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## **Comparing Commodity Programs under the 2002 Farm Bill to the USDA Proposal for Marketing Loan, Direct Payment, and Counter-Cyclical Payment Programs**

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### **Introduction**

The current farm bill, the Farm Security and Rural Investment Act (FSRIA) of 2002, was to expire in September 2007. A number of organizations (e.g., the National Corn Growers Association, American Farm Bureau Federation, and American Farmland Trust) have developed detailed proposals to supersede FSRIA. In addition, the Secretary of Agriculture has proposed a number of significant modifications to existing programs. The Secretary (USDA) proposes fairly comprehensive changes with respect to the commodity title of FSRIA, modifying all three primary commodity support programs: direct payments, counter-cyclical payments, and marketing loan/loan deficiency payments.

A common theme in the USDA proposal and those of the National Corn Growers Association (NCGA), American Farmland Trust (AFT), and American Farm Bureau Federation (AFBF) is the development of revenue-triggered programs. The USDA and AFT proposals incorporate a national-level revenue trigger. That is, an expected level of revenue is projected in terms of national average revenue. A shortfall in the expected level of national average revenue triggers a revenue counter-cyclical payment. USDA also proposes converting the current fixed loan rates to moving average loan rates with maximum rates for most crops set below current loan rate levels. Moreover, the proposal includes adjustments to direct payment rates for some crops. While the next Farm Bill is unlikely to incorporate all of the specific details of the USDA proposal, the concept of a revenue-triggered support program continues to be discussed as a feature the Farm Bill currently being debated in Congress. Thus, a consideration of a revenue-based program taking the USDA proposal as an example is instructive.

This paper evaluates the impact of USDA's proposed farm bill changes on average farm-level revenue and addresses three specific objectives. First, we develop forecasts of average per acre program payments from 2008-2012 for all counties that produce cotton, corn, soybeans, or wheat as reported by the National Agricultural Statistics Service (NASS) of USDA. Second, we aggregate county-level payments to assess the impact of proposed changes on USDA baseline spending. Finally, we illustrate how the proposed changes result in different regional impacts by calculating average annual per acre payments from 2008-2012 for individual counties. This analysis does not attempt to quantify the effect of more stringent payment limits and/or adjusted gross income restrictions on total payments, though some modification of existing limits is a possibility in the next Farm Bill.

The model employed in this study simulates representative crop revenue from each of hundreds of counties in the U.S. The individual county models incorporate important characteristics such

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as price and yield risk and include county and other aggregate stochastic variables. The simulation, by design, maintains price-yield correlations and spatial correlations across regions.

## **Background and Review of Literature**

### ***Current Commodity Programs***

Commodity price support currently consists primarily of three separate programs: marketing assistance loans, direct payments (DPs), and price counter-cyclical payments (PCCPs)<sup>2</sup>. Under the marketing assistance loan program, producers can receive a loan deficiency payment (LDP) equal to the difference between a posted county price (PCP) and the loan rate for the crop in question. For example, if the PCP for cotton in Washington County, Mississippi, is \$0.49 per pound, a producer can establish an LDP rate on that day of \$0.03 per pound (\$0.52 loan rate – \$0.49 PCP). The producer receives an LDP for all of his or her actual production. Thus, if the producer harvests 1,000 acres of cotton with a yield of 1,000 pounds per acre, the total LDP received by the producer equals \$0.03 per pound × 1,000 pounds × 1,000 acres, or \$30,000.

In contrast to LDPs, DPs and PCCPs are paid on historical measures known as base acres and program yields. For example, if a farm has corn base acres the farmer can receive a corn DP and—if prices fall below a specified level—a corn PCCP. The producer can receive these payments for corn and plant other crops on the base acres or idle these acres<sup>3</sup>. The DP is calculated as:

$$1) \quad DP = Rate_{DP} \times 0.85 \times Base\ Acres \times Yield_{DP}$$

where  $Rate_{DP}$  equals the direct payment rate (in dollars per unit) for an eligible crop and  $Yield_{DP}$  equals the program yield for the crop. The 2002 farm bill establishes direct payment rates for the major program crops.

Similar to DPs, PCCPs are paid on 85 percent of base acres, but the PCCP payment rate varies with market prices. The formula for calculating the PCCP is:

$$2) \quad PCCP = \max(0, (TP - Rate_{DP}) - \max(Rate_{LR}, MYA)) \times 0.85 \times Base\ Acres \times Yield_{CCP}$$

where  $TP$  is the target price,  $Rate_{DP}$  is the direct payment rate,  $Rate_{LR}$  is the loan rate,  $MYA$  is the national marketing year average price calculated by NASS, and  $Yield_{CCP}$  is the program yield for the crop according to FSRIA<sup>4</sup>. As evident from equation 2, the PCCP reaches a maximum when the marketing year average price is less than or equal to the loan rate.

Marketing year average prices below the loan rate, therefore, do not affect the size of the PCCP the producer receives. Conversely, when marketing year average prices are greater than or equal to  $TP - Rate_{DP}$ , the total PCCP equals zero.

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<sup>2</sup> USDA generally refers to the Direct Payment and Counter-Cyclical Payment programs as a single program referenced by the abbreviation DCP. To facilitate discussion of the calculation of the payments under each of these programs, we refer to them separately.

<sup>3</sup> USDA rules prevent producers from receiving DPs and CCPs while planting most fruit and vegetable crops on base acres, however.

<sup>4</sup> Depending on the option chosen by a producer during program sign-up in 2002,  $Yield_{CCP}$  may equal  $Yield_{DP}$  or  $Yield_{CCP}$  may be greater than  $Yield_{DP}$ .

### **USDA Proposal**

The USDA proposal recommends changes to all three primary commodity support programs. For the DP and marketing loan programs, changes would consist of adjusting payment rates. Notably, for the marketing loan program, loan rates would be set at 85 percent of the five-year Olympic average of marketing year average prices, in lieu of the current fixed loan rates. Maximum rates would be established at the level proposed in the version of the 2002 farm bill initially passed by the House of Representatives.<sup>5</sup>

For counter-cyclical payments, USDA proposes moving from a payment triggered by declines in the marketing year average price (the PCCP) to a payment triggered by declines in national average revenue. The revenue counter-cyclical payment (RCCP) proposed by USDA would be calculated as follows:

$$3) \quad RCCP = [\max(0, ((TP - Rate_{DP}) \times 2006 \text{ Yield}_{NP}) - (\max(Rate_{LR}, MYA) \times 2006 \text{ Yield}_{NA})) / \text{Yield}_{NCCP}] \times 0.85 \times \text{Base Acres} \times \text{Yield}_{CCP},$$

where  $\text{Yield}_{NP}$  is the national predicted yield (i.e., Olympic average of national average yield for 2002 through 2006),  $\text{Yield}_{NA}$  is the national yield in a given year,  $\text{Yield}_{NCCP}$  is the national average counter-cyclical base yield, and other variables are as previously defined.

### **Related Policy Analysis**

The PCCP program has received considerable attention since its implementation in the 2002 farm bill, as it is the newest commodity program.<sup>6</sup> Prior to the development of PCCPs, Miller, Barnett, and Coble (2003) conclude that the assumption that producers prefer PCCPs to fixed payments is often overstated. Significantly, their approach to analyzing farm programs differs from other methodologies in that it includes producer risk aversion and yield-price correlations. Including these correlations reveals that program changes can affect different regions of the country in different ways. These geographic differences will be an important consideration in the debate over revenue-based farm programs.

Public discourse about a potential RCCP program is ongoing as the Congress continues to debate the next farm bill. USDA's inclusion of the RCCP in its proposal focuses attention on this potential change. The current WTO commitments of the United States provide another incentive for a revenue-based program. Babcock and Hart (2005) note that such a program can "meet the proposed U.S. limits on trade-distorting subsidies with a high degree of probability." Coble and Miller (2006) note, however, that since the details of how a revenue-based support program might be implemented are unknown, the classification of such a program by WTO is also unknown.

Notably, proposals for revenue-based programs have thus far mostly emanated from the Corn Belt. Producers of crops traditionally grown in the South (specifically, cotton and rice) tend to express preferences for price-based programs. These producers observe a much lower correlation between prices and yields; thus, they logically perceive price risk and yield risk as two separate issues. Coble and Miller (2006) point out that revenue risk tends to be greatest for crops and regions where yield risk is greatest. Such a relationship may imply important

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<sup>5</sup> A comparison of current and proposed DP rates and loan rates can be found in the USDA proposal.

<sup>6</sup> Previous programs based payments on price shortfalls from a target level, but the programs were linked to production, with payments actually more similar to LDPs than to current CCPs.

differences about the geographic distribution of program benefits under a revenue-based program.

### **Data and Methods**

We use a non-parametric approach to simulate revenue for a representative acre in each county for which NASS data are available for the crops simulated (corn, soybeans, cotton, and wheat). Briefly, the model randomly draws (with replacement) from historical distributions of price and yield changes (1975-2004) to simulate 500 possible five-year time paths for yield and price outcomes.<sup>7</sup> For every location, yields and prices are drawn simultaneously, thus maintaining the empirical price-yield correlation for a particular location. Starting prices were defined according to December 2006 futures prices for 2007 harvest time delivery months and 2006 marketing year average prices. For yields, de-trended NASS county-level yields from 1975-2004 set the starting point for simulation. The variability of the county-level data increases by an expansion factor derived from the county crop insurance effective premium rate for 65 percent coverage<sup>8</sup>. This resulting yield series maintains a level of variability consistent with the farm level.

Simulated prices and yields are used to calculate revenue from crop returns, commodity programs, and crop insurance. Alternative commodity program specifications can be used to evaluate the impact on revenue for a representative acre in each county across crops and geographic regions.

### **Results**

Table 1 reports national average revenue from different commodity programs and includes program payments under current provisions as well as those proposed by USDA for the 2007 farm bill. The model finds continuing current policy results in low per-acre LDPs and CCPs for both corn and soybeans. For cotton, counter-cyclical payments approximately equal direct payments. Crop insurance subsidy values are highest for cotton and lowest for soybeans among the crops investigated.

#### ***USDA-proposed RCCP with National-Level Trigger***

The RCCP program represents a significant programmatic change, but RCCPs result in only a slightly higher payment relative to current price-triggered CCPs. The relatively small variation arises in large part because of an upward trend in expected yields, which effectively reduces the RCCP guarantee over time. Cotton direct payments increase over the current policy as the direct payment rate increases. The USDA proposal allows producers to purchase a layer of area insurance (GRP) to protect against small losses that do not reach the trigger for individual coverage. Assuming a 40 percent participation rate, the subsidized value of this program falls somewhere between \$5 and \$11 per acre for all three crops.

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<sup>7</sup> A detailed description of the model used in this analysis can be found in Coble and Dismukes (2007).

<sup>8</sup> Data on county premium rates are readily available from USDA's Risk Management Agency (RMA). For a detailed explanation of the process for obtaining yield expansion factors from this data, see Coble, Zuniga, and Heifner (2003).

**Table 1.** Projected U.S. average payments per acre per year for alternative programs: 2008-2012.

<b>Payments/Planted Acre</b>	<b>Cotton</b>	<b>Corn</b>	<b>Soybeans</b>	<b>Wheat</b>
<i>Current Program</i>				
LDP <sup>a</sup>	\$8.17	\$1.15	\$3.12	\$0.05
PCCP <sup>b</sup>	\$32.65	\$1.94	\$1.33	\$0.35
Direct Payment	\$32.30	\$22.51	\$11.21	\$15.96
MPCI <sup>c</sup>	\$16.92	\$12.04	\$8.33	\$10.38
Total for current programs	<b>\$90.04</b>	<b>\$37.65</b>	<b>\$23.98</b>	<b>\$26.75</b>
<i>USDA Proposal</i>				
Modified LDP	\$2.65	\$1.10	\$2.78	\$0.03
National RCCP <sup>d</sup>	\$44.19	\$1.12	\$1.45	\$0.36
Modified Direct	\$53.67	\$22.50	\$11.97	\$15.96
MPCI	\$16.92	\$12.04	\$8.33	\$10.38
GRP <sup>e</sup> Layer	\$2.00	\$1.61	\$3.46	\$4.29
Total for USDA Proposal	<b>\$119.43</b>	<b>\$38.37</b>	<b>\$27.99</b>	<b>\$31.01</b>
Market Revenue	\$385.75	\$470.91	\$298.56	\$252.31
Yield	647.59	124.28	39.37	41.12
Beginning Price	\$0.59	\$3.86	\$7.20	\$6.85

<sup>a</sup> Loan Deficiency Payment<sup>b</sup> Price-based Countercyclical payment<sup>c</sup> Multi-peril Crop Insurance (yield insurance)<sup>d</sup> Revenue-based Countercyclical payment<sup>e</sup> Group Revenue Protection (area revenue insurance)**Budget Implications**

Table 2 depicts the budget implications for the alternative commodity program designs. Using the 2007 Congressional Budget Office (CBO) estimated planted acres, we compute the per acre program costs relative to the costs of the current program. The first row in table 2 reports the difference between per acre program payments under the USDA proposal and current programs. Relative to current farm policy, the USDA proposal results in a very small increase in per acre payments for corn, modest increases in per acre program payments for soybeans and wheat, and a more significant increase for cotton. Note that for cotton, the bulk of the increase is explained by the higher direct payment rate. For corn and wheat, the USDA proposal would cost less than the current programs if the GRP component were excluded. For soybeans, the exclusion of GRP would make the cost of the proposal less than a \$1 per acre higher than current programs. The second row in the table reports CBO estimates of planted acres for 2007, and the third row depicts the resulting aggregate difference in total program expenditures between USDA's proposal and current programs. The three-crop total is approximately \$1 billion per year.

**Table 2.** Summary of relative program payouts and baseline cost estimates based on 2009 projected plantings.

Farm Bill Alternative	Cotton	Corn	Soybeans	Wheat	Total
USDA Proposal - Current Per Acre	\$29.39	\$0.72	\$4.01	\$4.26	
FAPRI <sup>a</sup> Estimated 2009 Acres (mil.)	13.07	90.10	69.30	58.70	
Increase in baseline cost per year for USDA Proposal (mil.)	\$384.13	\$64.87	\$277.89	\$250.06	\$976.95

<sup>a</sup> Food and Agricultural Policy Research Institute.

### **Regional Differences**

Tables 1 and 2 report national averages and total program payouts for the USDA proposal and for current commodity programs. However, our model permits an investigation of outcomes on a county-by-county basis. We report county-level results in a series of maps showing the difference between current and proposed average payouts for various programs by county. These maps differentiate between counties where current and proposed payments would be roughly equal and those where payments would be higher under the USDA proposal over the life of a 5-year farm bill. In these figures, current and proposed payments are mapped as being equal if the payment under the USDA proposal is within \$5 per acre of the current payment.

The aggregate numbers reported in tables 1 and 2 suggest that per acre payments are larger under the USDA proposal than under the current program. The county-level maps reflect the generally larger payments and provide insight into the geographic distribution of the payments.

For corn, figure 1 indicates an increase in corn payments per acre mostly in southern and western portions of the Corn Belt (specifically, southern counties in Iowa, central and southern counties in Illinois, and large portions of Missouri and Kansas). Some increase is also noted in the Mid-Atlantic States as well as the Coastal Bend region of Texas. Per acre payments for cotton (figure 2) are shown to increase in virtually every production region, with the exception of counties in Alabama. For soybeans (figure 3), the increase in per acre payments appears to be in counties is greatest in counties on the northern and southern edges of the central Corn Belt. For wheat (figure 4), increases in payments appear to be mostly in the Northern tier of states and in Kansas – principally in eastern parts of the state.

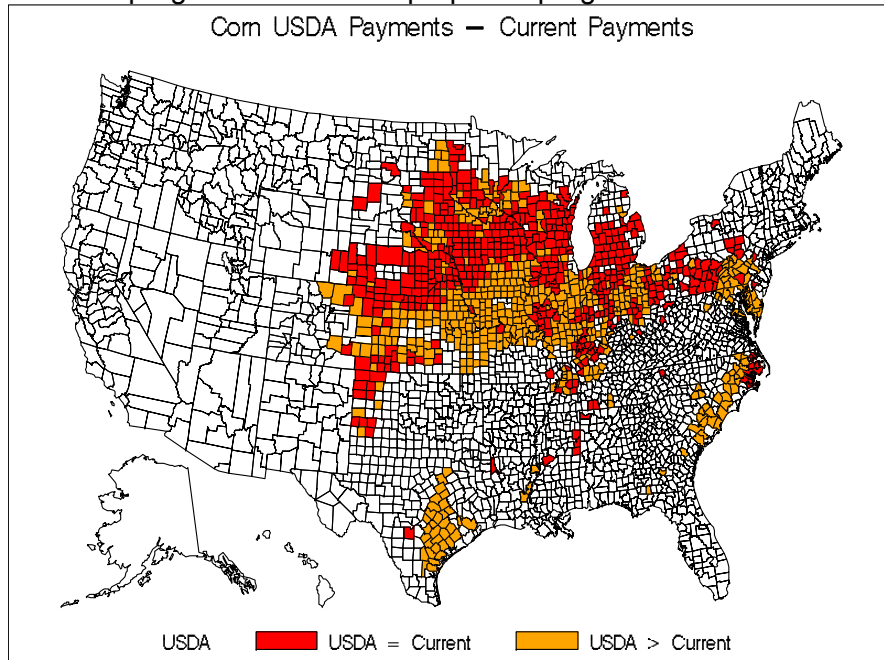
### **Conclusions**

USDA's farm bill proposal has attracted considerable attention from the media, from farm groups, and from members of Congress currently involved in the task of crafting the 2007 farm bill. The proposal includes a number of significant changes to commodity programs. Notable changes include a shift to a revenue trigger for counter-cyclical payments.

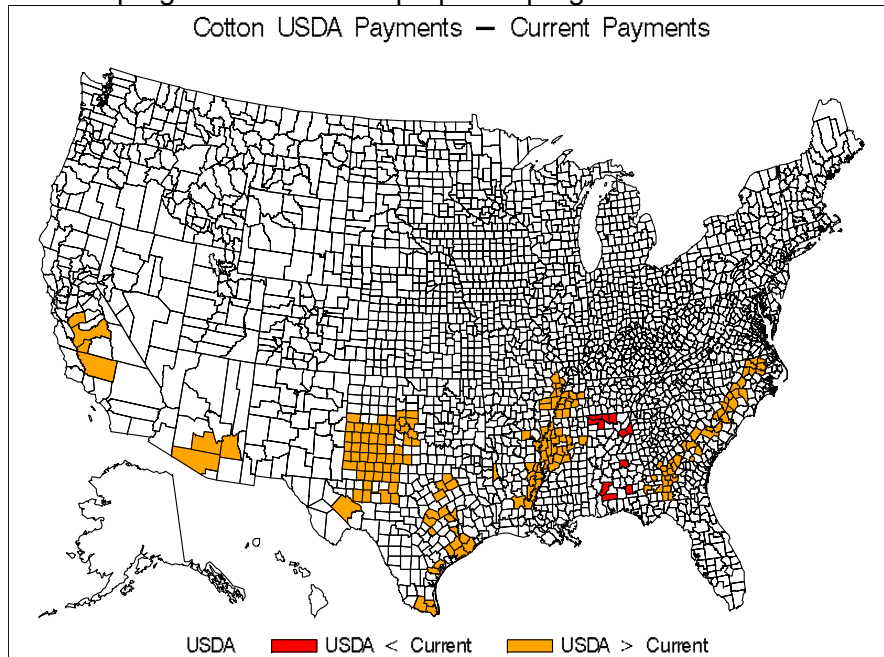
Analysis of USDA's farm bill proposal indicates the proposed commodity program changes would lead to marginal increases in national average per acre payments for corn and soybeans and a more significant increase in per acre payments for cotton. From a budgetary standpoint, the USDA proposal could increase annual expenditures on commodity programs and insurance subsidies by about \$1 billion.

County-level evaluation of per acre payment results suggests the geographic impact of USDA's proposal can vary from crop to crop. In general, for corn and soybeans, the proposed program changes appear to have the effect of shifting payments to the west and south. For cotton, increases are distributed fairly uniformly. For wheat, the most notable per acre payment increases occur in counties in the extreme Northern Plains and in Kansas.

**Figure 1.** Difference in combined payments per acre between current programs and USDA proposed programs for corn.

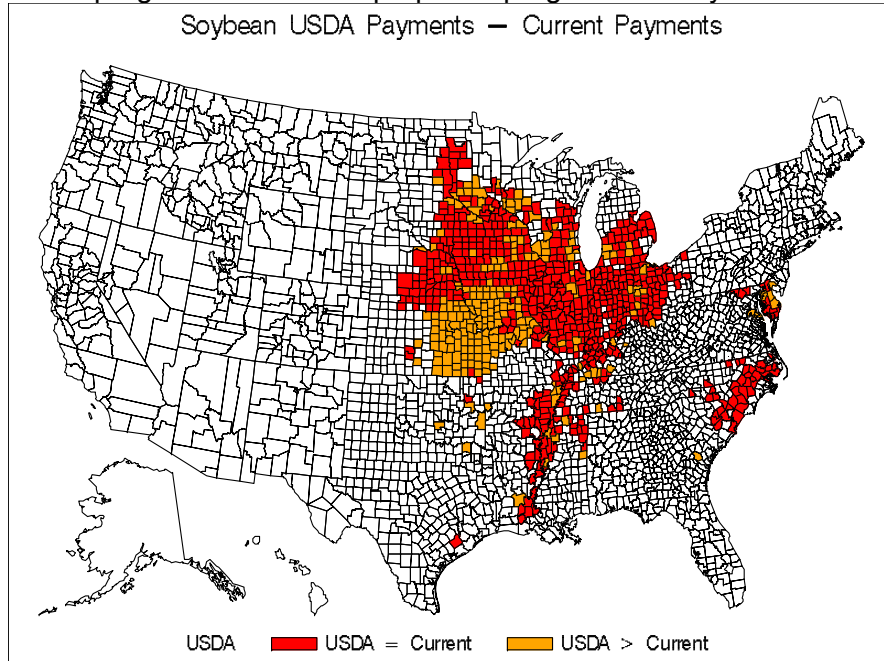


**Figure 2.** Difference in combined payments per acre between current programs and USDA proposed programs for cotton.

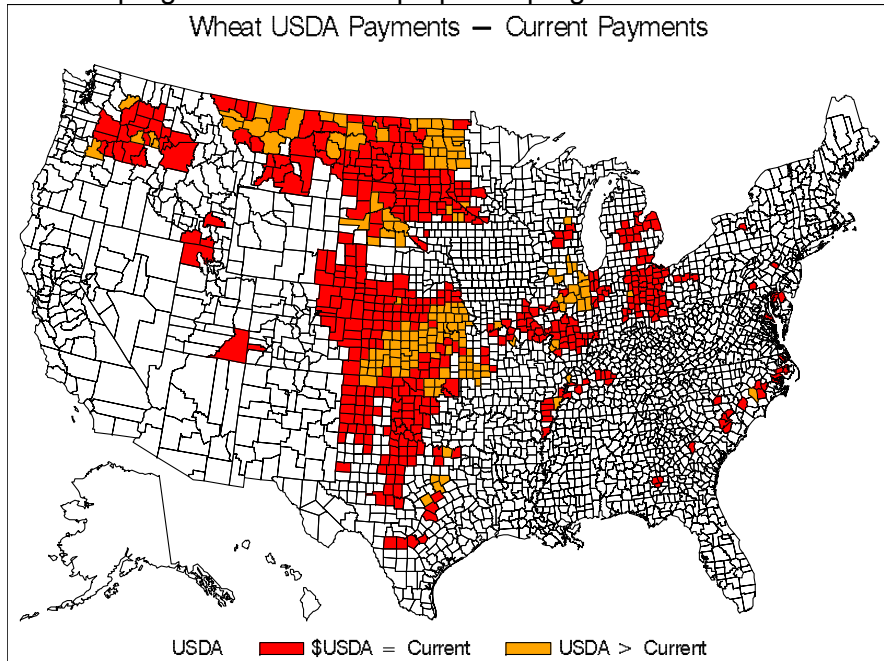




**Figure 3.** Difference in combined payments per acre between current programs and USDA proposed programs for soybeans.



**Figure 4.** Difference in combined payments per acre between current programs and USDA proposed programs for wheat.



## **References**

Babcock, B.A. and C.A. Hart. 2005 (November). How Much Safety Is Available under the U.S. Proposal to the WTO? Center for Agricultural and Rural Development Briefing Paper 05-BP 48, November 2005.

Coble, K.H. and R. Dismukes. 2007. Policy Implications of Crop Yield and Revenue Variability at Differing Levels of Disaggregation. Portland, OR: Selected Paper Presented at the Annual Meeting of the American Agricultural Economics Association.

Coble, K.H., M. Zuniga, and R. Heifner. 2003. Evaluation of the Interaction of Risk Management Tools for Cotton and Soybeans. *Agricultural Systems* 75: 323-340.

Coble, K.H. and J.C. Miller. 2006 (March). The Devil's in the Details: Why a Revenue-based Farm Program is No Panacea. Mississippi State University Department of Agricultural Economics Staff Report 2006-01.

Miller, J.C., B.J. Barnett, and K.H. Coble. 2003. Analyzing Producer Preferences for Counter-Cyclical Government Payments. *Journal of Agricultural and Applied Economics* 35(December): 671-684.

U.S. Department of Agriculture. 2007. *2007 Farm Bill Proposals*. Washington, DC., [Online.] Available from <http://www.usda.gov/documents/07finalfbp.pdf>. Accessed May 17, 2007.