the remaining 93.5 percent were slipped acres.

Agricultural Commodity Pricing & Costs

Due to the lack of available county level data regarding annual prices paid for agricultural commodities, these data had to be gathered at the district level. NASS and KASS divide the state of Kansas into nine statistical district that each include anywhere from eight to fourteen counties. The divisions are labeled as Northwest, West-Central, Southwest, North-Central, Central, South-Central, Northeast, East-Central, and Southeast. The data sets that were collected from the district level KASS historical reports include the average annual price paid per bushel for wheat, sorghum, corn, and soybeans, and the average annual land values for irrigated cropland, non-irrigated cropland, and pastureland. Variations in annual average prices paid for the four main grain crops were very slight among districts through the study period (Figures 5.2, 5.3, 5.4, 5.5), with highs and lows generally occurring in the same years for all crops. Because of the district-level similarities among reported prices paid, any spatial relationships that may exist between CRP acreage slippage and agricultural commodity output prices are not easily observed. Given the high degree of spatial variability for the average CRP slippage rates, further analysis regarding annual variation in output prices and slippage rates within each district (rather than across districts) may be beneficial.

Figure 5.2 Wheat: Average Annual Prices Paid by District (1995-2005)

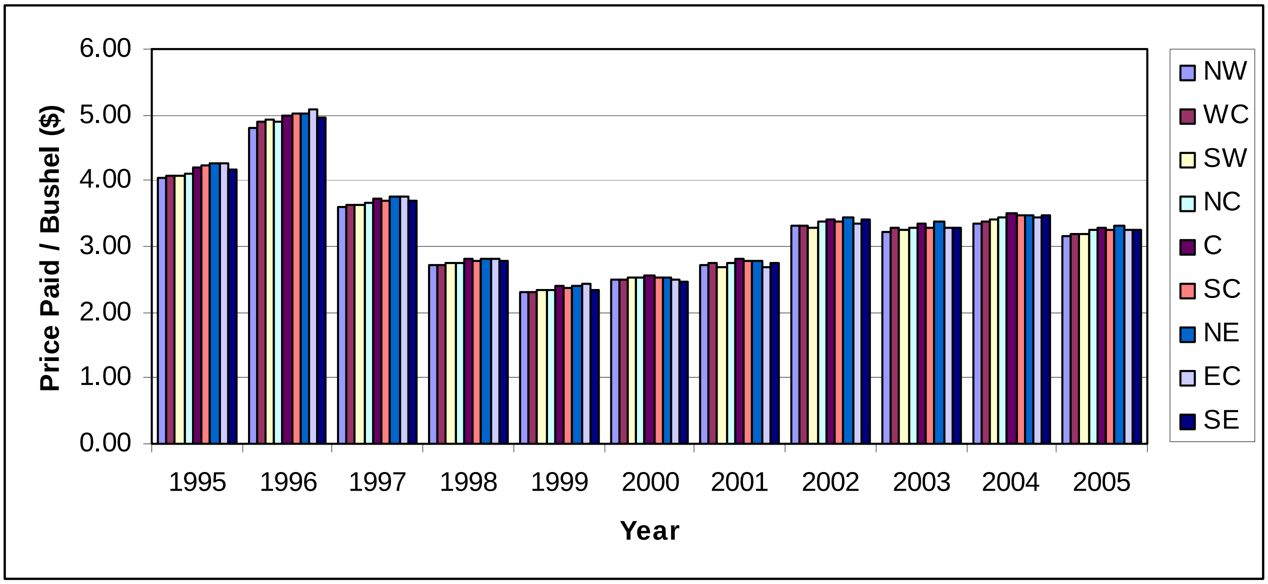


Figure 5.3 Sorghum: Average Annual Prices Paid by District (1995-2005)

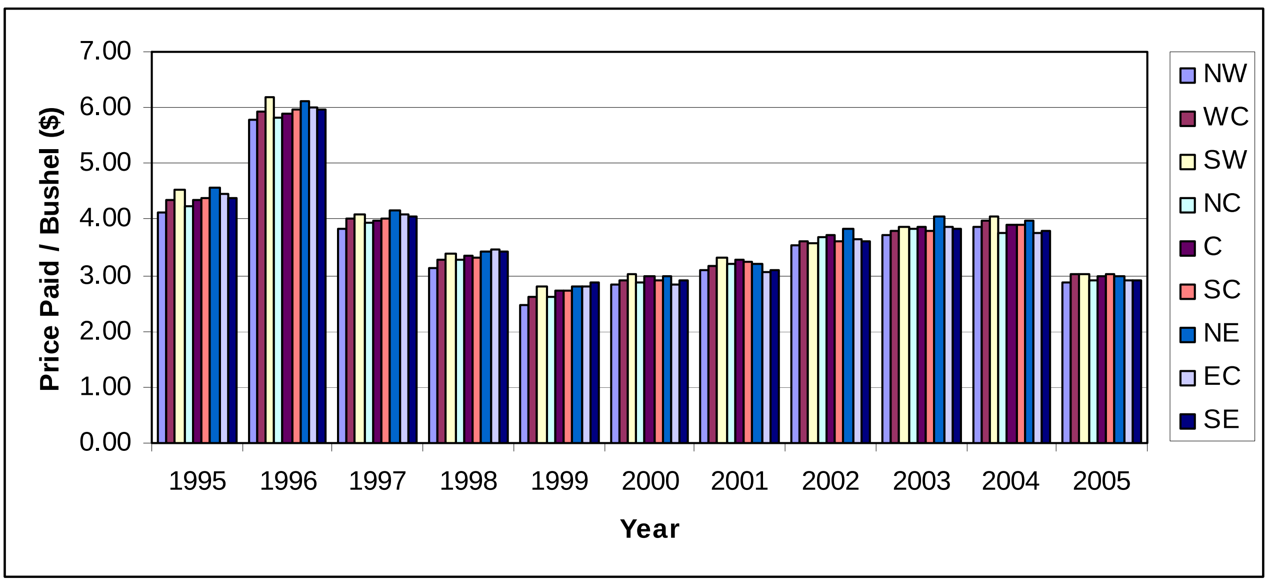


Figure 5.4 Corn: Average Annual Prices Paid by District (1995-2005)

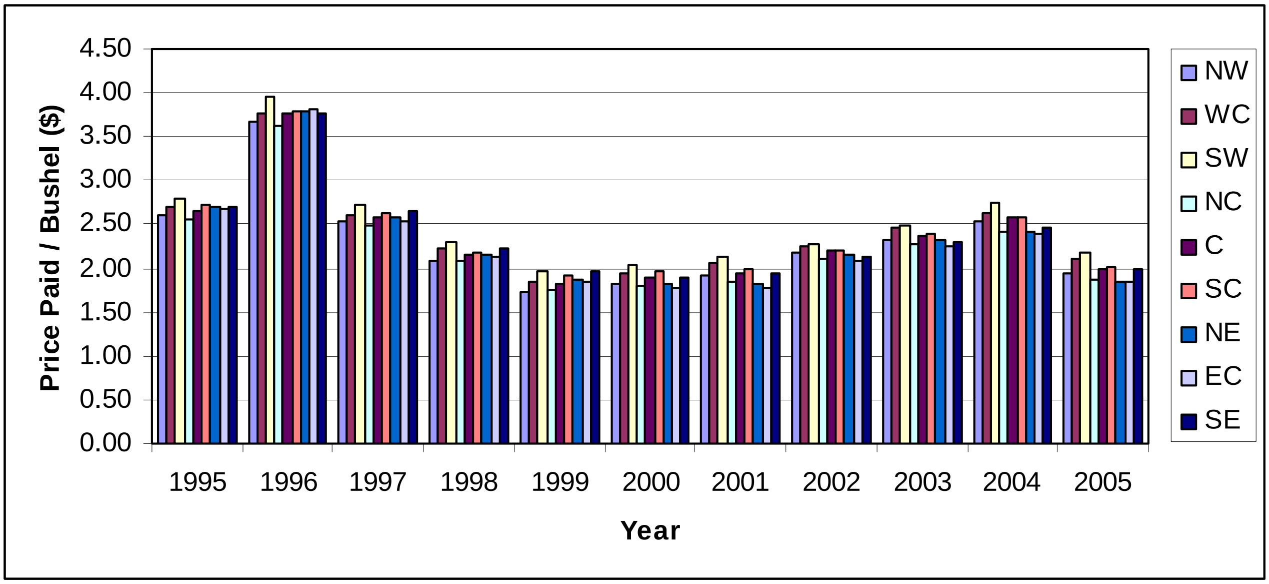
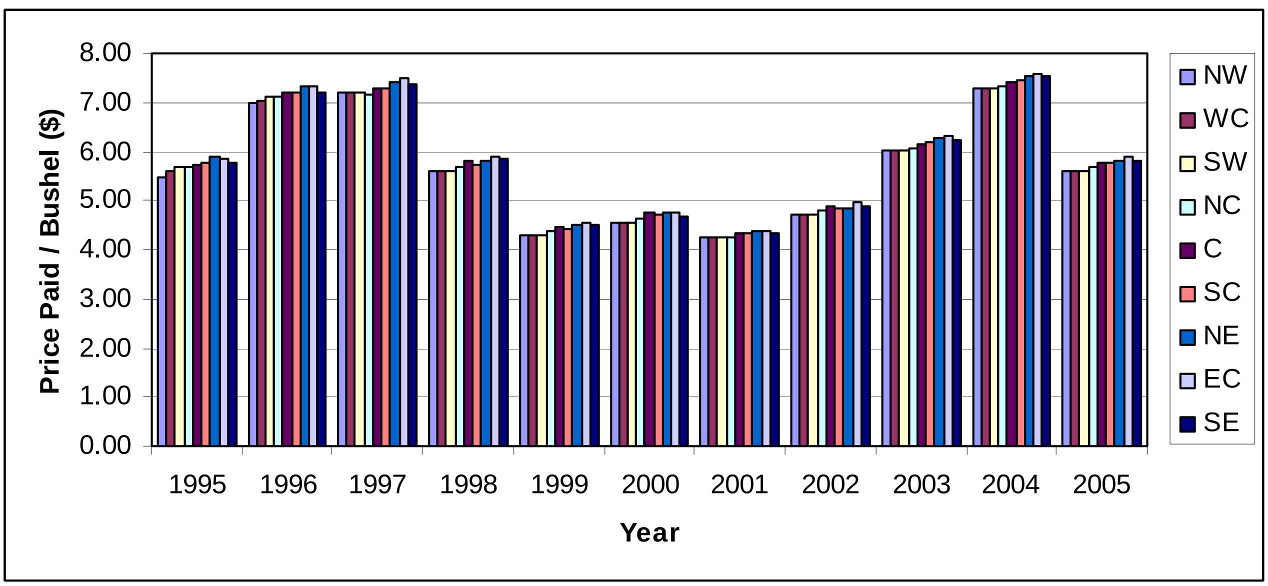


Figure 5.5 Soybeans: Average Annual Prices Paid by District (1995-2005)



Because no data are available at the county, district, or state level, I was forced to include agricultural input costs based on data from a larger area. The USDA ERS produces historical reports on commodity costs and returns at the regional level. While this is not ideal, the data should be sufficient given the lack of intrastate variation in average input costs. However, comparing regional scale data to county level CRP slippage rates may be troublesome for statistical analysis, introducing a high degree of correlation between predictor variables. The region used is termed the Prairie Gateway by the ERS, and includes all of Kansas, southern Nebraska, eastern Colorado and New Mexico, western Oklahoma, and all of Central Texas. The data collected from these reports includes the average cost per planted acre for wheat, sorghum, corn, and soybeans, including costs for seed, fertilizer, custom operations (planting and harvesting), and energy inputs (fuel, lube, and electricity). This annually compiled data set uses a sampling method from which estimates of the regional averages are derived.

Statistical Analysis

Using the annual slippage calculations as my response variable, a multivariate linear step-wise regression analysis was used to examine the relationships between CRP slippage and agricultural commodity output prices and input costs (Table 5.1). The software utilized in

Table 5.1 Regression Analysis Variables and Predicted Relationships

Response Variable	Predictor Variables
CRP Slippage	▪ Price Paid per Bushel Wheat (+) ▪ Price Paid per Bushel Sorghum (+) ▪ Price Paid per Bushel Corn (+) ▪ Price Paid per Bushel Soybeans (+) ▪ Irrigated Cropland Value (-) ▪ Non-Irrigated Cropland Value (-) ▪ Pastureland Value (-) ▪ Cost per Planted Acre Wheat Seed (-) ▪ Cost per Planted Acre Wheat Fertilizer (-) ▪ Cost per Planted Acre Wheat Custom Ops. (-) ▪ Cost per Planted Acre Wheat Energy Inputs (-) ▪ Cost per Planted Acre Sorghum Seed (-) ▪ Cost per Planted Acre Sorghum Fertilizer (-) ▪ Cost per Planted Acre Sorghum Custom Ops. (-) ▪ Cost per Planted Acre Sorghum Energy Inputs (-) ▪ Cost per Planted Acre Corn Seed (-) ▪ Cost per Planted Acre Corn Fertilizer (-) ▪ Cost per Planted Acre Corn Custom Ops. (-) ▪ Cost per Planted Acre Corn Energy Inputs (-) ▪ Cost per Planted Acre Soybean Seed (-) ▪ Cost per Planted Acre Soybean Fertilizer (-) ▪ Cost per Planted Acre Soybean Custom Ops. (-) ▪ Cost per Planted Acre Soybean Energy Inputs (-)

completing this task was Minitab 15. As is the case with most statistical tests, a quality regression analysis relies upon certain assumptions regarding the variables being used. As noted by Schroeder et al. (1986), the main assumptions of multiple regression that should always be tested include linearity, homoscedasticity, and normality. Therefore, my initial analysis includes the evaluation of the datasets in regard to these assumptions (see Chapter 6).

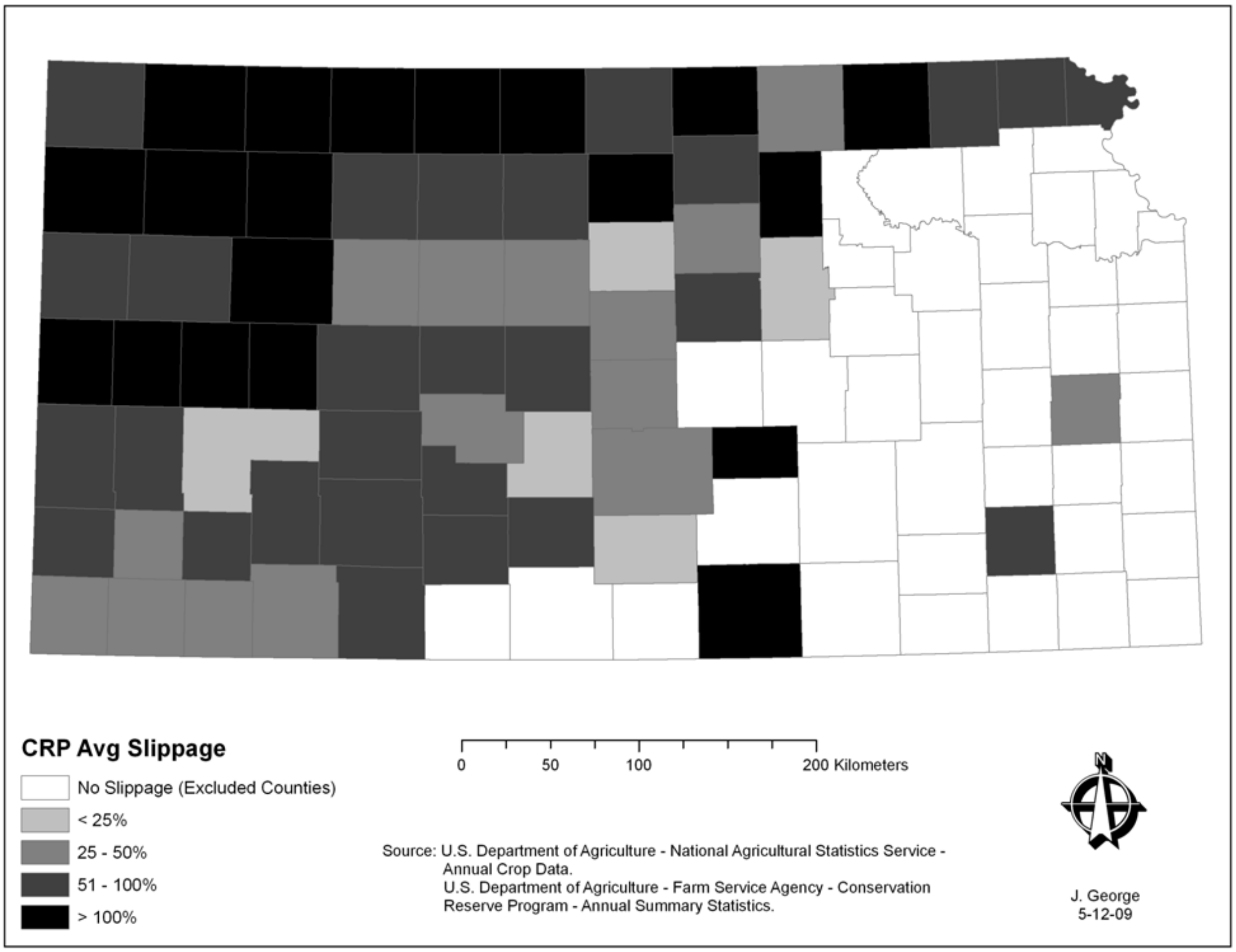
The predicted positive and negative relationships depicted in Table 5.1 are based on the assumption that as prices paid for agricultural commodities increase, a monetary incentive exists to plant additional acreage. Likewise, as input costs rise, a monetary disincentive should reduce the planting of additional acreage. These assumptions are based on a static setting and do not account for the dynamics of the variable agricultural markets where increases in input costs may be offset by increases in the prices paid for commodities; lags between price shifts and CRP/slippage decisions are possible, but this research does not attempt to make time adjustments. A model attempting to account for these variables would be very complex and is well outside the scope of this project.

CHAPTER 6 - Results

Slippage Results

The county level annual slippage calculations and following refinement of the study area provides an interesting spatial pattern of slippage rates across Kansas (Figure 6.1). While the vast majority of counties within the eastern one-third of the state have no slippage (often negative) in regards to the CRP, nearly every county in the western two-thirds has a positive average slippage rate for the study period. As discussed in chapter 3, I would speculate that this spatial disparity in slippage rates is primarily due to the difference in land ownership patterns

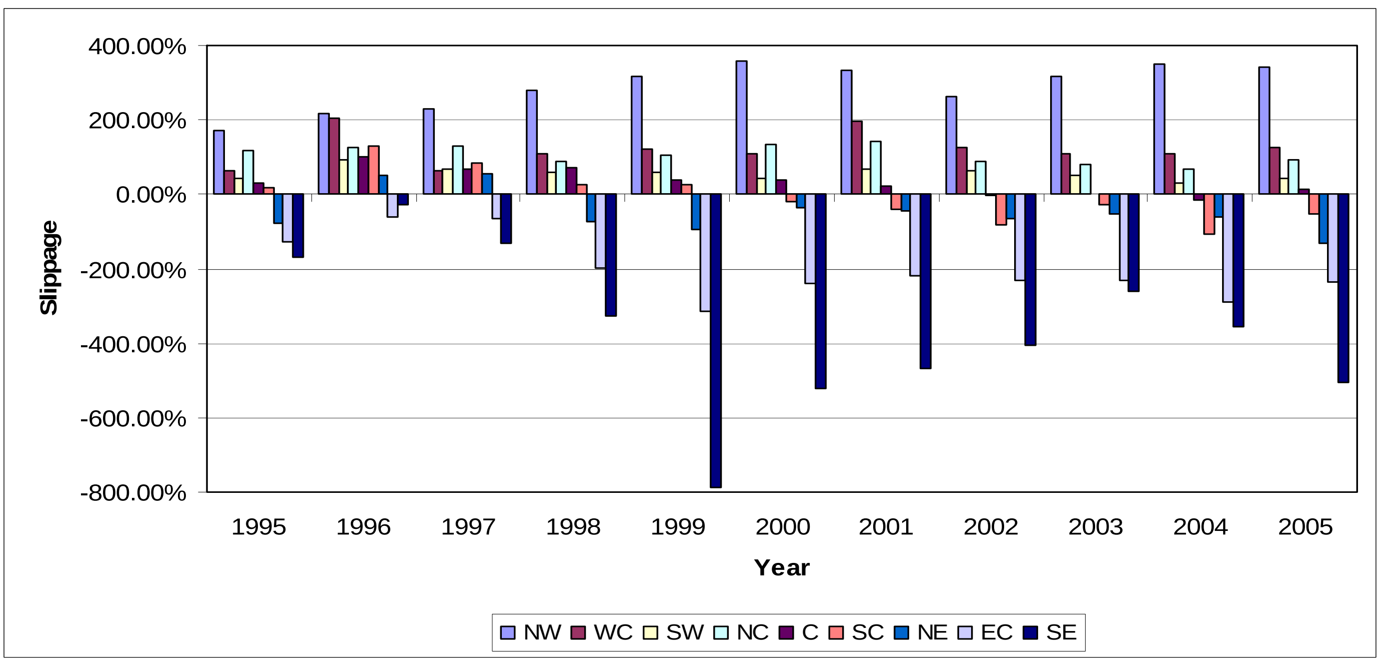
Figure 6.1 Average Annual Slippage for the Study Period (1995-2005)



and lack of unutilized farm ground in the more populated eastern portion of the state. The exclusion of the eastern counties with no slippage may have a significant impact on independent variables such as soybean production costs, as soybeans are primarily planted within the eastern one-third of the state.

Complete results from the slippage calculations are provided in Appendix A. District level annual averages are presented in graphic format to allow for regional comparison in average slippage rates prior to study area refinement (Figures 6.2). As would be expected based on the average county level slippage rates for the study period (Figure 6.1), the highest average slippage rates occur in the northwestern district, topping out at just over 350 percent in 2000. Likewise, the lowest average slippage rates were located in the southeastern district with a low of approximately -788 percent in 1999. For the northeastern and east-central districts, the extreme slippage values for Wyandotte and Johnson County (highly urban areas) were removed from the calculations for average annual slippage. The negative slippage values for some years in the

Figure 6.2 Annual Slippage Rates by District (1995-2005)



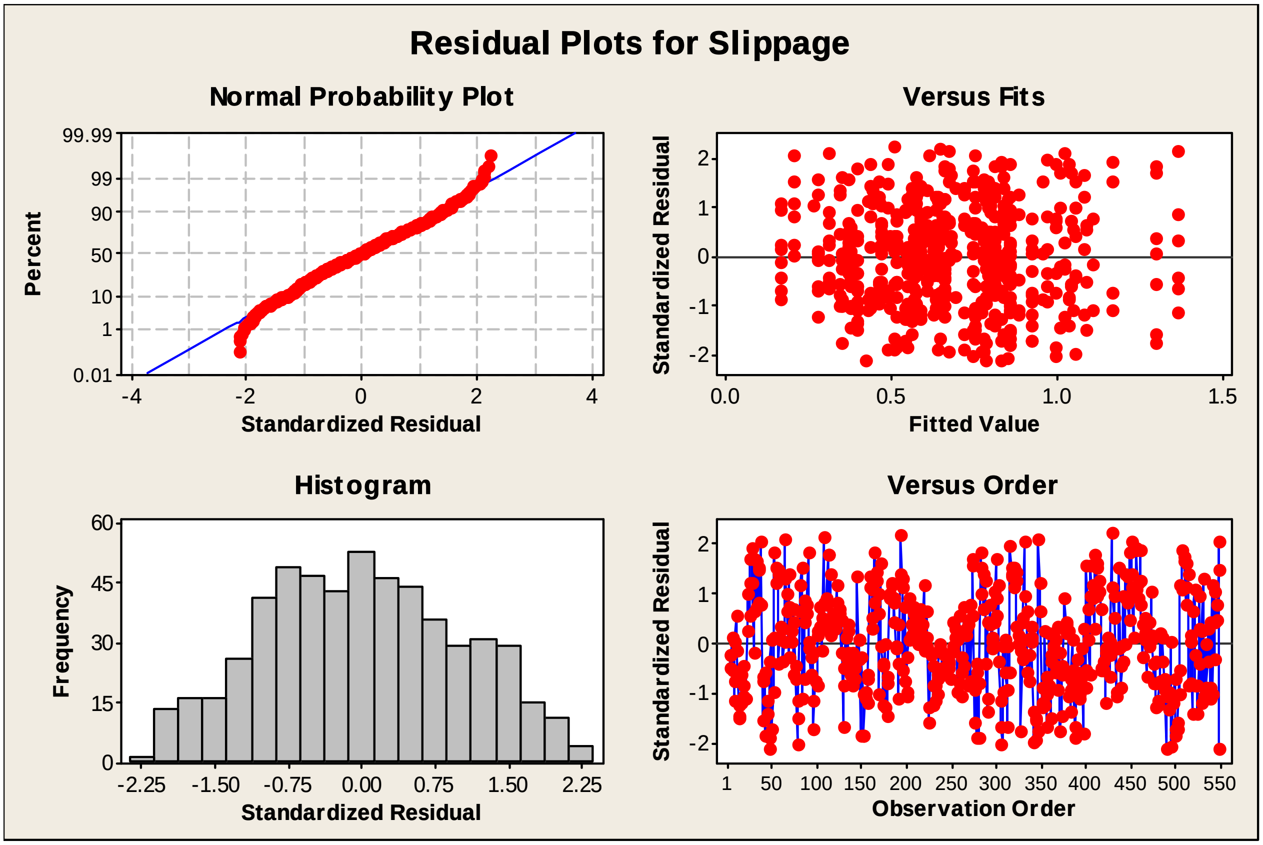
central and south-central districts, and nearly all years in the three easternmost districts, indicate a loss in cropland in production beyond the acreage enrolled in the CRP. Although alternative land retirement programs are available within the state, the low total acreage enrolled in these programs could not possibly account for these figures. Given the concentration of urban populations within the majority of the districts with negative average annual slippage rates, a future analysis regarding the impacts of urban sprawl as it relates to CRP slippage may be beneficial.

Regression Analysis Results

Scatterplots, including regression lines, were produced for each predictor variable independently against slippage rates (Appendix B). The evident lack of significant correlation between the predictor variables and response variable was not promising. However, there was no evidence of any curvilinear relationships and the fitted regression lines indicated slight positive and negative relationships with some independent variables.

Initial analysis of normal probability plots, graphing the standardized residuals against their expected values, indicated non-normality to some degree for all variables. In an attempt to normalize the data, reducing the probability of Type I and Type II errors, outliers were removed from the dataset. With the outliers removed, the regression analysis was run (alpha = 0.05) and a second analysis of assumptions conducted. While the probability plot showed improvement with regards to normality, both negative and positive skewness was still present (Figure 6.11). According to Schroeder et al. (1986), moderate departures from normality do not seriously affect results for data with a large number of observations. Based on 11 years and 65 counties, 715 observations were initially used for analysis. 167 outliers were removed for further statistical analyses. The majority of outliers that were removed came from the northwestern and eastern districts where the most extreme highs and lows in county slippage calculations were located. Given my sample size of 548 observations after the removal of outliers, I proceeded knowing that some non-normality might still exist.

Figure 6.3 Residual Plots for Regression Analysis



Constant variance, often termed homoscedasticity, is apparent when analyzing the standardized residual versus fitted values plot as the residuals are randomly scattered around zero. Prior to the removal of outliers, including many observations with large standardized residuals, no patterns were apparent. Aside from constant variance, this random scattering can also indicate the presence of linear relationships within the model.

Several of the agricultural input costs were automatically removed from the model by the Minitab 15 software after they were identified as being highly correlated with other predictor variables. This is most likely the result of comparing regional level input cost data and the similarities of increases and decreases from year to year amongst the different crops. The variables removed at this stage include the cost of corn custom operations, cost of corn energy inputs, cost of soybean seed, cost of soybean fertilizer, cost of soybean custom operations, and cost of soybean energy inputs. Additional variables with p-values exceeding the alpha, or acceptable probability, value (0.05) were removed from the model, including the cost of wheat fertilizer, cost of sorghum seed, cost of sorghum fertilizer, cost of sorghum custom operations, and cost of corn fertilizer. A stepwise regression analysis was run to determine the impact of removing variables on the fit of the model. While the R-squared value is indicative of how well the model fits the data, including too many terms in the model can make this value artificially high. Therefore, in determining the best fit model, the values for adjusted R-square (representing the fit of the model after adjusting for the number of terms) and S value (representing the standard distance that data values fall from the regression line) were used. Results from the stepwise regression indicated a precipitous drop in adjusted R-square with the removal of any variables and a slight increase in the S value. Because of this, it was determined that a model including all of the remaining predictor variables is the best fit. The results from the regression model with the remaining predictor variables are shown in Table 6.1.

Table 6.1 Initial Best Fit Regression Model Results

Predictor	Coef	SE Coef	T	P	VIF
Constant	10.062	1.515	6.64	0.000	
$ Paid Wheat	-0.9867	0.1498	-6.59	0.000	43.124
$ Paid Sorghum	1.6359	0.2055	7.96	0.000	118.968
$ Paid Corn	-2.5124	0.3346	-7.51	0.000	116.960
$ Paid Soybeans	-0.35538	0.06164	-5.77	0.000	17.363
Land Value Irr Cropland	-0.0003538	0.0001596	-2.22	0.027	5.707
Land Value NI Cropland	0.0018718	0.0003895	4.81	0.000	13.716
Land Value Pastureland	-0.0030141	0.0004911	-6.14	0.000	12.406
Cost Wheat Seed	0.8953	0.1067	8.39	0.000	40.109
Cost Wheat Custom Ops	-0.65591	0.09533	-6.88	0.000	43.132
Cost Wheat Energy Inputs	0.13543	0.03000	4.51	0.000	43.239
Cost Sorghum Energy Inputs	-0.09175	0.01967	-4.67	0.000	61.877
Cost Corn Seed	-0.09192	0.01554	-5.91	0.000	17.628

S = 0.373064   R-Sq = 20.0%   R-Sq(adj) = 18.2%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	12	18.6159	1.5513	11.15	0.000
Residual Error	535	74.4594	0.1392		
Lack of Fit	72	21.1798	0.2942	2.56	0.000
Pure Error	463	53.2796	0.1151		
Total	547	93.0753			

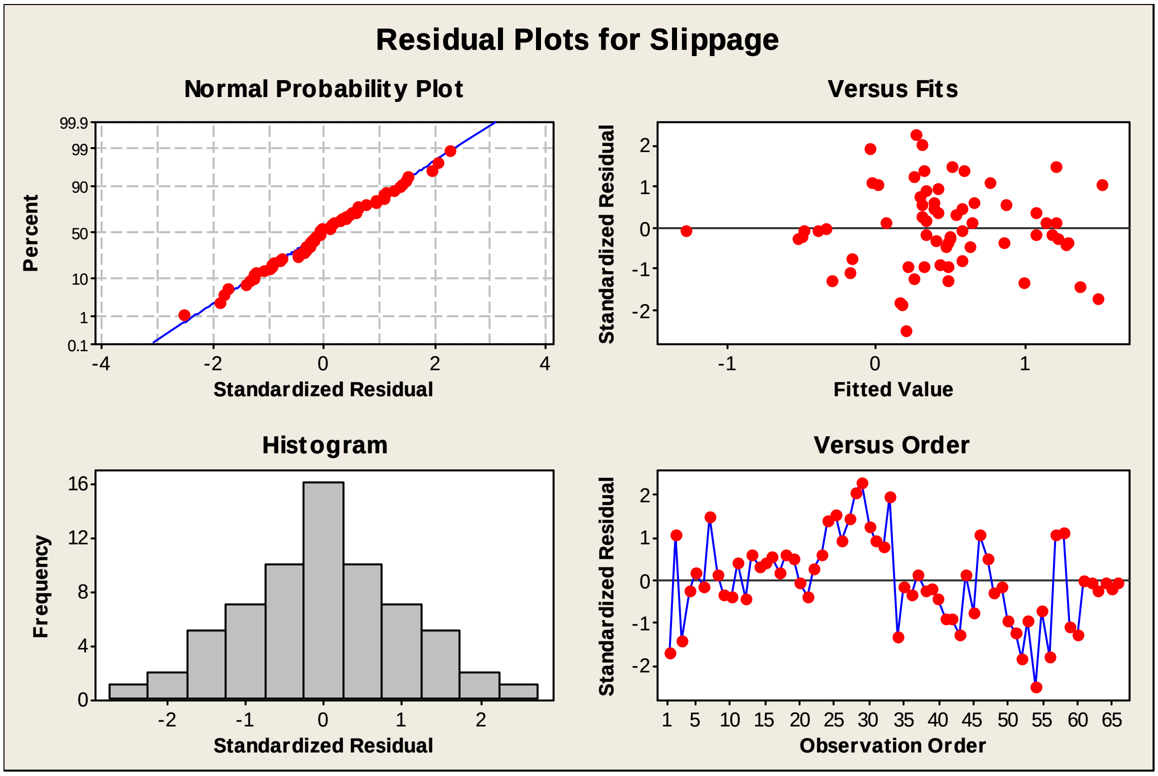
Although the individual predictor p-values are all less than the alpha value (0.05) and all T-values are greater than the alpha value, the adjusted R-squared indicates that these predictors account for only 18.2 percent of the variation in CRP slippage rates. While the analysis of variance p-value for regression (< 0.001) shows that the regression coefficients are significantly different from zero, the lack of fit p-value (< 0.001) indicates that the predictors used are not sufficient to explain the variation in CRP slippage rates. Because replicates of the response at certain settings of the predictors are observed, the sums of squares (SS) for residual error is equal to the SS of pure error plus the SS of lack of fit, implying that the variation caused by pure error and inadequate model specification make up the unexplained variation within the model. Mean squares (MS) represents the sums of squares (SS) divided by the degrees of freedom (DF), and the F-value is used to determine whether all coefficients within the model are zero (a hypothesis test more directly analyzed with the p-value).

Given the significant p-value regarding lack of fit and the low explanatory power of the model, it is clear that additional independent variables are required to adequately explain the variations in CRP slippage rates. Interestingly, many of the predicted relationships between CRP slippage rates and predictor variables were not reflected by the regression model. Based on the sign of each variable's coefficient within the model, the price paid for wheat, corn, and soybeans all have a negative relationship with CRP slippage (predicted positive relationship) and land values for non-irrigated cropland, the cost of wheat seed, and the cost of wheat energy inputs all show a positive relationship (predicted negative). Realizing that unexpected signs for model coefficients can be a sign of high multicollinearity within the model, the variance inflation factor (VIF) was added to the regression analysis. The VIF measures the increase in variability of each regression coefficient due to a linear association with other predictor variables. A VIF value of one means that the variable is not linearly related to the other variables and a VIF value greater than ten generally indicates that multicollinearity may be causing problems in estimation. With the exception of the land value for irrigated crops, all of the predictor variables had a VIF value in excess of ten. Therefore, difficulty in estimation due to high multicollinearity amongst the predictor variables is the probable cause of the unexpected coefficient signs.

Given the similarities in annual fluctuation amongst output prices paid and various input costs for each of the four main grain crops, like variables were combined as an average for each year, effectively reducing the number of variables used for the regression analysis. Using these annual averages, the regression analysis was completed at the district level with the intent of improving estimation within the model, expanding the analysis to include all areas of the state, and identifying those areas within the state where slippage is best explained by agricultural output prices and input costs. As before, output prices paid for agricultural crops were predicted to have a positive relationship with CRP slippage and input costs a negative relationship. Additionally, the annually reported total of irrigated acreage was added as a predictor variable in an attempt to determine the impact of this practice, if any, on district level CRP slippage (predicted positive relationship).

Although analysis at the district level greatly decreases the number of observations (11, with 11 years of observation), it was completed for each district in an attempt to show spatial variations in regard to relationship strengths. Initial scatterplots for each district did show some improvement with respect to linear relationships amongst the predictor variables and CRP slippage rates, however apparent non-normaility and a lack of constant variance for all datasets made further analysis difficult. Because of the small sample size, the removal of outliers as an attempt to standardize the datasets was not possible. To increase the number of observations, the datasets for all districts were combined and a statewide analysis completed. As expected, non-normality and a lack of constant variance were still present within the statewide district dataset. However, given the increased sample size (99, based on 11 years and 9 districts), I was able to standardize the dataset by removing the outliers. As most outliers were linked to those districts with extreme slippage values, all observations for the northwestern, east-central, and southeastern districts were removed from the dataset. The resulting 66 observation dataset (combining observations from the west-central, southwestern, north-central, central, south-central, and northeastern districts) showed much improvement with regards to linearity (Fig. B.7), normality, and constant variance (Fig. 6.4).

Figure 6.4 Residual Plots for District Level Regression Analysis



Satisfied that the assumptions for regression analysis had been met, the analysis was completed (alpha=0.05). Combining the like variables as district averages greatly reduced multicollinearity within the model, with VIF values for all predictor variables near one (Table 6.2). The adjusted R-squared value of 50.0 percent also showed significant improvement in regard to the amount of variance in slippage explained by the predictor variables, and the overall regression p-value (< 0.001) implies that at least one coefficient in the model is significantly different from zero. However, the p-values for the average price paid for grain crops and the average costs combined are both greater than the alpha value (0.05) indicating that they may need to be excluded from the model. A step-wise regression analysis revealed that removing these two predictor variables did not significantly impact the strength of the model. The results for the final district level model are shown in Table 6.3.

Table 6.2 District Level Regression Model Results.

Predictor	Coef	SE Coef	T	P	VIF
Constant	2.5455	0.6171	4.12	0.000	
Avg $ Paid Grain Crops	0.10644	0.08708	1.22	0.226	1.010
Avg Land Value	-0.0033618	0.0004363	-7.71	0.000	1.628
Avg Costs Combined	0.002431	0.006708	0.36	0.718	1.132
Total Irrigated Acres	-0.00000066	0.00000018	-3.75	0.000	1.492

S = 0.521398	R-Sq = 53.1%	R-Sq(adj) = 50.0%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	4	18.7816	4.6954	17.27	0.000
Residual Error	61	16.5832	0.2719		
Total	65	35.3648			

Table 6.3 District Level Regression Model Results (grain crops average price and average costs variables removed).

Predictor	Coef	SE Coef	T	P	VIF
Constant	3.1084	0.3418	9.09	0.000	
Avg Land Value	-0.0033502	0.0004087	-8.20	0.000	1.438
Total Irrigated Acres	-0.00000065	0.00000065	-3.80	0.000	1.438

S = 0.519657	R-Sq = 51.9%	R-Sq(adj) = 50.4%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	2	18.3521	9.1760	33.98	0.000
Residual Error	63	17.0127	0.2700		
Total	65	35.3648			

CHAPTER 7 - Discussion and Conclusion

Discussion of Slippage

The results of this study show that in 66 of the 105 counties in Kansas, positive average slippage rates were apparent over the period of 1995-2005. Mapping the CRP slippage rates indicates a large spatial disparity, with the vast majority of slippage occurring in the western two-thirds of the state. Annual slippage averages at the district level ranged from a high of 350 percent in the northwest (2000) to a low of -788 percent in the southeast (1999). While the statewide average slippage rate of -68 percent over the entire study period would indicate that acreage is being removed from production in excess of that which is retired under the CRP, county level calculations reveal an average slippage of 106 percent within the sixty-six county refined study area from 1995-2005.

As discussed in Chapter 3, the main differences between the eastern and western areas of Kansas include population densities, land ownership patterns, acreage in crop production, and acreage enrolled in the CRP. While a difference in the ratio of cultivated acreage to CRP acreage may have some bearing on the lack of slippage in the eastern one-third of the state, the availability of non-cropland for conversion to production is a more likely cause. If land is not available for conversion to production, then increases in the acreage under cultivation are not possible. Although when driving through parts of western Kansas it may seem like every square-inch of land is already in row crops, in comparison to eastern Kansas it is a veritable blank page of open range including over 2 million acres of CRP, much of which will be expiring in the near future. In regard to the difference in population density, the negative slippage rates in the eastern counties and their general proximity to urban centers may be indicative of urban sprawl. As developers drive up prices for land near urban centers, it is no longer economically feasible for farmers to purchase uncultivated parcels for conversion to production or even retain that land which is already in production for agricultural purposes. In addition, the smaller farm units in eastern Kansas may mean that individual farmers have less uncultivated land to open up to cultivation. Another factor may be the much greater tendency of farmers in the eastern portion of the state to enroll buffers and filter strips—basically field portions rather than entire fields—than those in central and western Kansas. In other words, the entire configuration of farmland in eastern Kansas may not be conducive to slippage. Additionally, easement programs such as the

Grassland Reserve Program (GRP) which emphasizes support for working grazing operations to keep them from being converted to cropland, may be of more interest to landowners in the eastern Flint Hills region of the state (as opposed to CRP, which has required payment reductions for grazing).

Aside from the availability of uncultivated land for conversion to production in western Kansas affecting slippage rates, the lack of precipitation in the region requires heavy use of groundwater for irrigation which may also provide incentive for cultivating new areas. As the use of groundwater for irrigation in these areas rapidly outpaces the rate of aquifer recharge, water tables drop. The lower the water table becomes, the energy costs for raising the water to the surface increase exponentially, and eventually it is no longer economically feasible to irrigate the acreage above this particular area of the aquifer. Therefore, the possibility exists for expansion of production to previously uncultivated areas with higher water tables. This seems unlikely, however—given the history of high dependence on groundwater for production in the area, those areas with the best access to groundwater generally would already be in production. Acreage data regarding specific practices such as irrigation are generally reported by NASS at the district level; however, some districts are reported at the county level. Although it would be beneficial research, the counties that are accounted for individually are not annually consistent, making it very difficult to obtain a usable dataset for the analysis of irrigated lands in relation to CRP slippage at the county level for most districts.

Discussion of Data Analysis

The goal of this study was to answer the question "Is there a relationship between fluctuations in agricultural commodity output prices, input costs and Conservation Reserve Program slippage rates in Kansas?" To accomplish this goal, the following objectives were addressed:

1) Determination of the annual slippage rates for each county in Kansas between 1995 and 2005, using agricultural statistics at the county level.
2) Refinement of the study area by excluding those counties with a negative average annual slippage value for the study period (1995-2005).

3) Collection of annual grain crop output prices, input costs and land values in Kansas between 1995 and 2005, using agricultural statistics at the district and regional-level.
4) Completion of statistical analysis to determine the strength of relationships between annual CRP slippage rates, agricultural commodity output prices and production costs.

Because linear relationships between my response variable and independent variables was a basic assumption of regression analysis that had to be met, I began by producing scatterplots of each predictor variable against slippage and included a fitted regression line within each plot. The apparent lack of any major positive or negative linear relationships was not promising, but there also did not seem to be any evidence of curvilinear relationships. As was expected, the comparison of regionally reported agricultural input cost data to county level slippage resulted in vertical bars of clustered points within the scatterplots. Additionally, the similarities in data values amongst some of the input costs for the different crops resulted in a high degree of multicollinearity within the model. Those independent variables that were shown to be highly intercorrelated were removed from the model. Given the fact that multicollinearity does not reduce the predictive power or reliability of the model as a whole, I was satisfied and proceeded with the regression analysis after removal of the highly correlated variables.

The initial regression results indicated several predictor variables that were not significant, some non-normality, and many outliers. The identified non-significant variables were removed from the model. In order to improve normality, the dataset was cleaned by removing the outlying observations as identified on the plot of standardized residuals versus fitted values. Once completed, normality was drastically improved and the altered dataset was run for analysis. While the final best fit model showed improvement, the regression analysis ultimately showed a significant lack of fit within the model, indicating the need for additional predictor variables in order to account for variations in CRP slippage rates. Although the model does indicate the presence of a minor relationship between the selected variables of agricultural commodity output prices and input costs with CRP slippage rates, further analysis is warranted to identify additional sub-regional variables impacting slippage.

Once the predictor variables were averaged, and combined in the case of input costs, multicollinearity was effectively removed from the model. The district level analysis showed great improvement in terms of the models ability to explain the variance in CRP slippage after removing the northwestern, east-central, and southeastern districts, indicating significant relationships between agricultural land values and total acreage of irrigated cropland within the remaining six districts. As the cost of acquiring agricultural land for production increases, the expansion of cropland within districts should increase. This negative relationship was apparent within the final model. On the other hand, a positive relationship was expected between total irrigated cropland and CRP slippage, and the final model indicates that there is a negative relationship. As total irrigated cropland increases, the average district level slippage should logically also increase. It is possible that areas with large amounts of irrigated acreage may have less land available for conversion to cropland, effectively reducing the ability for acreage to be slipped.

Future research pertaining to the determinants of CRP slippage, other than the economic variables examined in this study, is needed in order to identify additional contributing variables. It is possible that many farmers are utilizing the CRP as a part of their crop rotation. It would make sense for producers to enroll less productive fields in the CRP in order to improve the soil quality, with the intent of cropping it again once the contract expires. As long as general sign-ups are an option, producers will be able to continue this cycle. It will be crucial to monitor the future use of expiring acreage over the next four years, especially if no general sign-up is made available.

Analysis with respect to the impact of weather on producers planting decisions could be beneficial. Lags among variables and land use changes also should be considered. It may be helpful to explore physical characteristics of the terrain, if accurate locations of CRP tracts can be obtained. While an analysis at this level would be time consuming, site-specific (or county level generalization depending on data availability) analysis regarding soil types and terrain/slopes could indicate relationships between these physical characteristics and acreage slippage. Other characteristics that should be analyzed include farm size and farming practices, although the latter would be extremely difficult given the lack of specific data in reporting. Farm size may play a crucial role because of the disparity in federal farm program participation between large agri-business and smaller individual operations. Additional potential variables for exploration include variations in landowner characteristics. Social aspects, including factors like landowner age, education, income and income sources (including land leases for outdoor recreation) may also play a role in the decision-making associated with CRP enrollment and with slippage.

Due to a lack of consistency, both temporally and in terms of scale, in agricultural data reporting, alternative methods should be sought for identifying total acreage in production. Slippage calculations can be significantly inflated when acreage in production is overestimated, making accurate analysis of relationships difficult. A geographically-weighted regression analysis could be beneficial for future research by helping to identify those areas where relationships between individual variables and CRP acreage slippage are the strongest.

Conclusions

The results of this research have provided evidence of the effectiveness of the CRP in reducing total land in agricultural production at the county level within the state of Kansas. Although many variables affecting the occurrence of acreage slippage remain to be explained, this county level analysis and the recognized spatial relationships of slippage in relation to the CRP have helped to identify additional avenues for future research. Additionally, this study has provided an area of focus for conservation program coordinators charged with the task of assessing program compliance.

The lack of available practice-specific agricultural data at the subregional level is problematic both from a research perspective and in accurately calculating acreage slippage. Non-reporting of the practice of double-cropping can lead to over reported acreage in production total and, consequently, inflated slippage values. This is an issue of increasing concern as greater numbers of producers tend away traditional crop rotation, favoring increased fertilizer use and continuous cropping practices. In relation to research, the lack of reported data does not allow for county level analysis of variables such as irrigated cropland.

As a multiple objective program, slippage calculations alone cannot analyze the overall effectiveness of the CRP. Slippage rates do not account for, or compare, the tract-specific benefits of enrolling one property while another is converted to agricultural production. However, the conversion of unbroken or fallow acreage to agricultural production, especially in areas with suitable EBI scores for enrollment in the CRP, does negatively impact the net gain of environmental benefits for that area to some extent. Because the purpose of the CRP is to improve rather than maintain environmental benefits, enrollment in the program requires that the land be in agricultural production prior to enrollment. While this is unavoidable within the CRP, additional easement-type programs such as the Grassland Reserve Program (GRP) that serve to maintain the current state of properties, may help to curb the occurrence of land slippage.

Contract expirations over the next several years may be shifting the focus and common conservation practices applied through the CRP within Kansas. Because current national enrollment is approximately 34.7 million acres and the 2008 Farm Bill reduced the national CRP acreage cap to 32 million, there are no general sign-up periods for new enrollment predicted for the near future. In Kansas alone, 1.98 million acres currently enrolled in the CRP are set to expire by 2012. The lack of a general sign-up, compounded by the expiring acreage, has shifted the focus to enrolling expiring properties in continuous CRP practices such as field buffers in an attempt to mitigate the negative impacts of returning these lands to agricultural production. These shifts in acreage enrollment and practices may have interesting implications for future research of CRP slippage given the expected large increase of land in production and decrease in reserve acreage.

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Appendix A - Annual Slippage Calculations by County

Table A.1 Annual Slippage Calculation Data by County

Dist	County	Year	A	A*	L	S
SE	Allen	1995	137067.67	130738.06	6695.20	5.46%
		1996	137067.67	124471.75	6603.10	-90.76%
		1997	137067.67	119629.60	6439.00	-170.82%
		1998	137067.67	128364.46	3044.90	-185.83%
		1999	137067.67	122382.98	2568.40	-471.74%
		2000	137067.67	127320.08	4888.30	-99.41%
		2001	137067.67	123712.20	5308.40	-151.59%
		2002	137067.67	123997.03	5449.90	-139.83%
		2003	137067.67	128364.46	5569.70	-56.26%
		2004	137067.67	113078.46	8842.70	-171.29%
		2005	137067.67	112983.51	9428.40	-155.44%
					Average:	**-153.41%**
EC	Anderson	1995	151820.51	145209.95	8596.00	23.10%
		1996	151820.51	150453.91	8370.70	83.67%
		1997	151820.51	163611.47	8670.20	235.99%
		1998	151820.51	145209.95	4006.10	-65.01%
		1999	151820.51	144542.54	3443.00	-111.38%
		2000	151820.51	149691.15	4391.50	51.51%
		2001	151820.51	146830.81	4867.20	-2.52%
		2002	151820.51	151979.42	4722.70	103.36%
		2003	151820.51	154363.04	4803.60	152.93%
		2004	151820.51	147307.53	5302.40	14.89%
		2005	151820.51	141205.47	5997.50	-76.99%
					Average:	**37.23%**
NE	Atchison	1995	127844.88	116295.73	6035.60	-91.35%
		1996	127844.88	128938.67	6041.60	118.10%
		1997	127844.88	133088.64	6060.60	186.52%
		1998	127844.88	121700.35	6070.60	-1.22%
		1999	127844.88	117164.33	5406.80	-97.54%
		2000	127844.88	119480.59	5787.80	-44.52%
		2001	127844.88	119384.08	6242.80	-35.53%
		2002	127844.88	118322.46	6284.70	-51.52%
		2003	127844.88	118901.53	6291.40	-42.15%
		2004	127844.88	122568.95	5477.60	3.68%
		2005	127844.88	121989.88	5601.20	-4.53%
					Average:	**-5.46%**

Dist	County	Year	A	A*	L	S
SC	Barber	1995	198565.19	142949.80	27149.40	-104.85%
		1996	198565.19	155112.10	26939.10	-61.30%
		1997	198565.19	150743.95	26934.70	-77.55%
		1998	198565.19	144405.85	22682.30	-138.77%
		1999	198565.19	143121.10	20665.00	-168.30%
		2000	198565.19	128560.61	19113.80	-266.25%
		2001	198565.19	139009.91	20507.00	-190.41%
		2002	198565.19	134127.86	20426.20	-215.46%
		2003	198565.19	129674.06	20478.50	-236.41%
		2004	198565.19	129160.16	20708.30	-235.16%
		2005	198565.19	135155.66	20657.60	-206.95%
					Average:	**-172.86%**
C	Barton	1995	326066.61	326497.63	25918.20	101.66%
		1996	326066.61	351250.49	25982.60	196.93%
		1997	326066.61	336103.22	25974.70	138.64%
		1998	326066.61	340074.76	23531.50	159.53%
		1999	326066.61	323542.06	20082.00	87.43%
		2000	326066.61	318646.91	18060.70	58.92%
		2001	326066.61	314675.37	17558.70	35.12%
		2002	326066.61	309226.04	17612.70	4.38%
		2003	326066.61	307563.54	17646.60	-4.85%
		2004	326066.61	285489.16	20716.30	-95.87%
		2005	326066.61	302853.11	20217.60	-14.82%
					Average:	**60.64%**
SE	Bourbon	1995	106672.03	59576.97	21999.40	-114.07%
		1996	106672.03	66207.01	21544.40	-87.82%
		1997	106672.03	75171.57	20470.60	-53.88%
		1998	106672.03	72090.00	9351.40	-269.81%
		1999	106672.03	62751.92	7554.80	-481.35%
		2000	106672.03	61911.49	10583.30	-322.94%
		2001	106672.03	58269.64	14063.60	-244.17%
		2002	106672.03	57989.49	14263.00	-241.32%
		2003	106672.03	58456.40	14391.60	-235.03%
		2004	106672.03	51639.60	18943.30	-190.51%
		2005	106672.03	48184.51	19573.00	-198.82%
					Average:	**-221.79%**

Dist	County	Year	A	A*	L	S
NE	Brown	1995	228381.96	215002.73	10625.00	-25.92%
		1996	228381.96	244404.81	9547.50	267.82%
		1997	228381.96	240632.83	9069.40	235.08%
		1998	228381.96	229413.62	9343.30	111.04%
		1999	228381.96	226705.53	8755.80	80.85%
		2000	228381.96	229800.49	8582.50	116.53%
		2001	228381.96	225931.79	9634.60	74.57%
		2002	228381.96	222256.53	10043.30	39.01%
		2003	228381.96	224577.75	10257.30	62.91%
		2004	228381.96	225061.33	10860.60	69.42%
		2005	228381.96	222449.97	10910.10	45.63%
					Average:	**97.90%**
SE	Butler	1995	221706.84	179879.51	6810.10	-514.20%
		1996	221706.84	191286.96	6523.10	-366.34%
		1997	221706.84	188364.39	6482.60	-414.34%
		1998	221706.84	179596.68	4207.30	-900.88%
		1999	221706.84	168849.16	2966.00	-1682.12%
		2000	221706.84	179502.40	2043.00	-1965.81%
		2001	221706.84	183367.74	2124.20	-1704.87%
		2002	221706.84	186196.03	2128.00	-1568.74%
		2003	221706.84	187987.28	2148.10	-1469.74%
		2004	221706.84	178559.64	1881.10	-2193.72%
		2005	221706.84	180728.00	1858.50	-2104.94%
					Average:	**-1353.25%**
EC	Chase	1995	54750.89	45346.99	1498.30	-527.64%
		1996	54750.89	47524.40	1506.20	-379.78%
		1997	54750.89	46672.37	1506.20	-436.35%
		1998	54750.89	44873.64	1527.80	-546.50%
		1999	54750.89	43169.58	1130.00	-924.89%
		2000	54750.89	45062.98	1048.40	-824.07%
		2001	54750.89	46388.36	1125.30	-643.14%
		2002	54750.89	43642.93	1073.90	-934.36%
		2003	54750.89	42696.23	1083.90	-1012.16%
		2004	54750.89	41370.85	1095.10	-1121.81%
		2005	54750.89	46577.70	1224.90	-567.25%
					Average:	**-719.81%**

Dist	County	Year	A	A*	L	S
SE	Chautauqua	1995	30792.06	19447.62	4446.40	-155.14%
		1996	30792.06	22291.37	4421.40	-92.26%
		1997	30792.06	25869.00	4302.20	-14.43%
		1998	30792.06	22016.17	3866.60	-126.97%
		1999	30792.06	17246.00	4118.60	-228.90%
		2000	30792.06	14127.04	4209.10	-295.93%
		2001	30792.06	16603.86	4322.80	-228.22%
		2002	30792.06	15503.05	4330.10	-253.09%
		2003	30792.06	15869.99	4350.10	-243.03%
		2004	30792.06	14310.51	4317.00	-281.78%
		2005	30792.06	14035.31	4329.40	-287.05%
					Average:	**-200.62%**
SE	Cherokee	1995	216364.27	186919.57	4877.30	-503.71%
		1996	216364.27	221122.69	4785.10	199.44%
		1997	216364.27	193434.45	4726.20	-385.16%
		1998	216364.27	196787.70	1585.10	-1135.04%
		1999	216364.27	176955.64	1174.80	-3254.50%
		2000	216364.27	198416.42	1166.40	-1438.74%
		2001	216364.27	200524.17	1185.30	-1236.38%
		2002	216364.27	206655.83	1247.60	-678.17%
		2003	216364.27	217577.83	1231.30	198.56%
		2004	216364.27	217194.60	1303.60	163.69%
		2005	216364.27	196691.89	1474.70	-1233.99%
					Average:	**-845.82%**
NW	Cheyenne	1995	194887.51	192350.62	45816.30	94.46%
		1996	194887.51	192441.22	45372.10	94.61%
		1997	194887.51	191897.60	45090.50	93.37%
		1998	194887.51	191353.98	42195.10	91.63%
		1999	194887.51	199598.88	37149.90	112.68%
		2000	194887.51	188907.70	40199.60	85.12%
		2001	194887.51	191172.78	41465.90	91.04%
		2002	194887.51	173595.75	41484.20	48.68%
		2003	194887.51	193619.06	41450.10	96.94%
		2004	194887.51	205035.07	42740.70	123.74%
		2005	194887.51	197243.19	43854.10	105.37%
					Average:	**94.33%**

Dist	County	Year	A	A*	L	S
SW	Clark	1995	103448.83	73470.10	45384.30	33.94%
		1996	103448.83	83036.11	45317.00	54.96%
		1997	103448.83	84447.49	44971.80	57.75%
		1998	103448.83	81938.37	45039.80	52.24%
		1999	103448.83	73705.33	46642.00	36.23%
		2000	103448.83	70568.93	49660.50	33.79%
		2001	103448.83	80919.04	51971.10	56.65%
		2002	103448.83	105696.58	52115.50	104.31%
		2003	103448.83	75038.30	52115.40	45.49%
		2004	103448.83	72215.54	52293.00	40.27%
		2005	103448.83	76528.09	52478.30	48.70%
					Average:	**51.30%**
NC	Clay	1995	196409.69	212533.34	23369.60	168.99%
		1996	196409.69	217389.11	22993.70	191.24%
		1997	196409.69	218136.15	22579.10	196.22%
		1998	196409.69	213000.24	17263.10	196.10%
		1999	196409.69	205623.20	16947.10	154.37%
		2000	196409.69	201421.10	19052.70	126.30%
		2001	196409.69	204502.64	20351.60	139.77%
		2002	196409.69	200300.53	20525.40	118.96%
		2003	196409.69	209265.03	20499.30	162.71%
		2004	196409.69	196005.04	21669.20	98.13%
		2005	196409.69	201140.95	22389.90	121.13%
					Average:	**152.18%**
NC	Cloud	1995	227141.85	244322.70	16513.90	204.04%
		1996	227141.85	223320.48	16226.10	76.45%
		1997	227141.85	221577.94	16086.30	65.41%
		1998	227141.85	211397.83	14201.60	-10.86%
		1999	227141.85	215433.19	13249.60	11.63%
		2000	227141.85	220844.24	13817.00	54.42%
		2001	227141.85	225888.44	14763.30	91.51%
		2002	227141.85	213598.93	14706.50	7.91%
		2003	227141.85	212865.23	14772.60	3.36%
		2004	227141.85	211672.97	14987.00	-3.22%
		2005	227141.85	219651.97	15075.60	50.32%
					Average:	**50.09%**

Dist	County	Year	A	A*	L	S
EC	Coffey	1995	153175.12	141935.79	11685.20	3.82%
		1996	153175.12	139204.44	11540.10	-21.06%
		1997	153175.12	125453.53	11048.10	-150.92%
		1998	153175.12	138733.52	11410.20	-26.57%
		1999	153175.12	134024.30	11894.60	-61.00%
		2000	153175.12	141370.68	12360.60	4.50%
		2001	153175.12	138074.23	14356.90	-5.18%
		2002	153175.12	139675.36	14384.00	6.15%
		2003	153175.12	140523.02	14505.40	12.78%
		2004	153175.12	130256.93	14371.30	-59.47%
		2005	153175.12	130445.30	15031.50	-51.21%
					Average:	**-31.65%**
SC	Comanche	1995	129020.58	86049.73	41244.20	-4.19%
		1996	129020.58	95205.69	41161.00	17.85%
		1997	129020.58	89209.75	40923.30	2.72%
		1998	129020.58	83375.87	40241.90	-13.43%
		1999	129020.58	81107.14	39280.30	-21.98%
		2000	129020.58	73814.79	42146.50	-30.99%
		2001	129020.58	77460.97	42516.60	-21.27%
		2002	129020.58	83213.82	42478.50	-7.84%
		2003	129020.58	71708.11	42443.90	-35.03%
		2004	129020.58	69925.54	42571.50	-38.81%
		2005	129020.58	74544.03	42532.70	-28.08%
					Average:	**-16.46%**
SE	Cowley	1995	204030.01	178234.87	7221.20	-257.21%
		1996	204030.01	219734.06	7312.40	314.76%
		1997	204030.01	194613.71	7362.00	-27.90%
		1998	204030.01	186332.28	7205.70	-145.61%
		1999	204030.01	174462.22	6641.30	-345.21%
		2000	204030.01	172345.85	6063.20	-422.56%
		2001	204030.01	170321.50	6433.30	-423.97%
		2002	204030.01	179523.10	6200.70	-295.23%
		2003	204030.01	187804.53	6206.50	-161.43%
		2004	204030.01	184952.04	5797.80	-229.06%
		2005	204030.01	180075.19	6044.50	-296.31%
					Average:	**-208.16%**

Dist	County	Year	A	A*	L	S
SE	Crawford	1995	156881.77	139103.73	12402.60	-43.34%
		1996	156881.77	165297.97	11796.40	171.35%
		1997	156881.77	149505.77	11484.90	35.78%
		1998	156881.77	154706.80	3826.80	43.16%
		1999	156881.77	134659.22	2809.00	-691.12%
		2000	156881.77	148371.00	2224.10	-282.66%
		2001	156881.77	142035.21	3333.90	-345.32%
		2002	156881.77	144399.31	3314.10	-276.65%
		2003	156881.77	152720.95	3421.40	-21.61%
		2004	156881.77	147898.18	6138.50	-46.35%
		2005	156881.77	134091.83	6311.10	-261.11%
					Average:	**-156.17%**
NW	Decatur	1995	178322.47	188202.34	7975.10	223.88%
		1996	178322.47	203203.98	8306.40	399.55%
		1997	178322.47	201203.76	8329.20	374.71%
		1998	178322.47	201294.68	7874.10	391.74%
		1999	178322.47	195294.02	7174.60	336.55%
		2000	178322.47	193748.40	4742.60	425.26%
		2001	178322.47	198567.11	5775.60	450.52%
		2002	178322.47	190566.23	5926.40	306.60%
		2003	178322.47	197657.92	5892.20	428.15%
		2004	178322.47	201294.68	7317.70	413.93%
		2005	178322.47	207840.85	7540.20	491.48%
					Average:	**385.67%**
C	Dickinson	1995	298796.74	279336.31	23114.40	15.81%
		1996	298796.74	290695.99	23695.60	65.81%
		1997	298796.74	287343.95	24967.20	54.13%
		1998	298796.74	285761.05	26356.20	50.54%
		1999	298796.74	275332.49	27116.50	13.47%
		2000	298796.74	278218.97	29210.40	29.55%
		2001	298796.74	263134.81	32135.70	-10.97%
		2002	298796.74	258386.09	32156.90	-25.67%
		2003	298796.74	262669.24	32637.10	-10.69%
		2004	298796.74	263507.25	35808.90	1.45%
		2005	298796.74	264065.93	36939.10	5.98%
					Average:	**17.22%**

Dist	County	Year	A	A*	L	S
NE	Doniphan	1995	152874.16	136381.11	11218.30	-47.02%
		1996	152874.16	151138.05	11107.50	84.37%
		1997	152874.16	150752.24	10921.50	80.57%
		1998	152874.16	146122.62	13444.40	49.78%
		1999	152874.16	141203.64	13533.70	13.77%
		2000	152874.16	144579.41	14151.00	41.38%
		2001	152874.16	146797.77	13834.10	56.08%
		2002	152874.16	146411.97	13497.20	52.12%
		2003	152874.16	151523.85	12693.60	89.36%
		2004	152874.16	150366.44	11039.40	77.28%
		2005	152874.16	147665.83	11048.90	52.86%
					Average:	**50.05%**
EC	Douglas	1995	109442.85	75649.97	5907.10	-472.07%
		1996	109442.85	80642.10	6103.50	-371.87%
		1997	109442.85	96290.51	5580.30	-135.69%
		1998	109442.85	81026.11	4435.90	-540.61%
		1999	109442.85	78626.05	4645.40	-563.38%
		2000	109442.85	77282.01	4946.70	-550.15%
		2001	109442.85	77378.02	5603.30	-472.25%
		2002	109442.85	74977.95	5607.80	-514.59%
		2003	109442.85	75553.97	5670.30	-497.66%
		2004	109442.85	73825.92	6196.30	-474.81%
		2005	109442.85	72769.90	6180.40	-493.38%
					Average:	**-462.40%**
SC	Edwards	1995	217614.43	212506.11	48680.20	89.51%
		1996	217614.43	229131.37	48191.90	123.90%
		1997	217614.43	201825.08	47457.20	66.73%
		1998	217614.43	215478.23	40455.70	94.72%
		1999	217614.43	215385.35	35907.30	93.79%
		2000	217614.43	221701.09	33139.90	112.33%
		2001	217614.43	234425.45	34440.10	148.81%
		2002	217614.43	212320.36	34131.20	84.49%
		2003	217614.43	216778.53	34225.90	97.56%
		2004	217614.43	209719.76	34303.70	76.99%
		2005	217614.43	220122.16	34162.70	107.34%
					Average:	**99.65%**

Dist	County	Year	A	A*	L	S
SE	Elk	1995	44959.95	28497.04	8320.50	-97.86%
		1996	44959.95	24923.45	8180.80	-144.92%
		1997	44959.95	29046.82	7746.30	-105.43%
		1998	44959.95	26756.06	5815.60	-213.02%
		1999	44959.95	24556.93	5111.10	-299.19%
		2000	44959.95	25473.23	5075.40	-283.94%
		2001	44959.95	24923.45	5556.40	-260.60%
		2002	44959.95	25106.71	5600.90	-254.47%
		2003	44959.95	25473.23	5608.20	-247.47%
		2004	44959.95	22907.59	5380.10	-309.89%
		2005	44959.95	23823.89	5327.80	-296.71%
					Average:	**-228.50%**
C	Ellis	1995	158968.58	139123.38	33605.00	40.95%
		1996	158968.58	164587.93	33417.10	116.82%
		1997	158968.58	147108.78	33516.60	64.62%
		1998	158968.58	145777.88	27549.30	52.12%
		1999	158968.58	146842.60	25618.30	52.67%
		2000	158968.58	148617.13	18885.10	45.19%
		2001	158968.58	147020.05	19544.10	38.86%
		2002	158968.58	139833.20	19723.70	2.98%
		2003	158968.58	137792.48	19824.70	-6.82%
		2004	158968.58	136905.22	20472.50	-7.77%
		2005	158968.58	143825.89	21610.00	29.93%
					Average:	**39.05%**
C	Ellsworth	1995	148550.03	131308.43	28195.80	38.85%
		1996	148550.03	134666.00	28557.80	51.38%
		1997	148550.03	117515.14	29291.90	-5.95%
		1998	148550.03	125228.49	27726.80	15.89%
		1999	148550.03	125591.47	27670.60	17.03%
		2000	148550.03	133214.08	26969.50	43.14%
		2001	148550.03	127497.12	27882.60	24.49%
		2002	148550.03	127860.10	28001.60	26.11%
		2003	148550.03	128041.60	28096.40	27.01%
		2004	148550.03	126680.42	28591.00	23.51%
		2005	148550.03	126498.93	29745.60	25.87%
					Average:	**26.12%**

Dist	County	Year	A	A*	L	S
SW	Finney	1995	430166.63	366471.12	59168.40	-7.65%
		1996	430166.63	415046.22	58911.60	74.33%
		1997	430166.63	389610.86	57221.40	29.12%
		1998	430166.63	376112.68	54069.50	0.03%
		1999	430166.63	357288.68	59665.20	-22.14%
		2000	430166.63	362155.37	60860.50	-11.75%
		2001	430166.63	385937.89	65244.90	32.21%
		2002	430166.63	378867.41	65360.50	21.51%
		2003	430166.63	375194.43	65633.90	16.24%
		2004	430166.63	369776.80	72096.80	16.24%
		2005	430166.63	370144.09	77177.70	22.23%
					Average:	**15.49%**
SW	Ford	1995	317533.52	314326.71	49318.50	93.50%
		1996	317533.52	332128.97	48884.70	129.86%
		1997	317533.52	318192.86	49146.50	101.34%
		1998	317533.52	308932.09	46722.20	81.59%
		1999	317533.52	303897.11	47117.80	71.06%
		2000	317533.52	306504.51	54544.00	79.78%
		2001	317533.52	333387.72	57990.10	127.34%
		2002	317533.52	321609.46	58199.50	107.00%
		2003	317533.52	316844.20	58071.80	98.81%
		2004	317533.52	289961.00	65617.40	57.98%
		2005	317533.52	304076.93	70812.50	81.00%
					Average:	**93.57%**
EC	Franklin	1995	134773.29	113327.75	8972.60	-139.01%
		1996	134773.29	115329.34	8669.70	-124.27%
		1997	134773.29	122382.54	8690.40	-42.58%
		1998	134773.29	114757.46	5803.20	-244.91%
		1999	134773.29	109610.53	4620.40	-444.60%
		2000	134773.29	120190.32	4480.70	-225.46%
		2001	134773.29	116187.16	5199.30	-257.47%
		2002	134773.29	119237.19	5164.50	-200.82%
		2003	134773.29	120285.64	5144.30	-181.63%
		2004	134773.29	113423.07	4964.50	-330.06%
		2005	134773.29	116949.67	5311.20	-235.59%
					Average:	**-220.58%**

Dist	County	Year	A	A*	L	S
EC	Geary	1995	54786.43	54285.52	2302.20	78.24%
		1996	54786.43	56070.00	2544.60	150.44%
		1997	54786.43	48556.43	2981.80	-108.93%
		1998	54786.43	48932.11	3018.70	-93.94%
		1999	54786.43	45363.16	3154.60	-198.72%
		2000	54786.43	47053.71	3367.10	-129.65%
		2001	54786.43	45551.00	3696.40	-149.85%
		2002	54786.43	44517.89	3692.50	-178.09%
		2003	54786.43	42545.57	3787.70	-223.17%
		2004	54786.43	42545.57	3670.00	-233.54%
		2005	54786.43	42921.25	3770.40	-214.69%
					Average:	**-118.35%**
WC	Gove	1995	195994.48	186973.45	18877.40	52.21%
		1996	195994.48	246917.78	18694.10	372.40%
		1997	195994.48	195348.02	18394.80	96.49%
		1998	195994.48	204868.59	14512.70	161.15%
		1999	195994.48	206631.66	17019.00	162.50%
		2000	195994.48	211039.33	23996.90	162.69%
		2001	195994.48	231050.17	28345.30	223.67%
		2002	195994.48	202223.99	28475.60	121.88%
		2003	195994.48	201254.30	28546.50	118.43%
		2004	195994.48	204163.37	32403.70	125.21%
		2005	195994.48	206631.66	36731.70	128.96%
					Average:	**156.87%**
NW	Graham	1995	163400.94	137330.03	67815.50	61.56%
		1996	163400.94	131226.47	67793.50	52.54%
		1997	163400.94	130616.12	67352.00	51.32%
		1998	163400.94	138201.97	59355.80	57.55%
		1999	163400.94	145787.82	54891.30	67.91%
		2000	163400.94	155379.12	46424.60	82.72%
		2001	163400.94	153809.63	47399.00	79.76%
		2002	163400.94	150321.89	47272.80	72.33%
		2003	163400.94	147706.08	46972.20	66.59%
		2004	163400.94	147880.47	47506.70	67.33%
		2005	163400.94	150845.05	47845.00	73.76%
					Average:	**66.67%**

Dist	County	Year	A	A*	L	S
SW	Grant	1995	210520.37	186322.63	30019.90	19.39%
		1996	210520.37	221781.63	30012.40	137.52%
		1997	210520.37	199445.25	29849.10	62.90%
		1998	210520.37	194977.98	31426.90	50.54%
		1999	210520.37	192837.41	32204.10	45.09%
		2000	210520.37	178318.76	35616.10	9.59%
		2001	210520.37	197676.96	36998.00	65.29%
		2002	210520.37	178877.17	36992.30	14.46%
		2003	210520.37	185950.36	36997.30	33.59%
		2004	210520.37	163707.05	41728.60	-12.19%
		2005	210520.37	176736.60	41642.10	18.87%
					Average:	**40.46%**
SW	Gray	1995	333315.77	328025.04	37935.40	86.05%
		1996	333315.77	340091.61	38485.50	117.61%
		1997	333315.77	334986.52	37908.50	104.41%
		1998	333315.77	335079.34	35487.80	104.97%
		1999	333315.77	330067.07	38373.30	91.53%
		2000	333315.77	317907.69	44390.80	65.29%
		2001	333315.77	329974.25	50035.20	93.32%
		2002	333315.77	310482.10	50261.90	54.57%
		2003	333315.77	309925.19	50519.90	53.70%
		2004	333315.77	291825.33	54059.80	23.25%
		2005	333315.77	311410.30	54989.50	60.16%
					Average:	**77.72%**
WC	Greeley	1995	206666.39	183120.66	83845.90	71.92%
		1996	206666.39	247273.41	84774.40	147.90%
		1997	206666.39	202228.15	84773.70	94.76%
		1998	206666.39	199375.00	84223.00	91.34%
		1999	206666.39	197127.06	76812.10	87.58%
		2000	206666.39	196003.09	77949.70	86.32%
		2001	206666.39	258253.73	80608.80	164.00%
		2002	206666.39	297073.93	80314.80	212.57%
		2003	206666.39	238108.73	80307.80	139.15%
		2004	206666.39	224794.01	81029.90	122.37%
		2005	206666.39	217099.14	80771.60	112.92%
					Average:	**120.98%**

Dist	County	Year	A	A*	L	S
SE	Greenwood	1995	68837.86	40560.20	5173.30	-446.61%
		1996	68837.86	54482.46	4968.30	-188.94%
		1997	68837.86	54760.90	4861.60	-189.55%
		1998	68837.86	43623.09	3586.80	-602.99%
		1999	68837.86	46593.18	3753.10	-492.70%
		2000	68837.86	47150.07	3624.50	-498.37%
		2001	68837.86	47335.70	3881.10	-454.02%
		2002	68837.86	45943.47	3916.00	-484.64%
		2003	68837.86	48913.55	3933.00	-406.59%
		2004	68837.86	45665.03	3899.40	-494.27%
		2005	68837.86	47428.51	4011.40	-433.71%
					Average:	**-426.58%**
SW	Hamilton	1995	214946.87	164877.52	126699.40	60.48%
		1996	214946.87	219251.08	126674.30	103.40%
		1997	214946.87	187540.49	126229.00	78.29%
		1998	214946.87	185695.83	132092.80	77.86%
		1999	214946.87	185168.78	134674.70	77.89%
		2000	214946.87	162505.81	134015.10	60.87%
		2001	214946.87	222237.68	133714.50	105.45%
		2002	214946.87	195797.54	133988.90	85.71%
		2003	214946.87	180688.89	133676.60	74.37%
		2004	214946.87	157498.87	135206.80	57.51%
		2005	214946.87	174188.66	133826.90	69.54%
					Average:	**77.40%**
SC	Harper	1995	303994.97	264383.60	30880.10	-28.27%
		1996	303994.97	293779.41	30483.70	66.49%
		1997	303994.97	288775.87	30810.90	50.60%
		1998	303994.97	273586.54	29465.70	-3.20%
		1999	303994.97	269029.74	26521.00	-31.84%
		2000	303994.97	252857.58	24358.60	-109.94%
		2001	303994.97	255806.10	26447.30	-82.21%
		2002	303994.97	257414.38	26526.60	-75.60%
		2003	303994.97	258307.87	26779.20	-70.61%
		2004	303994.97	254644.56	27297.80	-80.79%
		2005	303994.97	260005.50	27025.00	-62.77%
					Average:	**-38.92%**

Dist	County	Year	A	A*	L	S
SC	Harvey	1995	245782.62	248851.34	6028.20	150.91%
		1996	245782.62	255115.33	5987.10	255.88%
		1997	245782.62	257488.06	5987.10	295.51%
		1998	245782.62	248661.52	5008.50	157.48%
		1999	245782.62	255684.79	4485.60	320.75%
		2000	245782.62	256823.70	3505.50	414.96%
		2001	245782.62	250559.70	3649.90	230.88%
		2002	245782.62	250369.89	3657.20	225.43%
		2003	245782.62	254545.88	3927.90	323.10%
		2004	245782.62	246763.34	4144.80	123.66%
		2005	245782.62	251413.88	4257.50	232.27%
					Average:	**248.26%**
SW	Haskell	1995	271231.98	255277.16	19365.60	17.61%
		1996	271231.98	277203.38	19519.90	130.59%
		1997	271231.98	278602.92	19164.20	138.46%
		1998	271231.98	271791.80	21770.40	102.57%
		1999	271231.98	272444.92	21818.70	105.56%
		2000	271231.98	253504.40	26405.20	32.86%
		2001	271231.98	255090.55	26842.20	39.87%
		2002	271231.98	266660.13	26817.30	82.95%
		2003	271231.98	250985.22	26541.60	23.72%
		2004	271231.98	244174.10	27557.80	1.81%
		2005	271231.98	253970.92	27778.40	37.86%
					Average:	**64.90%**
SW	Hodgeman	1995	166668.57	155131.12	26837.30	57.01%
		1996	166668.57	170474.74	27584.70	113.80%
		1997	166668.57	160572.75	27754.70	78.04%
		1998	166668.57	157182.88	31552.20	69.94%
		1999	166668.57	158967.03	42825.00	82.02%
		2000	166668.57	153346.98	55616.50	76.05%
		2001	166668.57	158342.58	63622.80	86.91%
		2002	166668.57	147816.14	63781.20	70.44%
		2003	166668.57	150135.52	63885.50	74.12%
		2004	166668.57	135683.98	73453.70	57.82%
		2005	166668.57	138003.36	78921.40	63.68%
					Average:	**75.44%**

Dist	County	Year	A	A*	L	S
NE	Jackson	1995	117137.48	88256.43	20934.60	-37.96%
		1996	117137.48	95184.09	20078.00	-9.34%
		1997	117137.48	88920.73	19557.40	-44.28%
		1998	117137.48	84745.16	17937.40	-80.59%
		1999	117137.48	83606.36	17387.20	-92.85%
		2000	117137.48	83131.87	17972.80	-89.21%
		2001	117137.48	80474.68	20446.60	-79.31%
		2002	117137.48	79335.89	20672.80	-82.86%
		2003	117137.48	79905.29	20772.60	-79.24%
		2004	117137.48	78386.90	20403.10	-89.92%
		2005	117137.48	77532.80	20645.10	-91.84%
					Average:	**-70.67%**
NE	Jefferson	1995	118890.94	93177.91	14837.90	-73.29%
		1996	118890.94	107307.35	14744.10	21.44%
		1997	118890.94	111985.34	14083.80	50.97%
		1998	118890.94	97760.43	11513.80	-83.52%
		1999	118890.94	92605.10	11144.10	-135.87%
		2000	118890.94	91364.00	11205.90	-145.65%
		2001	118890.94	92318.69	12214.00	-117.56%
		2002	118890.94	89072.74	12368.80	-141.08%
		2003	118890.94	90695.71	12404.70	-127.29%
		2004	118890.94	90409.30	12167.00	-134.09%
		2005	118890.94	90313.84	12084.20	-136.48%
					Average:	**-92.95%**
NC	Jewell	1995	247060.66	238633.15	25862.10	67.41%
		1996	247060.66	217486.06	26038.50	-13.58%
		1997	247060.66	225944.90	26319.90	19.77%
		1998	247060.66	231208.18	23857.90	33.55%
		1999	247060.66	233463.87	22199.50	38.75%
		2000	247060.66	244742.31	23052.30	89.94%
		2001	247060.66	251697.36	24582.40	118.86%
		2002	247060.66	246622.05	24649.40	98.22%
		2003	247060.66	240700.87	24759.50	74.31%
		2004	247060.66	241452.77	23492.10	76.13%
		2005	247060.66	243144.53	22756.40	82.79%
					Average:	**62.38%**

Dist	County	Year	A	A*	L	S
EC	Johnson	1995	76598.85	49522.64	2321.50	-1066.32%
		1996	76598.85	54886.79	1816.90	-1095.01%
		1997	76598.85	51917.35	1869.30	-1220.36%
		1998	76598.85	47606.87	1704.60	-1600.81%
		1999	76598.85	49522.64	1870.60	-1347.46%
		2000	76598.85	49235.27	1972.70	-1287.11%
		2001	76598.85	50863.68	2079.00	-1137.86%
		2002	76598.85	50001.58	2062.00	-1189.88%
		2003	76598.85	52300.50	2069.80	-1073.95%
		2004	76598.85	45116.37	1847.70	-1603.87%
		2005	76598.85	43296.39	1771.10	-1780.33%
					Average:	**-1309.36%**
SW	Kearny	1995	230792.62	196810.13	73545.70	53.79%
		1996	230792.62	235178.44	71597.60	106.13%
		1997	230792.62	213740.03	70322.40	75.75%
		1998	230792.62	210427.66	67032.40	69.62%
		1999	230792.62	213556.01	65614.50	73.73%
		2000	230792.62	202790.80	64885.50	56.84%
		2001	230792.62	233982.31	65374.60	104.88%
		2002	230792.62	200950.60	65366.80	54.35%
		2003	230792.62	204907.04	65583.60	60.53%
		2004	230792.62	188161.16	66395.10	35.79%
		2005	230792.62	209599.57	65922.20	67.85%
					Average:	**69.02%**
SC	Kingman	1995	278567.15	230697.05	45580.30	-5.02%
		1996	278567.15	280500.36	45647.00	104.24%
		1997	278567.15	280040.07	45463.90	103.24%
		1998	278567.15	270005.76	33418.70	74.38%
		1999	278567.15	270650.17	32225.40	75.43%
		2000	278567.15	238061.68	31404.70	-28.98%
		2001	278567.15	231065.28	33431.90	-42.09%
		2002	278567.15	225725.92	33297.90	-58.69%
		2003	278567.15	231249.40	33112.00	-42.90%
		2004	278567.15	225725.92	31984.70	-65.21%
		2005	278567.15	230512.93	32802.20	-46.50%
					Average:	**6.17%**

Dist	County	Year	A	A*	L	S
SC	Kiowa	1995	152870.22	123121.20	56238.00	47.10%
		1996	152870.22	139471.12	55634.30	75.92%
		1997	152870.22	139471.12	54742.50	75.52%
		1998	152870.22	135677.22	50096.40	65.68%
		1999	152870.22	140374.43	50111.90	75.06%
		2000	152870.22	131070.33	49405.20	55.88%
		2001	152870.22	130980.00	54436.80	59.79%
		2002	152870.22	129986.36	54358.20	57.90%
		2003	152870.22	127728.08	54031.70	53.47%
		2004	152870.22	120591.93	63478.40	49.15%
		2005	152870.22	120049.95	64860.90	49.40%
					Average:	**60.44%**
SE	Labette	1995	166590.31	152545.01	7117.80	-97.33%
		1996	166590.31	161474.47	6871.60	25.55%
		1997	166590.31	145010.77	6750.50	-219.67%
		1998	166590.31	145382.83	6225.10	-240.68%
		1999	166590.31	116734.14	4499.80	-1007.96%
		2000	166590.31	140825.08	4634.30	-455.97%
		2001	166590.31	139336.84	5119.20	-432.38%
		2002	166590.31	143522.53	5040.30	-357.67%
		2003	166590.31	149754.55	5104.10	-229.85%
		2004	166590.31	146964.09	5447.50	-260.28%
		2005	166590.31	134407.03	5657.80	-468.83%
					Average:	**-340.46%**
WC	Lane	1995	165151.50	166984.22	24729.40	107.41%
		1996	165151.50	219127.99	24751.20	318.08%
		1997	165151.50	160776.63	24859.30	82.40%
		1998	165151.50	171772.93	23279.20	128.44%
		1999	165151.50	171772.93	27232.70	124.31%
		2000	165151.50	163082.31	34286.00	93.96%
		2001	165151.50	190750.43	39225.30	165.26%
		2002	165151.50	158027.55	38967.80	81.72%
		2003	165151.50	161397.39	38839.00	90.33%
		2004	165151.50	147829.37	40606.80	57.34%
		2005	165151.50	162727.59	41403.30	94.15%
					Average:	**122.13%**

Dist	County	Year	A	A*	L	S
NE	Leavenworth	1995	92273.95	57615.58	5876.40	-489.79%
		1996	92273.95	63529.76	5690.50	-405.13%
		1997	92273.95	73068.76	5259.70	-265.14%
		1998	92273.95	59523.38	4889.50	-569.81%
		1999	92273.95	60191.11	5115.90	-527.12%
		2000	92273.95	62003.52	5945.70	-409.11%
		2001	92273.95	59237.21	6849.80	-382.30%
		2002	92273.95	58283.31	7074.50	-380.47%
		2003	92273.95	58760.26	7046.20	-375.63%
		2004	92273.95	55898.56	6780.20	-436.49%
		2005	92273.95	26899.99	6830.70	-857.06%
					Average:	**-463.46%**
C	Lincoln	1995	174238.98	157505.01	19197.60	12.83%
		1996	174238.98	160773.13	18805.60	28.39%
		1997	174238.98	153147.53	18676.30	-12.93%
		1998	174238.98	159411.42	18202.80	18.54%
		1999	174238.98	158322.04	19156.40	16.91%
		2000	174238.98	161045.47	17617.40	25.11%
		2001	174238.98	156415.64	18433.70	3.31%
		2002	174238.98	155961.74	18298.60	0.12%
		2003	174238.98	156143.30	18495.10	2.16%
		2004	174238.98	153147.53	18658.60	-13.04%
		2005	174238.98	156869.55	18135.10	4.22%
					Average:	**7.78%**
EC	Linn	1995	114239.21	78856.22	26420.10	-33.92%
		1996	114239.21	77345.20	26007.90	-41.86%
		1997	114239.21	84144.78	25322.10	-18.85%
		1998	114239.21	83200.40	16720.00	-85.64%
		1999	114239.21	75928.62	16389.50	-133.75%
		2000	114239.21	78950.66	17519.50	-101.42%
		2001	114239.21	82161.57	19210.80	-66.98%
		2002	114239.21	79895.05	19143.40	-79.40%
		2003	114239.21	80839.43	19355.30	-72.56%
		2004	114239.21	76873.01	19210.30	-94.51%
		2005	114239.21	74795.36	19432.80	-102.98%
					Average:	**-75.62%**

Dist	County	Year	A	A*	L	S
WC	Logan	1995	192358.11	158472.96	33639.30	-0.73%
		1996	192358.11	199545.86	32473.60	122.13%
		1997	192358.11	162323.54	32395.60	7.29%
		1998	192358.11	181405.33	24962.00	56.12%
		1999	192358.11	179266.12	18969.70	30.98%
		2000	192358.11	179693.96	19310.20	34.42%
		2001	192358.11	224360.74	21151.00	251.31%
		2002	192358.11	179950.67	21144.10	41.32%
		2003	192358.11	190218.89	21294.80	89.95%
		2004	192358.11	196465.40	23921.60	117.17%
		2005	192358.11	200144.84	24985.50	131.17%
					Average:	**80.10%**
EC	Lyon	1995	147832.26	129270.78	21982.30	15.56%
		1996	147832.26	129647.66	21454.80	15.24%
		1997	147832.26	129553.44	21167.10	13.65%
		1998	147832.26	119848.71	15556.00	-79.89%
		1999	147832.26	124748.19	13305.60	-73.49%
		2000	147832.26	124088.64	11944.20	-98.79%
		2001	147832.26	123900.20	13285.90	-80.13%
		2002	147832.26	123523.32	13303.60	-82.72%
		2003	147832.26	123900.20	13341.80	-79.38%
		2004	147832.26	118435.40	13631.20	-115.66%
		2005	147832.26	120602.48	13792.30	-97.43%
					Average:	**-60.28%**
C	McPherson	1995	362068.00	350928.90	16163.60	31.09%
		1996	362068.00	370335.55	15821.30	152.26%
		1997	362068.00	363708.89	15237.90	110.77%
		1998	362068.00	362856.89	12340.80	106.39%
		1999	362068.00	348372.91	9931.90	-37.89%
		2000	362068.00	353958.23	8685.40	6.63%
		2001	362068.00	345154.24	9326.00	-81.36%
		2002	362068.00	341367.58	9386.70	-120.53%
		2003	362068.00	344586.24	9127.60	-91.53%
		2004	362068.00	339095.59	10210.70	-124.98%
		2005	362068.00	344964.91	10189.80	-67.85%
					Average:	**-10.64%**

Dist	County	Year	A	A*	L	S
C	Marion	1995	293843.36	268390.86	18350.70	-38.70%
		1996	293843.36	309228.82	18114.80	184.93%
		1997	293843.36	296977.44	18000.80	117.41%
		1998	293843.36	292323.81	17304.20	91.22%
		1999	293843.36	280737.22	16029.50	18.24%
		2000	293843.36	266016.56	14220.00	-95.69%
		2001	293843.36	255474.67	15570.80	-146.41%
		2002	293843.36	263357.35	15598.60	-95.44%
		2003	293843.36	270955.11	15751.90	-45.30%
		2004	293843.36	261742.82	16144.80	-98.83%
		2005	293843.36	269720.47	16639.30	-44.98%
					Average:	**-13.96%**
NE	Marshall	1995	296957.57	309412.88	21725.90	157.33%
		1996	296957.57	331241.46	21750.30	257.62%
		1997	296957.57	305695.35	22180.10	139.39%
		1998	296957.57	296353.87	21527.20	97.20%
		1999	296957.57	292922.30	19987.70	79.81%
		2000	296957.57	315418.12	21327.80	186.56%
		2001	296957.57	312272.52	23013.50	166.55%
		2002	296957.57	302454.43	23149.30	123.75%
		2003	296957.57	315513.45	23268.60	179.75%
		2004	296957.57	302549.75	23985.80	123.31%
		2005	296957.57	301310.57	24363.50	117.87%
					Average:	**148.10%**
SW	Meade	1995	235944.65	204755.87	35185.70	11.36%
		1996	235944.65	211205.59	35136.70	29.59%
		1997	235944.65	221288.95	34803.60	57.89%
		1998	235944.65	219381.29	37596.00	55.94%
		1999	235944.65	213022.41	41531.90	44.81%
		2000	235944.65	199759.60	46886.90	22.82%
		2001	235944.65	196580.17	51442.90	23.48%
		2002	235944.65	194127.46	51442.30	18.71%
		2003	235944.65	198306.15	51439.90	26.83%
		2004	235944.65	177412.69	60173.80	2.73%
		2005	235944.65	186951.01	63166.10	22.44%
					Average:	**28.78%**

Dist	County	Year	A	A*	L	S
EC	Miami	1995	107409.57	71319.95	11668.10	-209.30%
		1996	107409.57	93279.24	11199.80	-26.17%
		1997	107409.57	93852.09	10175.40	-33.24%
		1998	107409.57	87073.36	6297.00	-222.95%
		1999	107409.57	68360.22	5982.40	-552.74%
		2000	107409.57	71224.48	5975.70	-505.54%
		2001	107409.57	71224.48	6306.80	-473.75%
		2002	107409.57	70651.63	6307.20	-482.79%
		2003	107409.57	74852.54	6370.20	-411.08%
		2004	107409.57	69505.93	6451.50	-487.52%
		2005	107409.57	75711.81	6649.30	-376.71%
					Average:	**-343.80%**
NC	Mitchell	1995	247547.03	265340.34	20502.40	186.79%
		1996	247547.03	275704.48	20397.00	238.05%
		1997	247547.03	268733.90	20885.10	201.44%
		1998	247547.03	250482.01	19582.30	114.99%
		1999	247547.03	263230.82	16374.90	195.78%
		2000	247547.03	274970.73	16591.20	265.29%
		2001	247547.03	285151.44	16876.40	322.82%
		2002	247547.03	263047.38	16998.00	191.19%
		2003	247547.03	266349.23	17217.80	209.20%
		2004	247547.03	262313.64	16429.00	189.88%
		2005	247547.03	272219.19	16208.40	252.22%
					Average:	**215.24%**
SE	Montgomery	1995	123396.09	114667.40	3883.00	-124.79%
		1996	123396.09	117423.83	3492.00	-71.03%
		1997	123396.09	110624.64	3125.60	-308.61%
		1998	123396.09	104192.98	2906.10	-560.79%
		1999	123396.09	86643.72	2297.30	-1499.81%
		2000	123396.09	103825.45	2169.20	-802.21%
		2001	123396.09	104560.50	2381.10	-691.05%
		2002	123396.09	103733.57	2406.90	-716.92%
		2003	123396.09	106398.12	2342.70	-625.57%
		2004	123396.09	108603.26	2379.30	-521.73%
		2005	123396.09	98955.76	2384.10	-925.14%
					Average:	**-622.51%**

Dist	County	Year	A	A*	L	S
EC	Morris	1995	126272.43	110718.26	5951.70	-161.34%
		1996	126272.43	112494.99	5921.60	-132.66%
		1997	126272.43	109409.09	6033.40	-179.50%
		1998	126272.43	105668.61	4582.30	-349.64%
		1999	126272.43	98187.65	4171.90	-573.19%
		2000	126272.43	105575.10	4072.70	-408.20%
		2001	126272.43	104546.47	4391.00	-394.78%
		2002	126272.43	104359.44	4412.50	-396.61%
		2003	126272.43	102395.69	4482.70	-432.64%
		2004	126272.43	98468.18	4603.90	-503.93%
		2005	126272.43	100618.96	4779.30	-436.76%
					Average:	**-360.84%**
SW	Morton	1995	202085.83	144019.24	87942.40	33.97%
		1996	202085.83	187260.32	86919.40	82.94%
		1997	202085.83	168198.95	85842.00	60.52%
		1998	202085.83	161315.67	95765.30	57.43%
		1999	202085.83	157168.06	96773.90	53.58%
		2000	202085.83	138459.68	96578.60	34.12%
		2001	202085.83	148255.10	96566.30	44.26%
		2002	202085.83	153814.67	96626.70	50.04%
		2003	202085.83	145254.70	96445.40	41.07%
		2004	202085.83	123810.66	98806.30	20.78%
		2005	202085.83	134312.06	95908.50	29.33%
					Average:	**46.19%**
NE	Nemaha	1995	217570.51	201654.62	32453.00	50.96%
		1996	217570.51	208283.57	31824.50	70.82%
		1997	217570.51	213855.74	31447.20	88.19%
		1998	217570.51	194641.38	29313.70	21.78%
		1999	217570.51	193200.31	25720.10	5.25%
		2000	217570.51	209628.58	26086.60	69.56%
		2001	217570.51	210012.87	28302.90	73.30%
		2002	217570.51	204536.78	28285.70	53.92%
		2003	217570.51	208475.72	28390.00	67.96%
		2004	217570.51	212126.44	29426.00	81.50%
		2005	217570.51	206362.14	29690.20	62.25%
					Average:	**58.68%**

Dist	County	Year	A	A*	L	S
SE	Neosho	1995	135696.04	113173.10	17193.60	-31.00%
		1996	135696.04	105820.57	17283.60	-72.85%
		1997	135696.04	113359.24	16124.90	-38.52%
		1998	135696.04	115499.85	8187.20	-146.68%
		1999	135696.04	103493.82	7382.60	-336.19%
		2000	135696.04	115685.99	6764.50	-195.81%
		2001	135696.04	115872.13	6950.40	-185.22%
		2002	135696.04	114476.08	6998.30	-203.22%
		2003	135696.04	119315.72	6965.60	-135.16%
		2004	135696.04	105541.36	9450.50	-219.08%
		2005	135696.04	101911.63	9382.70	-260.07%
					Average:	**-165.80%**
WC	Ness	1995	205617.60	185468.77	38969.40	48.30%
		1996	205617.60	231330.78	39228.80	165.55%
		1997	205617.60	192848.86	39178.40	67.41%
		1998	205617.60	203479.71	41346.50	94.83%
		1999	205617.60	213934.84	42040.70	119.78%
		2000	205617.60	210156.94	38720.90	111.72%
		2001	205617.60	225532.13	41225.30	148.31%
		2002	205617.60	198208.22	41616.20	82.20%
		2003	205617.60	190652.41	41728.70	64.14%
		2004	205617.60	179230.83	61997.40	57.44%
		2005	205617.60	185117.34	68811.80	70.21%
					Average:	**93.62%**
NW	Norton	1995	168778.41	173598.06	42925.30	111.23%
		1996	168778.41	183990.45	42552.70	135.75%
		1997	168778.41	183357.87	42515.50	134.29%
		1998	168778.41	178929.81	36584.80	127.75%
		1999	168778.41	185797.82	34678.80	149.08%
		2000	168778.41	185797.82	27870.60	161.07%
		2001	168778.41	193027.31	29699.70	181.65%
		2002	168778.41	177755.02	29450.10	130.48%
		2003	168778.41	193569.52	28897.00	185.79%
		2004	168778.41	204323.38	30424.60	216.83%
		2005	168778.41	197907.21	30103.30	196.76%
					Average:	**157.33%**

Dist	County	Year	A	A*	L	S
EC	Osage	1995	143610.21	114286.33	16522.30	-77.48%
		1996	143610.21	138776.25	15640.10	69.09%
		1997	143610.21	134262.43	14802.50	36.85%
		1998	143610.21	120432.82	14244.70	-62.71%
		1999	143610.21	113518.02	13832.00	-117.55%
		2000	143610.21	120048.66	15065.70	-56.39%
		2001	143610.21	119280.35	16427.80	-48.10%
		2002	143610.21	118608.08	16551.30	-51.06%
		2003	143610.21	118608.08	16583.90	-50.76%
		2004	143610.21	113421.98	16599.20	-81.87%
		2005	143610.21	113806.13	16570.20	-79.87%
					Average:	**-47.26%**
NC	Osborne	1995	189004.48	187890.39	22384.90	95.02%
		1996	189004.48	208395.74	22231.00	187.23%
		1997	189004.48	206047.11	22144.70	176.96%
		1998	189004.48	191052.01	20413.40	110.03%
		1999	189004.48	188342.05	19568.80	96.61%
		2000	189004.48	191232.67	14596.90	115.26%
		2001	189004.48	187980.72	14685.90	93.03%
		2002	189004.48	179218.53	14580.00	32.88%
		2003	189004.48	177411.89	14600.90	20.60%
		2004	189004.48	174521.27	15439.40	6.19%
		2005	189004.48	180663.84	15192.60	45.10%
					Average:	**88.99%**
NC	Ottawa	1995	192073.96	188357.38	17574.80	78.85%
		1996	192073.96	197679.29	17405.20	132.20%
		1997	192073.96	187991.81	17382.60	76.52%
		1998	192073.96	178121.56	14821.10	5.86%
		1999	192073.96	184153.38	14498.10	45.37%
		2000	192073.96	179309.65	15544.50	17.89%
		2001	192073.96	181228.86	16269.80	33.34%
		2002	192073.96	173460.60	16263.80	-14.45%
		2003	192073.96	172820.87	16218.40	-18.71%
		2004	192073.96	171541.39	15710.00	-30.70%
		2005	192073.96	174100.34	15872.10	-13.24%
					Average:	**28.45%**

Dist	County	Year	A	A*	L	S
SC	Pawnee	1995	272663.16	246719.86	58898.50	55.95%
		1996	272663.16	265607.07	58298.50	87.90%
		1997	272663.16	242796.43	58574.60	49.01%
		1998	272663.16	236956.91	55418.30	35.57%
		1999	272663.16	246537.38	46646.90	43.99%
		2000	272663.16	249730.87	28918.20	20.70%
		2001	272663.16	253745.54	31434.80	39.82%
		2002	272663.16	244712.53	31482.90	11.22%
		2003	272663.16	246446.14	31390.10	16.48%
		2004	272663.16	243252.65	31989.60	8.06%
		2005	272663.16	246446.14	31850.90	17.69%
					Average:	**35.13%**
NC	Phillips	1995	171393.56	165677.42	27002.10	78.83%
		1996	171393.56	174206.27	27149.40	110.36%
		1997	171393.56	188088.33	26776.30	162.35%
		1998	171393.56	188632.72	23019.80	174.89%
		1999	171393.56	189177.12	21428.30	182.99%
		2000	171393.56	194983.99	18567.40	227.05%
		2001	171393.56	182281.45	18844.00	157.78%
		2002	171393.56	174659.93	19178.00	117.03%
		2003	171393.56	176020.92	18953.20	124.41%
		2004	171393.56	176565.31	19545.10	126.46%
		2005	171393.56	174659.93	19277.20	116.94%
					Average:	**143.55%**
NE	Pottawatomie	1995	123325.63	102211.51	14408.10	-46.54%
		1996	123325.63	110273.27	14490.80	9.93%
		1997	123325.63	113728.30	14607.10	34.30%
		1998	123325.63	102499.43	13526.40	-53.97%
		1999	123325.63	96453.12	13134.30	-104.60%
		2000	123325.63	101539.70	12793.90	-70.28%
		2001	123325.63	94149.76	13529.20	-115.65%
		2002	123325.63	92518.21	13725.40	-124.46%
		2003	123325.63	92422.24	13773.30	-124.37%
		2004	123325.63	88391.37	13926.60	-150.85%
		2005	123325.63	91846.40	13782.60	-128.40%
					Average:	**-79.54%**

Dist	County	Year	A	A*	L	S
SC	Pratt	1995	277908.01	264577.31	47173.80	71.74%
		1996	277908.01	263558.99	47041.30	69.50%
		1997	277908.01	259115.43	47381.30	60.34%
		1998	277908.01	245692.16	47669.90	32.42%
		1999	277908.01	252820.38	45897.60	45.34%
		2000	277908.01	268928.30	47577.00	81.13%
		2001	277908.01	269946.62	47864.20	83.37%
		2002	277908.01	270779.79	47766.10	85.08%
		2003	277908.01	278926.33	47824.10	102.13%
		2004	277908.01	267539.69	50204.10	79.35%
		2005	277908.01	263558.99	49780.70	71.18%
					Average:	**71.05%**
NW	Rawlins	1995	199901.74	217944.92	12952.90	239.30%
		1996	199901.74	220709.36	12919.90	261.05%
		1997	199901.74	220976.88	12695.70	266.00%
		1998	199901.74	218301.62	8388.80	319.34%
		1999	199901.74	213575.32	6866.70	299.13%
		2000	199901.74	226773.29	5676.90	573.35%
		2001	199901.74	225435.66	6152.30	515.03%
		2002	199901.74	221422.76	6133.20	450.89%
		2003	199901.74	226238.24	6191.60	525.36%
		2004	199901.74	231856.30	6174.20	617.55%
		2005	199901.74	235155.79	6213.90	667.34%
					Average:	**430.39%**
SC	Reno	1995	466831.88	397593.20	95910.80	27.81%
		1996	466831.88	441116.44	95263.10	73.01%
		1997	466831.88	435045.60	93661.20	66.06%
		1998	466831.88	410015.07	89475.40	36.50%
		1999	466831.88	405438.59	81684.80	24.84%
		2000	466831.88	404504.61	82105.60	24.09%
		2001	466831.88	391615.76	85218.60	11.74%
		2002	466831.88	396565.82	85101.10	17.43%
		2003	466831.88	391522.36	84986.90	11.39%
		2004	466831.88	377979.72	89241.50	0.44%
		2005	466831.88	386105.30	87718.40	7.97%
					Average:	**27.39%**

Dist	County	Year	A	A*	L	S
NC	Republic	1995	262647.02	275546.42	15074.30	185.57%
		1996	262647.02	281061.15	14236.50	229.34%
		1997	262647.02	277067.73	14352.00	200.48%
		1998	262647.02	265943.18	11578.30	128.47%
		1999	262647.02	268605.47	10979.60	154.27%
		2000	262647.02	271648.08	11724.60	176.77%
		2001	262647.02	277638.22	12520.70	219.73%
		2002	262647.02	264421.88	12555.70	114.14%
		2003	262647.02	261189.10	12466.90	88.31%
		2004	262647.02	260143.21	12816.80	80.46%
		2005	262647.02	259667.80	13162.40	77.37%
					Average:	**150.45%**
C	Rice	1995	279695.86	267725.91	16486.10	27.39%
		1996	279695.86	267255.88	16403.00	24.16%
		1997	279695.86	273272.20	16512.90	61.10%
		1998	279695.86	264905.76	16166.00	8.51%
		1999	279695.86	268947.97	14831.70	27.53%
		2000	279695.86	278348.46	13681.10	90.15%
		2001	279695.86	279382.51	14799.90	97.88%
		2002	279695.86	270358.05	14776.00	36.80%
		2003	279695.86	267631.90	14806.10	18.52%
		2004	279695.86	271768.12	15211.90	47.88%
		2005	279695.86	276656.37	15437.20	80.31%
					Average:	**47.30%**
NE	Riley	1995	88252.34	77342.63	4105.10	-165.76%
		1996	88252.34	88661.06	4424.00	109.24%
		1997	88252.34	85359.85	4533.80	36.20%
		1998	88252.34	75739.18	4030.20	-210.48%
		1999	88252.34	78097.19	3883.60	-161.49%
		2000	88252.34	83567.76	4141.80	-13.10%
		2001	88252.34	81021.12	4208.70	-71.82%
		2002	88252.34	78002.87	4130.80	-148.12%
		2003	88252.34	76776.70	4144.30	-176.90%
		2004	88252.34	77342.63	4423.60	-146.63%
		2005	88252.34	66495.79	4439.40	-390.08%
					Average:	**-121.72%**

Dist	County	Year	A	A*	L	S
NC	Rooks	1995	165678.33	155144.39	42737.50	75.35%
		1996	165678.33	152995.82	42816.00	70.38%
		1997	165678.33	159352.00	43225.50	85.36%
		1998	165678.33	164633.89	34872.30	97.00%
		1999	165678.33	163201.51	29691.90	91.66%
		2000	165678.33	177793.86	27481.60	144.09%
		2001	165678.33	176719.57	28598.50	138.61%
		2002	165678.33	163917.70	28657.40	93.86%
		2003	165678.33	160068.18	28749.00	80.49%
		2004	165678.33	152816.77	28557.30	54.96%
		2005	165678.33	157113.91	28774.60	70.24%
					Average:	**91.09%**
C	Rush	1995	178719.37	164678.40	36285.40	61.30%
		1996	178719.37	188089.87	36591.00	125.61%
		1997	178719.37	164323.68	36899.00	60.99%
		1998	178719.37	178689.81	36218.80	99.92%
		1999	178719.37	178069.05	33925.80	98.08%
		2000	178719.37	186316.27	19858.60	138.25%
		2001	178719.37	190395.55	23168.10	150.40%
		2002	178719.37	176206.78	23396.70	89.26%
		2003	178719.37	172038.83	23603.30	71.70%
		2004	178719.37	164146.32	30311.50	51.92%
		2005	178719.37	168225.59	35366.60	70.33%
					Average:	**92.52%**
C	Russell	1995	161306.97	137438.59	51490.70	53.65%
		1996	161306.97	144923.76	51946.70	68.46%
		1997	161306.97	125805.01	52289.50	32.10%
		1998	161306.97	127608.66	45991.80	26.73%
		1999	161306.97	129051.59	44201.90	27.03%
		2000	161306.97	133921.46	39141.20	30.03%
		2001	161306.97	134282.19	40866.70	33.87%
		2002	161306.97	133109.81	41211.90	31.58%
		2003	161306.97	135274.20	41163.60	36.76%
		2004	161306.97	126436.29	43950.80	20.66%
		2005	161306.97	129141.77	45229.10	28.88%
					Average:	**35.43%**

Dist	County	Year	A	A*	L	S
C	Saline	1995	211041.21	191048.48	21671.30	7.75%
		1996	211041.21	206111.91	22058.70	77.65%
		1997	211041.21	216858.39	21999.80	126.44%
		1998	211041.21	221083.50	19596.30	151.25%
		1999	211041.21	207948.92	19305.30	83.98%
		2000	211041.21	202529.75	18521.50	54.05%
		2001	211041.21	212541.43	18816.60	107.97%
		2002	211041.21	192150.68	19002.60	0.59%
		2003	211041.21	192701.78	19058.40	3.77%
		2004	211041.21	194263.23	19201.60	12.62%
		2005	211041.21	196375.79	19278.50	23.93%
					Average:	**59.09%**
WC	Scott	1995	223059.25	220664.30	21088.40	88.64%
		1996	223059.25	265120.48	21609.00	294.65%
		1997	223059.25	208809.32	21791.20	34.61%
		1998	223059.25	240871.66	14418.30	223.54%
		1999	223059.25	258205.08	15388.60	328.39%
		2000	223059.25	249942.52	14858.40	280.93%
		2001	223059.25	289908.17	15586.90	528.88%
		2002	223059.25	260091.10	15605.60	337.30%
		2003	223059.25	250930.43	15628.70	278.33%
		2004	223059.25	257845.84	17140.10	302.95%
		2005	223059.25	258474.51	17423.30	303.26%
					Average:	**272.86%**
SC	Sedgwick	1995	380955.72	354893.79	7641.30	-241.07%
		1996	380955.72	364396.52	7539.30	-119.64%
		1997	380955.72	373052.46	7496.20	-5.43%
		1998	380955.72	364114.26	5926.10	-184.19%
		1999	380955.72	365525.55	4740.40	-225.50%
		2000	380955.72	350942.17	3694.60	-712.36%
		2001	380955.72	341439.44	3934.00	-904.48%
		2002	380955.72	337205.56	3949.70	-1007.68%
		2003	380955.72	342192.13	4144.70	-835.26%
		2004	380955.72	323939.38	4107.60	-1288.07%
		2005	380955.72	337205.56	4200.60	-941.52%
					Average:	**-587.75%**

Dist	County	Year	A	A*	L	S
SW	Seward	1995	192417.34	170338.14	43063.10	48.73%
		1996	192417.34	192206.49	43386.90	99.51%
		1997	192417.34	152807.32	42608.40	7.04%
		1998	192417.34	165729.52	41049.70	34.99%
		1999	192417.34	169524.85	40241.40	43.11%
		2000	192417.34	173049.09	43660.70	55.64%
		2001	192417.34	173229.82	44294.70	56.68%
		2002	192417.34	177567.35	44291.20	66.47%
		2003	192417.34	178742.09	44300.00	69.13%
		2004	192417.34	156783.38	51489.40	30.79%
		2005	192417.34	152084.40	53454.40	24.55%
					Average:	**48.79%**
EC	Shawnee	1995	101418.61	87442.08	6371.10	-119.37%
		1996	101418.61	94704.71	6263.40	-7.19%
		1997	101418.61	90250.29	6522.90	-71.22%
		1998	101418.61	84924.36	5634.10	-192.76%
		1999	101418.61	83375.00	5256.10	-243.29%
		2000	101418.61	83956.01	5506.50	-217.13%
		2001	101418.61	80760.46	6366.40	-224.49%
		2002	101418.61	82697.16	6531.60	-186.63%
		2003	101418.61	83278.17	6456.80	-180.95%
		2004	101418.61	81050.96	6553.90	-210.77%
		2005	101418.61	79017.42	6433.50	-248.20%
					Average:	**-172.91%**
NW	Sheridan	1995	202458.57	226288.77	9058.20	363.08%
		1996	202458.57	238241.60	8851.60	504.25%
		1997	202458.57	234347.87	8601.70	470.73%
		1998	202458.57	236611.67	4535.10	853.08%
		1999	202458.57	241410.91	4146.50	1039.40%
		2000	202458.57	256714.15	5802.30	1035.07%
		2001	202458.57	251190.50	7498.90	749.85%
		2002	202458.57	244670.77	7528.20	660.72%
		2003	202458.57	247025.12	7473.40	696.34%
		2004	202458.57	272289.05	10290.10	778.62%
		2005	202458.57	261151.19	10234.90	673.46%
					Average:	**711.33%**

Dist	County	Year	A	A*	L	S
NW	Sherman	1995	285606.34	284281.53	39100.80	96.61%
		1996	285606.34	313397.39	38684.60	171.84%
		1997	285606.34	308127.96	39037.40	157.69%
		1998	285606.34	297053.21	37859.70	130.23%
		1999	285606.34	311700.46	40951.70	163.72%
		2000	285606.34	297231.84	41198.70	128.22%
		2001	285606.34	314558.45	43043.80	167.26%
		2002	285606.34	292855.53	42972.40	116.87%
		2003	285606.34	305805.83	42755.60	147.24%
		2004	285606.34	341798.75	45404.90	223.76%
		2005	285606.34	302501.27	46248.10	136.53%
					Average:	**149.09%**
NC	Smith	1995	218029.04	217440.03	21664.00	97.28%
		1996	218029.04	227298.30	21543.50	143.03%
		1997	218029.04	223113.18	21506.50	123.64%
		1998	218029.04	210557.84	16153.90	53.75%
		1999	218029.04	217347.02	16387.80	95.84%
		2000	218029.04	238179.60	14362.90	240.30%
		2001	218029.04	237063.57	14758.50	228.97%
		2002	218029.04	233343.47	14782.60	203.60%
		2003	218029.04	222462.17	14776.30	130.00%
		2004	218029.04	223113.18	15472.30	132.86%
		2005	218029.04	232320.44	16084.90	188.85%
					Average:	**148.92%**
SC	Stafford	1995	294016.86	265634.35	35838.40	20.80%
		1996	294016.86	263410.69	36144.40	15.32%
		1997	294016.86	264337.21	38296.80	22.50%
		1998	294016.86	265541.69	39089.90	27.15%
		1999	294016.86	267580.05	39071.60	32.34%
		2000	294016.86	249976.10	38300.20	-14.99%
		2001	294016.86	263225.38	40867.40	24.66%
		2002	294016.86	251180.58	41094.60	-4.24%
		2003	294016.86	253682.19	41209.60	2.12%
		2004	294016.86	257388.29	43479.90	15.76%
		2005	294016.86	253960.15	43709.50	8.36%
					Average:	**13.62%**

Dist	County	Year	A	A*	L	S
SW	Stanton	1995	253438.54	196581.78	99898.10	43.09%
		1996	253438.54	223408.99	99583.30	69.84%
		1997	253438.54	193862.81	98842.40	39.73%
		1998	253438.54	210811.08	99287.50	57.07%
		1999	253438.54	212261.20	99667.80	58.69%
		2000	253438.54	198938.23	101719.30	46.42%
		2001	253438.54	233106.66	101731.80	80.01%
		2002	253438.54	215252.07	101702.30	62.45%
		2003	253438.54	218696.10	101702.30	65.84%
		2004	253438.54	191597.00	103658.20	40.34%
		2005	253438.54	207548.31	101759.50	54.90%
					Average:	**56.22%**
SW	Stevens	1995	306743.89	253447.30	68055.50	21.69%
		1996	306743.89	278052.92	66596.00	56.92%
		1997	306743.89	295922.40	65335.60	83.44%
		1998	306743.89	265422.66	57031.90	27.55%
		1999	306743.89	281233.88	52335.50	51.26%
		2000	306743.89	270194.09	53443.30	31.61%
		2001	306743.89	279549.84	54502.20	50.10%
		2002	306743.89	297793.56	55285.60	83.81%
		2003	306743.89	285537.52	55155.80	61.55%
		2004	306743.89	274310.62	62042.00	47.72%
		2005	306743.89	255786.23	62377.40	18.31%
					Average:	**48.54%**
SC	Sumner	1995	517416.35	520700.46	7957.80	141.27%
		1996	517416.35	587917.32	7993.80	981.95%
		1997	517416.35	539392.27	8040.40	373.32%
		1998	517416.35	520240.07	7318.10	138.59%
		1999	517416.35	515452.02	7248.00	72.90%
		2000	517416.35	524475.65	6029.90	217.07%
		2001	517416.35	520240.07	6182.00	145.68%
		2002	517416.35	500811.63	6675.20	-148.75%
		2003	517416.35	527882.53	6731.70	255.48%
		2004	517416.35	506980.85	7073.90	-47.52%
		2005	517416.35	516741.11	7559.60	91.07%
					Average:	**201.91%**

Dist	County	Year	A	A*	L	S
NW	Thomas	1995	314214.25	327170.92	18333.40	170.67%
		1996	314214.25	320632.88	18188.70	135.29%
		1997	314214.25	350546.67	17695.80	305.32%
		1998	314214.25	344725.12	17001.50	279.46%
		1999	314214.25	353054.41	15436.00	351.62%
		2000	314214.25	356009.97	15272.10	373.67%
		2001	314214.25	365951.38	16055.80	422.23%
		2002	314214.25	347322.43	16316.00	302.92%
		2003	314214.25	361115.02	16519.60	383.91%
		2004	314214.25	368727.81	21280.30	356.17%
		2005	314214.25	375534.54	21860.60	380.51%
					Average:	**314.71%**
WC	Trego	1995	158304.87	136507.30	32713.30	33.37%
		1996	158304.87	162936.86	32546.90	114.23%
		1997	158304.87	147496.91	32048.20	66.28%
		1998	158304.87	147133.62	28470.20	60.76%
		1999	158304.87	141320.93	26984.40	37.06%
		2000	158304.87	146679.50	21962.10	47.07%
		2001	158304.87	137869.65	22889.50	10.72%
		2002	158304.87	142683.28	23180.20	32.61%
		2003	158304.87	135417.42	23395.50	2.17%
		2004	158304.87	135144.95	24823.00	6.70%
		2005	158304.87	149949.14	24821.10	66.34%
					Average:	**43.39%**
EC	Wabaunsee	1995	84658.41	69119.24	13697.00	-13.45%
		1996	84658.41	72442.28	14026.30	12.91%
		1997	84658.41	77284.42	13633.40	45.91%
		1998	84658.41	65321.48	11661.50	-65.82%
		1999	84658.41	66365.86	10686.00	-71.18%
		2000	84658.41	65226.53	11856.90	-63.89%
		2001	84658.41	67220.36	13043.40	-33.69%
		2002	84658.41	69499.01	13071.10	-15.98%
		2003	84658.41	66935.53	13083.90	-35.46%
		2004	84658.41	63612.49	13185.30	-59.62%
		2005	84658.41	62283.27	13091.90	-70.91%
					Average:	**-33.74%**

Dist	County	Year	A	A*	L	S
WC	Wallace	1995	161749.67	147509.99	68266.80	79.14%
		1996	161749.67	160352.46	68067.50	97.95%
		1997	161749.67	117009.13	67250.10	33.47%
		1998	161749.67	133597.32	62888.60	55.23%
		1999	161749.67	148045.09	53637.70	74.45%
		2000	161749.67	134845.89	62844.30	57.19%
		2001	161749.67	158301.23	63649.70	94.58%
		2002	161749.67	153574.49	64322.50	87.29%
		2003	161749.67	156428.37	64202.40	91.71%
		2004	161749.67	155001.43	65254.00	89.66%
		2005	161749.67	159460.62	66355.40	96.55%
					Average:	**77.93%**
NC	Washington	1995	279500.37	266430.78	28712.00	54.48%
		1996	279500.37	262746.10	29157.70	42.54%
		1997	279500.37	279752.32	29681.40	100.85%
		1998	279500.37	277106.91	26172.80	90.86%
		1999	279500.37	274461.49	23067.30	78.16%
		2000	279500.37	261517.87	24847.60	27.63%
		2001	279500.37	263501.93	25923.90	38.29%
		2002	279500.37	258211.11	26144.40	18.57%
		2003	279500.37	256416.00	26026.00	11.30%
		2004	279500.37	258966.94	26787.20	23.35%
		2005	279500.37	256604.96	28070.30	18.44%
					Average:	**45.86%**
WC	Wichita	1995	212718.75	203651.46	45830.70	80.22%
		1996	212718.75	263223.59	46549.20	208.50%
		1997	212718.75	214078.85	46492.50	102.93%
		1998	212718.75	216436.34	43637.10	108.52%
		1999	212718.75	224415.56	45635.60	125.63%
		2000	212718.75	220244.61	43851.50	117.16%
		2001	212718.75	245179.67	44521.60	172.91%
		2002	212718.75	231578.73	44532.00	142.35%
		2003	212718.75	224868.93	44519.20	127.29%
		2004	212718.75	208094.43	45419.50	89.82%
		2005	212718.75	225140.95	45663.70	127.20%
					Average:	**127.50%**

Dist	County	Year	A	A*	L	S
SE	Wilson	1995	136194.05	131725.08	11283.70	60.39%
		1996	136194.05	132287.61	10717.80	63.55%
		1997	136194.05	138662.92	10490.70	123.53%
		1998	136194.05	133693.93	6788.70	63.17%
		1999	136194.05	129474.97	4897.80	-37.19%
		2000	136194.05	135850.28	4031.00	91.47%
		2001	136194.05	135756.53	4177.30	89.53%
		2002	136194.05	136131.54	4165.40	98.50%
		2003	136194.05	137444.11	4181.90	129.89%
		2004	136194.05	129193.71	4849.00	-44.37%
		2005	136194.05	129849.99	4929.30	-28.70%
					Average:	**55.44%**
SE	Woodson	1995	78393.72	72182.45	4337.00	-43.22%
		1996	78393.72	72841.22	4268.70	-30.07%
		1997	78393.72	71994.23	4046.80	-58.14%
		1998	78393.72	71523.68	2455.00	-179.84%
		1999	78393.72	72653.00	1819.60	-215.49%
		2000	78393.72	71806.01	1595.50	-312.89%
		2001	78393.72	71523.68	1707.10	-302.44%
		2002	78393.72	71429.57	1732.30	-302.02%
		2003	78393.72	74158.76	1764.90	-139.95%
		2004	78393.72	64465.42	4974.70	-179.98%
		2005	78393.72	67194.61	4736.00	-136.47%
					Average:	**-172.77%**
NE	Wyandotte	1995	10346.74	7063.05	169.80	-1833.86%
		1996	10346.74	6784.24	169.80	-1998.06%
		1997	10346.74	11059.24	169.80	519.61%
		1998	10346.74	7248.91	165.80	-1768.41%
		1999	10346.74	8271.20	147.80	-1304.29%
		2000	10346.74	8271.20	350.40	-492.34%
		2001	10346.74	7434.78	127.00	-2192.88%
		2002	10346.74	7341.85	127.00	-2266.06%
		2003	10346.74	7527.72	127.00	-2119.70%
		2004	10346.74	8085.33	50.40	-4386.93%
		2005	10346.74	371.74	50.40	-19691.67%
					Average:	**-3412.24%**

Appendix B - Scatterplots for Regression Variables

Figure B.1 Scatterplots: Output Prices vs. Slippage

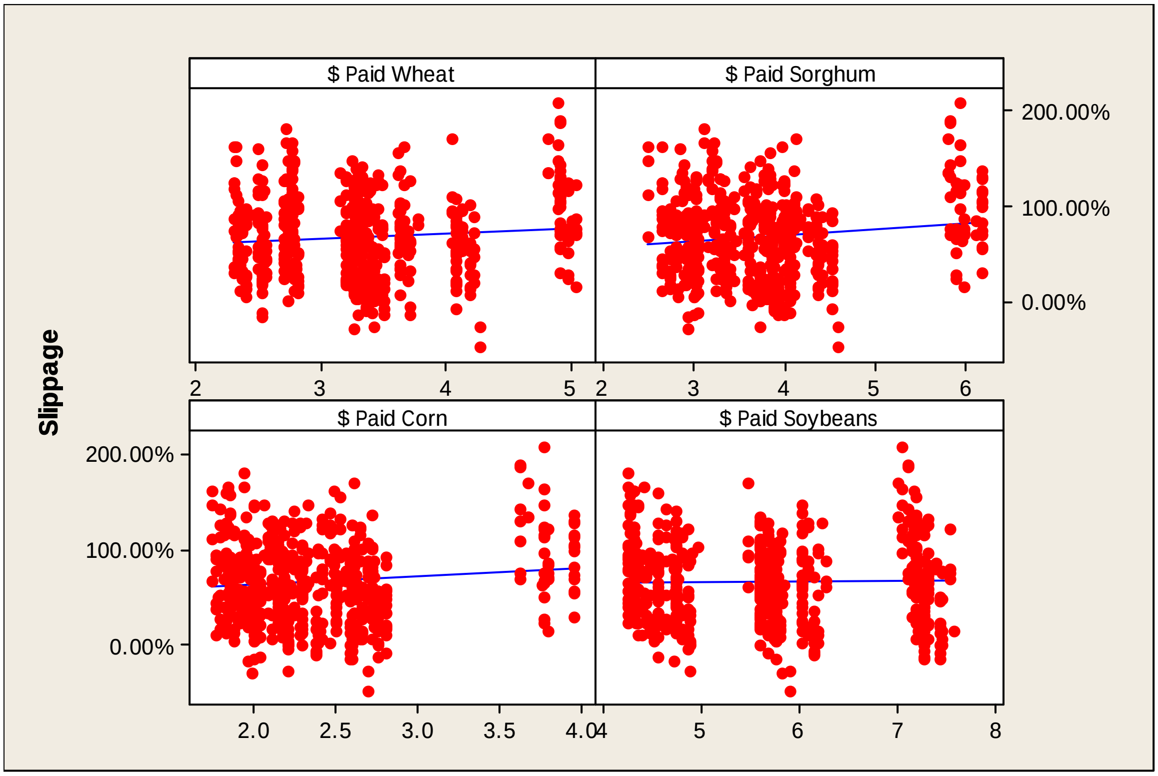

Figure B.2 Scatterplots: Land Values vs. Slippage

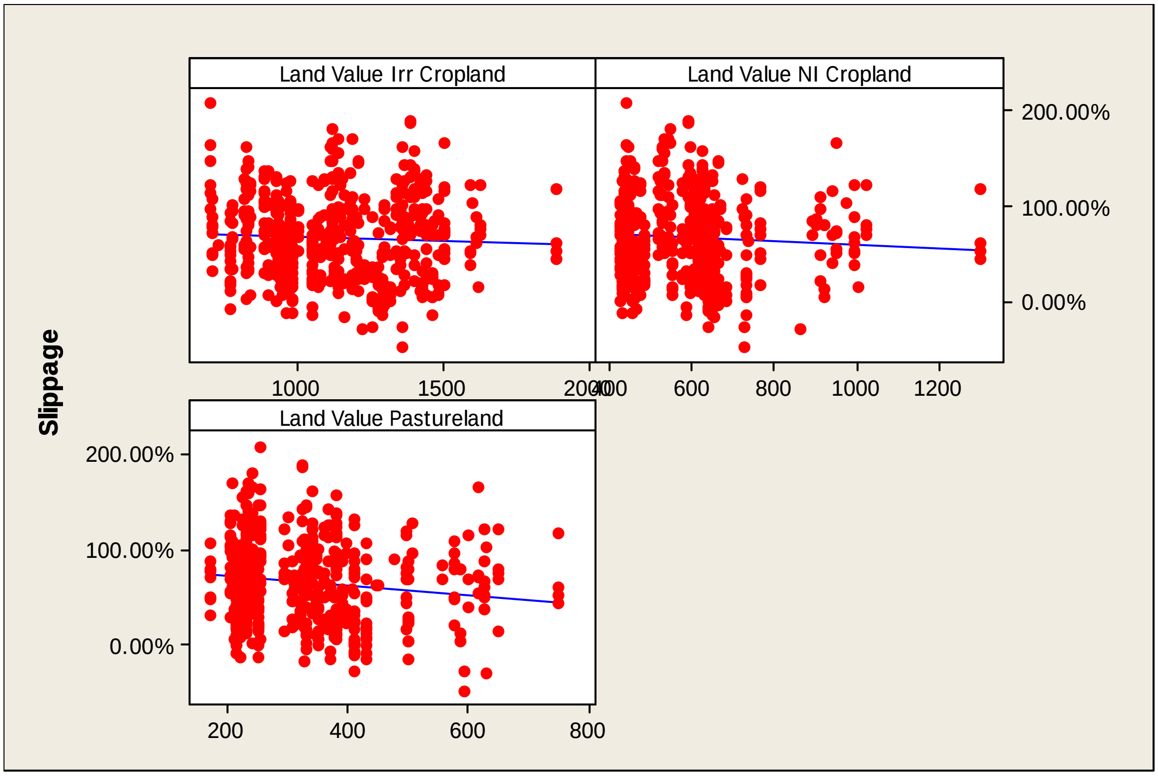

Figure B.3 Scatterplots: Wheat Input Costs vs. Slippage

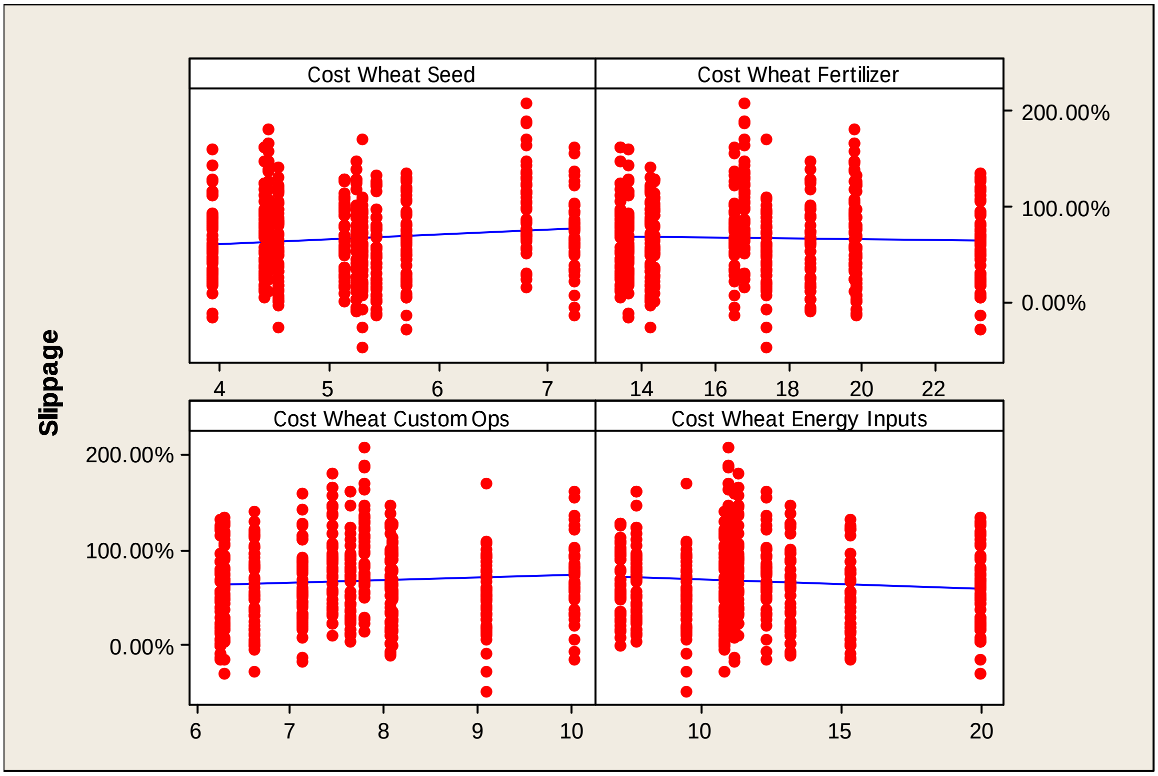

Figure B.4 Scatterplots: Input Costs vs. Slippage

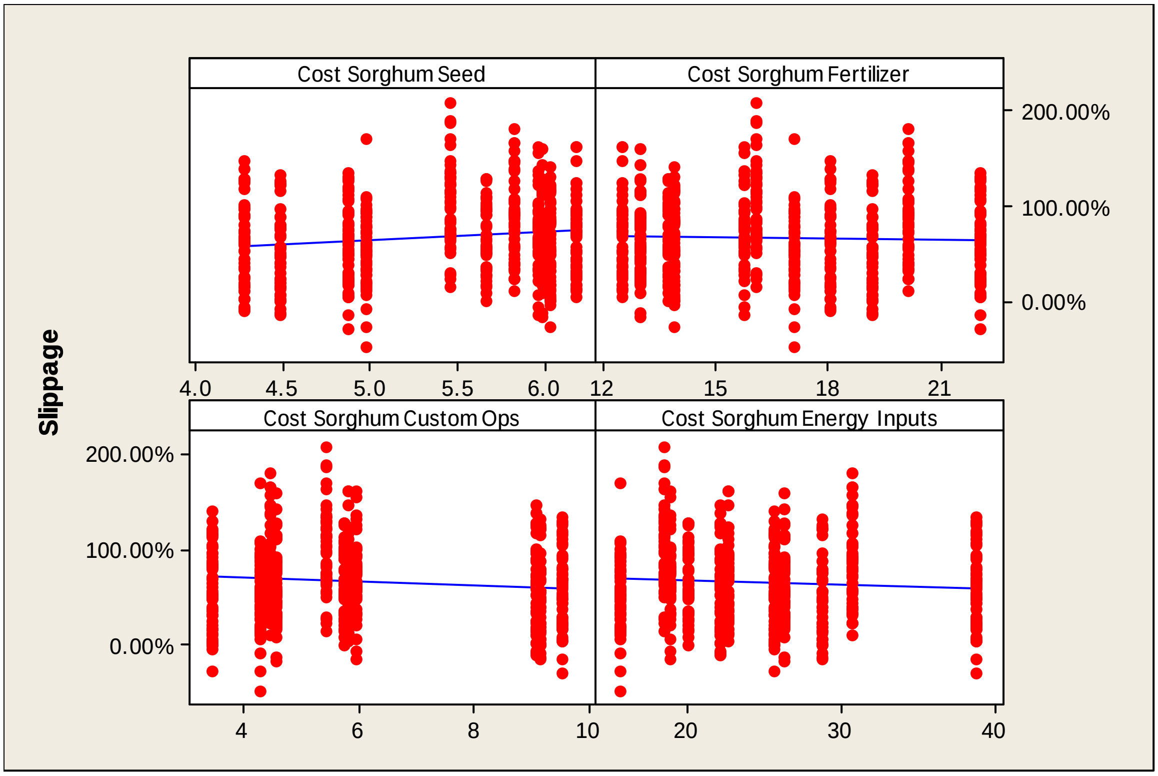

Figure B.5 Scatterplots: Corn Input Costs vs. Slippage

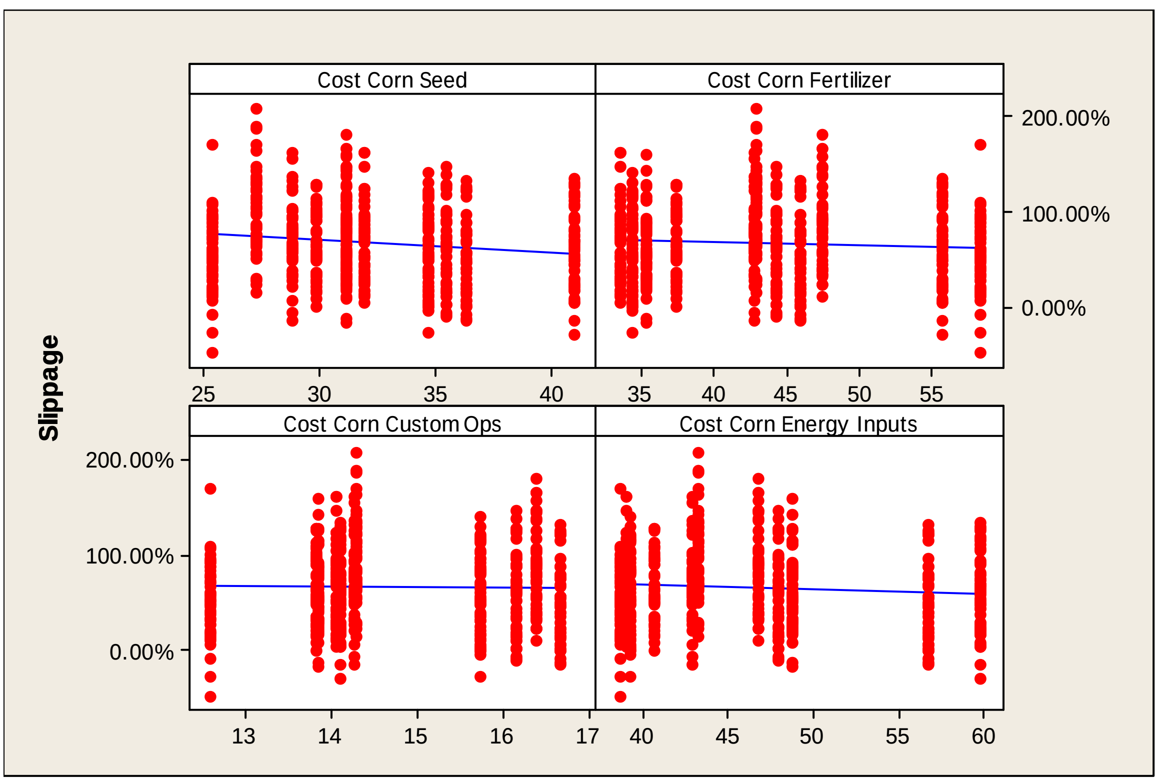

Figure B.6 Scatterplots: Soybean Input Costs vs. Slippage

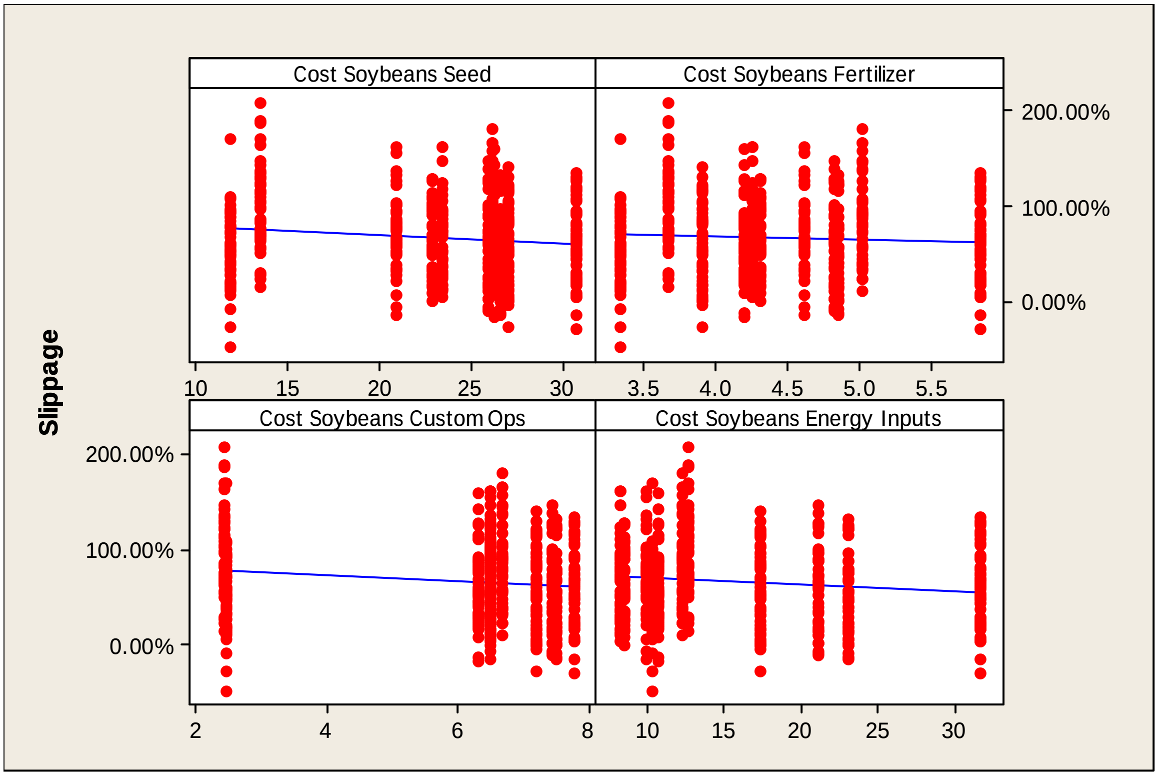

Figure B.7 Scatterplots: Combined Variables at District Level