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**ANALYSIS OF THE IMPACTS  
RESULTING FROM THE  
2002 FARM BILL ON INDIANA FRUIT  
AND VEGETABLE GROWERS**

by  
Kyle Althoff and Allan Gray

Staff Paper # 04-05

June 2004

**Dept. of Agricultural Economics  
Purdue University**

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# **ANALYSIS OF THE IMPACTS RESULTING FROM THE 2002 FARM BILL ON INDIANA FRUIT AND VEGETABLE GROWERS**

by

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## **Abstract**

The 2002 Farm Bill has negatively impacted the finances of new/expanding fruit and vegetable (FAV) growers interested in diversifying their operations. Producers wishing to grow FAV on farms that do not have a historical record of such production must either remove their farm from government program payments or face penalties for planting FAV on subsidized acres. If a grower removes a farm from the program, he/she will lose the government payments for the entire farm, not just the acres that are planted to FAV production. Combined with penalties for producing on any land without historical production in FAV, the addition of soybeans as a base eligible crop has unintentionally removed thousands of Midwestern acres previously available for FAV production. The results of the analysis indicate that the current farm policy restricts the income for new/expanding FAV growers. The 2002 Farm Bill scenario reveals that a new/expanding FAV grower with the same farm which now includes soybean base acres would receive \$20.13 per planted acre less than they would have under the 1996 Farm Bill.

Keywords: 2002 Farm Bill, Finances of new/expanding fruit and vegetable growers (FAV), Revenue, Costs of Production, Discounted Cash Flow (DCF) Analysis

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**Analysis of the Impacts Resulting from the 2002 Farm Bill on Indiana  
Fruit and Vegetable Growers**

Abstract.....i  
Executive Summary ..... ii  
Introduction..... 1  
Objective of Study ..... 3  
Importance of FAV’s to Indiana..... 3  
Methodology ..... 5  
Financial Analysis..... 7  
    Revenues ..... 7  
    Government Payments ..... 7  
    Costs of Production..... 7  
    Results – Financial Analysis..... 8  
    Implications..... 11  
Discounted Cash Flow (DCF) Analysis..... 12  
    Results – Discounted Cash Flow (DCF) Analysis ..... 13  
Final Comments ..... 15  
Appendix A: Financial Analysis ..... 17

**ANALYSIS OF THE IMPACTS  
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**Executive Summary**

The 2002 Farm Bill has negatively impacted the finances of new/expanding fruit and vegetable (FAV) growers interested in diversifying their operations. Producers wishing to grow FAV on farms that do not have a historical record of such production must either remove their farm from government program payments or face penalties for planting FAV on subsidized acres. If a grower removes a farm from the program, he/she will lose the government payments for the entire farm, not just the acres that are planted to FAV production. Combined with penalties for producing on any land without historical production in FAV, the addition of soybeans as a base eligible crop has unintentionally removed thousands of Midwestern acres previously available for FAV production.

- The results of the analysis indicate that the current farm policy restricts the income for new/expanding FAV growers. The 2002 Farm Bill scenario reveals that a new/expanding FAV grower with the same farm which now includes soybean base acres would receive \$20.13 per planted acre less than they would have under the 1996 Farm Bill.
- These financial effects translate into yearly income adjustments and, more importantly, can have adverse impacts on long term land valuations once the risk of eroding government subsidized base acreage is considered. Land availability and rental rates become a major component in the financial and strategic analysis of the current FAV farm policies
- As timeframe expectations for the payments are extended, the financial valuation and resulting disparities in income for new/expanding growers is amplified. A Discounted Cash Flow (DCF) analysis reveals that the 2002 Farm Bill becomes increasingly disadvantageous over longer time periods for new/expanding growers relative to the 1996 Farm Bill.
- When considering whether to rent to FAV growers, landowners may be struggling with how the anticipated changes for Direct & Counter-Cyclical Payments, as well as updating of base acres in future farm bills could impact the value of their land.
- The enactment of the FFA amendment would resolve the disadvantage facing Midwestern FAV growers while allowing the producers/landowners to retain base acres for future government programs. The FFA amendment has the potential to alleviate risk associated with eroding government subsidized base acreage and will place new/expanding Midwestern FAV growers on a similar financial standing as

they were prior to the 2002 Farm Bill. The analysis of the proposed FFA Amendment indicates that the DCF of government payments would be comparable to the 1996 Farm Bill levels.

## **Introduction**

The 2002 Farm Bill (Farm Security and Rural Investment Act of 2002) expanded upon the “Freedom to Farm” principles that were established by its 1996 predecessor. The 2002 legislation increased the levels of subsidies, including the Direct and Counter-Cyclical Payments (DCP) and Loan Deficiency Payments (LDP), available to farmers and landowners. Another major adjustment in the Farm Bill was the addition of soybeans to the list of crops to be considered for base acreage. The move opened the door for soybean growers to receive DCP which would provide additional revenue streams especially during low market prices.

Crops with base acreage receive direct payments calculated from the government at specified rates multiplied by the amount of enrolled acres and related historical yields. Even though growers may receive payments for base acreage for a certain crop, they are not obligated to plant that particular crop on the respective enrolled acres. In addition, Counter-Cyclical Program (CCP) payments are paid to growers based on the predetermined target price for the crop. If the crop’s target price less the direct payment rate exceeds the higher of the national loan rate or the 12-month national marketing year average price, the grower receives a CCP payment for the difference between the higher of the two measures and the target price. Again, the producer receives the CCP payment on base acres for the crop and is not obligated to plant the particular crop on the enrolled acres to receive the payment. The purpose of the CCP is to provide farmers with price protection when markets are depressed.<sup>1</sup> There are, however, several restrictions on the types of crops including fruits and vegetables (FAV) which can be planted on acres receiving these government payments.

Producers wishing to receive the DCP must adhere to specific requirements which include planting flexibility rules (Table 1).<sup>2</sup> Although most commodity crops are allowed to be planted on base acreage, the 2002 Farm Bill limits the planting of fruits, vegetables, wild rice, trees, and other perennials unless the farm has a history of producing such crops. Under this provision FAV crops may be planted on base acreage that has a historical record of the specific crop(s) and the DCP will be reduced on an acre-per-acre adjustment if the planting exceeds the non-base acreage of the land<sup>3</sup>. This exclusion has allowed farmers that were producing FAV to continue production on those lands. However, these producers now have a recognized income stream loss from the DCP, relative to producer that did not plant FAVs, due to the producer’s choice to plant FAVs on the land in prior years.

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<sup>1</sup> Gray, Allan. "The 2002 Farm Bill: Impacts on Decisions at the Farm." Purdue University Cooperative Extension Service Publication. CES#-342. May, 2002. Accessed Mar 4, 2004.

<sup>2</sup> Farm Security and Rural Investment Act of 2002. Public Law 107-17. 107<sup>th</sup> Congress. United States Department of Agriculture. Accessed Feb 1, 2004. <http://agriculture.house.gov/fbconfxtxt.pdf>

<sup>3</sup> A producer may be eligible to use “personal history” to plant a specific FAV crop on land that does not have a FAV production history. However, interviews with a current FAV producer revealed that personal history is very restrictive because it can only be used for the specific crop and not for any FAV and personal history cannot be transferred to family members or others.

**Table 1: FAV Planting Provisions Summary Table<sup>4</sup>**

| Is the farm enrolled in DCP? | Is the county approved for double-cropping FAVs? | Does the farm or producer have a FAV history? | Where are FAVs planted? | Is there an acre-for-acre payment reduction? | Is there an additional payment reduction equal to the market value of the FAV in lieu of contract termination? |
|------------------------------|--|---|-------------------------|--|--|
| No                           | Not applicable                                   | Not applicable                                | Anywhere                | No   | No   |
| Yes                          | Yes/No   | Yes/No  | Non-base acres only     | No   | No   |
| Yes                          | No   | Yes   | Base acres              | Yes  | No   |
| Yes                          | No   | No  | Base acres              | Yes  | Yes  |
| Yes                          | Yes  | Yes/No  | Base acres              | No*  | No   |

\* The FAV must be double-cropped with a DCP eligible commodity.

The 2002 Farm Bill significantly restricts the ability of new and/or expanding growers to enter into fruit and vegetable production. Producers wishing to grow FAV on farms that do not have a historical record of such production must either remove the entire farm from government program payments for the year or face penalties for planting FAV on subsidized acres. If a grower removes a farm from the program, he/she will lose the government payments for the entire farm, not just the acres that are planted to FAV production. The fact that many smaller individual farms have been combined into larger farm “numbers” for government payment purposes has compounded the financial implications from this restriction. New and expanding FAV producers end up withdrawing a larger number of acres from the government program if they plant FAVs in order to avoid costly penalties. Furthermore, tenant farmers wishing to plant FAV will likely face resistance from landowners who are compelled to maintain their current levels of corn and soybean base acreage to benefit from the government payments in the short term and preserve the base for potential changes in the next farm bill<sup>5</sup>.

While FAV planting restrictions were in place before the 2002 Farm Bill, the introduction of soybeans as a crop available to receive base acreage increases the impact of FAV planting restrictions for planting FAV acres in the Midwest<sup>6</sup>. In 2001, there were 75.7 million acres of corn planted within the U.S. In the same year, 74.1 million acres of soybeans were planted.<sup>7</sup> While not all 74.1 million acres were added as soybean base, the comparison reveals that the new farm bill increased the amount of land eligible for

<sup>4</sup> Farm Service Agency – United States Department of Agriculture. Direct and Counter-cyclical Payment Program – Wild Rice, Fruit, and Vegetable Provisions. Feb 2003. Accessed Feb 1, 2004. [www.fsa.usda.gov/pas/publications/facts/html/fav03.htm](http://www.fsa.usda.gov/pas/publications/facts/html/fav03.htm)

<sup>5</sup> During an interview with a land manager in Indiana, he indicated that “the uncertainty surrounding any future farm bills combined with the potential loss of base has lead me to advise all of my landowners not to rent their acreage for FAV production.”

<sup>6</sup> The FAV producer interviewed for this study said “The combination of soybean base acres and the FAV provisions in the 2002 Farm Bill have significantly challenged my farm’s ability to expand FAV acres due to land availability, rental prices, and the potential impact on base acres for government payments.”

<sup>7</sup> National Agricultural Statistics Service. Accessed Feb 13, 2004. [www.nass.usda.gov](http://www.nass.usda.gov)



government payments. However, if growers adhered to new regulations, it also removed a considerable amount of “fee” acres that previously had been available for FAV production without penalty.

In Midwestern states such as Indiana where corn and soybeans are the two dominant crops 72.7 percent of the total agricultural production acreage in the state is devoted to corn and soybeans (upwards 91.9 percent of primary crop production). Indiana’s production of 18 major crops amounted to 12.3 million acres of production in 2002.<sup>8</sup> Prior to the 2002 Farm bill when soybeans were not a program crop, there were 7.0 million acres enrolled in government programs. In 2002 however, there were 11.4 million acres enrolled in government programs within the state. The additional 4.4 million acres within Indiana shifted the percentage of primary cropland enrolled in government programs from 57% to 93%. Unless the added program acres had a history of producing FAVs, the 2002 Farm bill restricts the production of FAV on government program acres. It is also crucial to consider that not all of that land would be suitable for FAV production, located within a feasible distance to processors, and/or available for rent. Without even accounting for the quality of land, the current farm policy leaves less than 7 percent of primary cropland available for FAV production there is historical production for the FAV crop.<sup>9</sup>

A major component for valuing the effects of the 2002 Farm Bill is centered on the realized income and long-term potential financial implications facing FAV producers. While there is no certainty on what policies the next Farm Bill will hold, this analysis will attempt to calculate the discounted value of the expected net revenues and government payments broken down into current and long term time frames. The quantitative results will provide an indication of the possible hurdles facing new growth in Midwestern FAV production. Challenged by economic barriers to entry, new and expanding FAV producers will likely be forced to pay higher rents due to the landowners’ potential opportunity costs of foregone direct and counter-cyclical payments. This will likely put a squeeze on expanding FAV production as well as related industries in the Midwest.

### **Objective of Study**

The objective of this study is to examine the consequences, for a representative 100 acre farm in Indiana, from the 2002 Farm Bill planting flexibility provisions as it relates to processed tomato growers. While the scope of the study only covers processing tomatoes, implications from the analysis can be expanded to other FAV crops.

### **Importance of FAV’s to Indiana**

Although Indiana agricultural production is predominantly centered on corn and soybean production, a remarkable variety of fruits and vegetables are also grown within

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<sup>8</sup> National Agricultural Statistics Service. Indiana Agricultural Statistics 2002-2003. Accessed Feb 4, 2004. [www.nass.usda.gov/in](http://www.nass.usda.gov/in)

<sup>9</sup> Farm Service Agency – United States Department of Agriculture. 2002 Direct and Counter-Cyclical Program Final Enrollment Report (DCP-01). Accessed Feb, 12, 2004. [www.fsa.usda.gov/pas/farmbill/2002\\_2003\\_enroll.htm](http://www.fsa.usda.gov/pas/farmbill/2002_2003_enroll.htm)

this Midwestern state. In 2002 Indiana ranked in the top ten of all states in the US for its total production of six different fruit and vegetable crops including processed tomatoes (2<sup>nd</sup>), cantaloupe (5<sup>th</sup>) and watermelon (6<sup>th</sup>). The cumulative value of cash receipts for vegetable production amounted to about \$125.9 million while fruit and nut production was \$24.7 million. Over 80 percent of Indiana's 15.4 million acres of farmland is dominated by the six primary crops (corn, soybeans, wheat, hay, oats and popcorn). Comparatively, while vegetable production consumes less than 0.5 percent of the state's land, it provides upwards of 2 percent of the total cash receipts for Indiana farms.<sup>10</sup> The level of revenues per acre is balanced by the higher levels of inputs and risk associated with FAV production. It is important to note that while Indiana agriculture is dominated by a few major crops, some of the secondary crops in the FAV industry provide a significant and diversified source of income for the state's farmers.

In comparison to fresh-market tomatoes, processed tomatoes are unique in their breeds, harvesting methods, market structure, prices, and production costs.<sup>11</sup> In 2003, there were 309,830 acres of processed tomatoes planted within the U.S. Of that acreage, 93.3 percent of it was located in California, and the second highest level was in Indiana (2.7 percent) with 8,400 acres. The remaining 12,430 acres were spread across Ohio (2.1 percent), Michigan (1.0 percent), and other states (0.9 percent).<sup>12</sup> Bred for their higher levels of soluble solids, processed tomatoes are used in two distinct markets – whole peel and paste products. With higher quality standards and prices which reflect their additional value, whole peel products such as diced tomatoes are created from upwards of “80 percent of the tomatoes raised in Indiana.”<sup>13</sup> Processed tomato growers typically contract production through processors and harvest their crops by machine.<sup>14</sup> While tomatoes are not included in the Federal price and income support programs, growers are eligible to receive “Federal production assistance programs such as Federal crop insurance, disaster assistance, and western irrigation subsidies.”<sup>15</sup>

Although the majority of processed tomatoes are grown in California, several states in the Midwest have growers, processors, and local economies centered on the crop. The direct revenues to growers of processed tomatoes in Indiana, Michigan, and Ohio were estimated to be \$45.4 million in 2002.<sup>16</sup> Furthermore, the ripple effect from purchasing production inputs as well as the additional value added by processing plants

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<sup>10</sup> National Agricultural Statistics Service. Indiana Agricultural Statistics 2002-2003. Accessed Feb 4, 2004. [www.nass.usda.gov/in](http://www.nass.usda.gov/in)

<sup>11</sup> Economic Research Service – United States Department of Agriculture. Tomatoes: Background. Accessed Feb 6, 2004. [www.ers.usda.gov/briefing/tomatoes/background.htm](http://www.ers.usda.gov/briefing/tomatoes/background.htm)

<sup>12</sup> National Agricultural Statistics Service. Vegetable Highlights. 30 Jan 2004. Accessed Mar 4, 2004. [www.nass.usda.gov/ca/rev/veggies/401vegth.htm](http://www.nass.usda.gov/ca/rev/veggies/401vegth.htm)

<sup>13</sup> Janssen, C., et al. Pest Control in Tomatoes for Processing. PPP-101. Purdue Pesticide Programs. Purdue University, West Lafayette, IN. 1999. Accessed Feb 8, 2004. [www.btny.purdue.edu/Pubs/PPP/PPP-101.pdf](http://www.btny.purdue.edu/Pubs/PPP/PPP-101.pdf)

<sup>14</sup> Economic Research Service – United States Department of Agriculture. Tomatoes: Background. Accessed Feb 6, 2004. [www.ers.usda.gov/briefing/tomatoes/background.htm](http://www.ers.usda.gov/briefing/tomatoes/background.htm)

<sup>15</sup> Economic Research Service – United States Department of Agriculture. Tomatoes: Background. Accessed Feb 6, 2004. [www.ers.usda.gov/briefing/tomatoes/background.htm](http://www.ers.usda.gov/briefing/tomatoes/background.htm)

<sup>16</sup> Economic Research Service – United States Department of Agriculture. U.S. Tomato Statistics (92010). Accessed Feb 9, 2004. <http://usda.mannlib.cornell.edu/data-sets/specialty/92010/>

provides a stimulus to the communities and markets that are involved in the processed tomato industry. However, the limitations within the recent Farm Bill regulating the entry and expansion of FAV acreage could become a critical factor in the success and survival for the stakeholders in Midwest processed tomato markets.

### **Methodology**

To illustrate the financial impacts to Indiana Fruit and Vegetable growers from the 2002 Farm Bill, a financial model will be created to calculate the value of different production scenarios and prospective legislative options that FAV growers may face. The model relies upon production cost estimates for corn, soybeans, and tomatoes, along with expectations for revenues and government payments to create projected net revenues under different scenarios. The Discounted Cash Flow (DCF) values of each scenario are then analyzed over four time frames based on potential valuation periods that growers and landowners may be considering.

The focus of this analysis is to compare how the regulations for base acres under the three scenarios would impact the incomes of FAV producers and landowners. To isolate the impact of the farm policy change, the crop mix actually planted on the 100 acre farm is assumed to be constant across all scenarios with 50 acres of corn, 25 acres of soybeans and 25 acres of tomatoes. This crop rotation reflects a classic 4 year rotation for the tomato crop. The amount of enrolled base acres for corn and soybeans is changed based on the policy scenarios to provide a comparison of the previous, current, and proposed farm policies. To maintain comparability of policy changes, the farm is assumed to have no FAV history. The three scenarios include (See Table 2 and Figure 1):

1. 1996 Farm Bill assumes that only the 50 corn base acres receive DCP payments and that the remaining 50 acres are available for planting any crop without penalty.
2. 2002 Farm Bill Regulations for New/Expanding Growers assumes penalties and adjustments are made when FAV production occurs on base acres without production history and that soybean base has been added to the farm. The farm has 50 corn base acres and 50 soybean base acres, reflecting the opportunity to update base acres that available with the enactment of the 2002 Farm Bill. This scenario reflects the impacts of bringing new FAV ground into production.
3. Farming Flexibility Act of 2004 (FFA Amendment)<sup>17,18</sup> is a proposed policy under consideration which would remove the penalty for FAV production on base acres but maintain the acre-per-acre adjustments that currently apply. New FAV ground would then be eligible to receive payments on the base acres not planted

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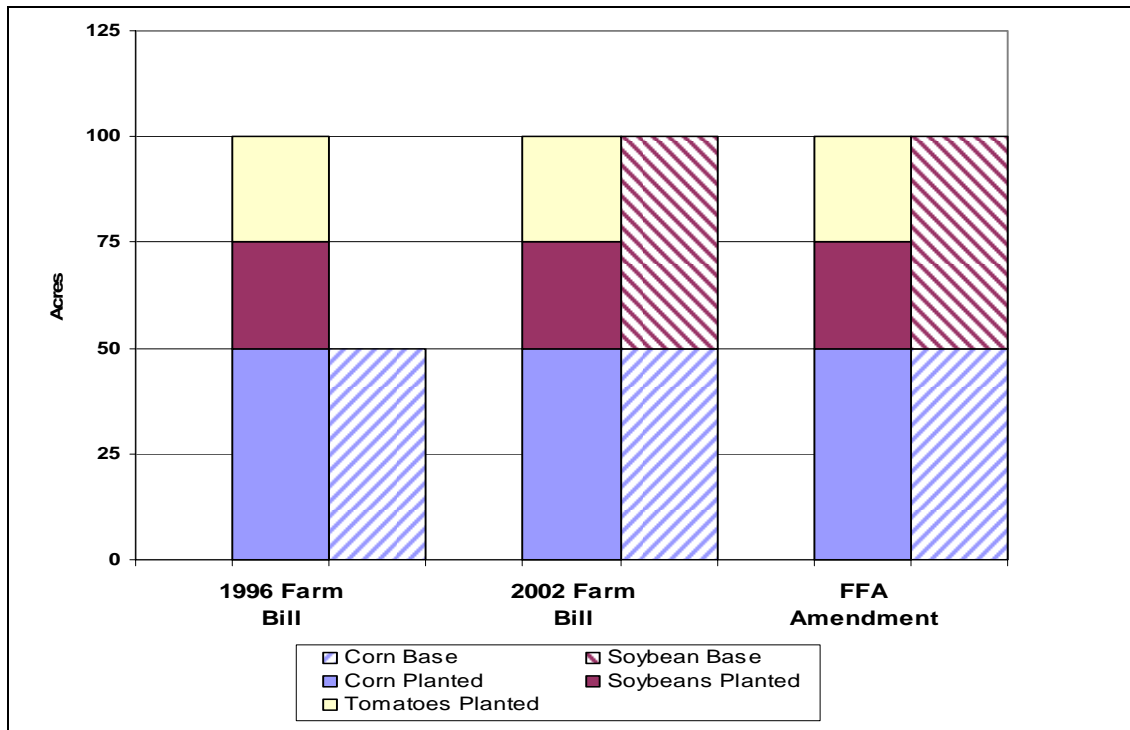
<sup>17</sup> Public Bills and Resolutions – US Senate. Farming Flexibility Act of 2004 – S. 2141.” US Congressional Record. 26 Feb 2004. Accessed Mar 26, 2004. <http://thomas.loc.gov/>

<sup>18</sup> Similar legislation has been introduced within the US House of Representatives: Public Bills and Resolutions – US House of Representatives. Farming Flexibility Act of 2003 - H.R. 2181 IH.” US Congressional Record. 21 May 2003. Accessed Mar 26, 2004. <http://thomas.loc.gov/>

to FAV, but would not receive any government program payments for base acres planted with FAV. The farm is still assumed to have 50 corn base acres and 50 soybean base acres to maintain comparability.

**Table 2: Crop Production Scenarios - Planting and Base Acreage**

|                           | 1996<br>Farm Bill | 2002<br>Farm Bill | FFA<br>Amendment |
|---------------------------|-------------------|-------------------|------------------|
| Corn Production Acres     | 50                | 50                | 50               |
| Soybeans Production Acres | 25                | 25                | 25               |
| Tomato Production Acres   | 25                | 25                | 25               |
| Corn Base Acres           | 50                | 50                | 50               |
| Soybean Base Acres        | 0                 | 50                | 50               |



**Figure 1: Crop Production Scenarios - Planting and Base Acreage**

Tipton County, IN was used as a reference point for the production of the crops within the study. The county has been identified as one of the top seven in processed tomato production within Indiana. Tipton County's relative proximity to the geographical reference point of the processed tomato production budgets coupled with its central relationship to other major Indiana processed tomato counties supported its use in

this analysis.<sup>19</sup> The county's 2003 production year yields and applicable loan rates for each crop were included as inputs within the model.

### **Financial Analysis**

To analyze the impacts of the 2002 Farm Bill on FAV producers, a financial model was created to compare specific production scenarios. The detailed spreadsheet designed for the analysis is included in Appendix A.

### **Revenues**

The estimates for prices and government payments take into consideration the previous 11 years of average yearly market prices within Indiana. Using those prices, an average expected price and government program payment for each of the three crops was computed and utilized in projecting the average expected net revenues for the farm. The USDA – NASS estimates for average Indiana yields per acre in 2003 were then incorporated into the model to calculate the expected returns per-acre for the respective crops.

### **Government Payments**

To analyze the potential value of government payments, the current program rates for the 2004 growing season were used to estimate the expected value of government payments (and penalties) for corn, soybeans, and tomato production.<sup>20</sup> The direct payment rate for corn and soybeans in 2004 is \$0.28 and \$0.44 per bushel. For counter-cyclical payments, the current Target Price is set at \$2.63 and \$5.80 per bushel respectively. Using the state historical prices from 1992 – 2002, current loan rates of \$1.95 for corn and \$5.00 for soybeans, along with the National Year Market Average Prices from 1992-2002, the average expected counter-cyclical payment per bushel for corn and soybeans was computed. The projection is intended to represent a “typical” year's price and government payment support – not actual 2004 expected market prices or government payments. The average Indiana Direct Program Yields and Counter-Cyclical Program Yields from 2003 were then incorporated into the calculations to create the average payment per acre for Direct and Counter-Cyclical Payments.<sup>21</sup>

### **Costs of Production**

To analyze the financial tradeoffs related to the Farm Bill FAV restrictions, the per acre costs of production for corn, soybeans and tomatoes were compared. For processed tomatoes, the 1999 Ohio Enterprise Budget is one of the most recent and

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<sup>19</sup> Janssen, C., et al. Pest Control in Tomatoes for Processing. PPP-101. Purdue Pesticide Programs. Purdue University, West Lafayette, IN. 1999. Accessed Feb 8, 2004.  
[www.btny.purdue.edu/Pubs/PPP/PPP-101.pdf](http://www.btny.purdue.edu/Pubs/PPP/PPP-101.pdf)

<sup>20</sup> Gray, Allan. "The 2002 Farm Bill: Impacts on Decisions at the Farm." Purdue University Cooperative Extension Service Publication. CES#-342. May, 2002. Accessed Mar 4, 2004.  
[www.agecon.purdue.edu/staff/gray/Extension/Agricultural%20Policy/extensionpolicy.htm](http://www.agecon.purdue.edu/staff/gray/Extension/Agricultural%20Policy/extensionpolicy.htm)

<sup>21</sup> Farm Service Agency – United States Department of Agriculture. 2003 Direct and Counter-Cyclical Program Final Enrollment Report (DCP-01). Accessed Feb, 12, 2004.  
[www.fsa.usda.gov/pas/farbill/2002\\_2003\\_enroll.htm](http://www.fsa.usda.gov/pas/farbill/2002_2003_enroll.htm)

detailed production cost estimates in the Midwest.<sup>22</sup> Equivalent year corn and soybean budget comparisons were found in the 1999 USDA – ERS costs and returns estimates for the Heartland region.<sup>23</sup> The Heartland region stretches from western Ohio to eastern South Dakota and includes all of the state of Indiana. Indiana state yields from 2003 were utilized to project variable costs. The rental rate of land, taxes, insurance, and general farm overhead were considered to be the same across all crop production costs and were removed as costs of production. The reported net revenue is thus reported as revenue before adjustments for land rental rates, taxes, insurance, and overhead.

### **Results – Financial Analysis**

The results of the analysis indicate that the current farm policy restricts the income for new/expanding FAV growers. The per acre results provide an indication of the relative value of government payments and net revenues across the three policy scenarios.<sup>24</sup> In Table 3 the value of specific government payments is detailed for each scenario followed by the total value of the direct and counter-cyclical payments (DCP) after acre-per-acre adjustments and penalties. The last row depicts how the changes to government payments would affect the producer’s net revenues per acre. The findings indicate that, as a result of the 2002 Farm Bill, new/expanding growers in the Midwest may be facing additional barriers to entry which will restrict future FAV production in the region.

Figure 2 depicts the breakdown for the Direct and Counter-cyclical payments in per acre values expected from FAV production including adjustments and penalties. When comparing these three scenarios, it becomes evident that the current farm policy provides the lowest level of net revenues and DCP for new/expanding FAV growers

Table 3: Per Acre Direct & Counter-cyclical Payments and Net Revenues

|   | <b>1996<br/>Farm Bill</b> | <b>2002<br/>Farm Bill</b> | <b>FFA<br/>Amendment</b> |
|---|---------------------------|---------------------------|--------------------------|
| Government Payments (per acre)                    |                           |                           |                          |
| Direct Payments                                   | \$ 12.96                  | \$ 19.54                  | \$ 19.54                 |
| Counter Cyclical Payment                          | \$ 7.18                   | \$ 9.35                   | \$ 9.35                  |
| Direct & CCP - Acre/Acre Adjustment               | \$ -                      | \$ (4.38)                 | \$ (4.38)                |
| Penalty - No Production History                   | \$ -                      | \$ (24.51)                | \$ -                     |
| <b>Total DCP Less Adjustments &amp; Penalties</b> | <b>\$ 20.13</b>           | <b>\$ -</b>               | <b>\$ 24.51</b>          |
| Net Revenues (per acre)                           |                           |                           |                          |
|   | \$ 295.56                 | \$ 275.43                 | \$ 299.94                |

<sup>22</sup> Ohio State University Extension - Department of Agricultural, Environmental, and Development Economics. Ohio Enterprise Budgets: 1999 Processing Tomato Production Budget. The Ohio State University. Accessed Feb 10, 2004. <http://ohioline.osu.edu/e-budget/99toma.html>

<sup>23</sup> Economic Research Service – United States Department of Agriculture. U.S. and Regional Cost and Return Data. Accessed Feb 10, 2004. [www.ers.usda.gov/Data/CostsAndReturns/testpick.htm](http://www.ers.usda.gov/Data/CostsAndReturns/testpick.htm)

<sup>24</sup> The per acre costs reflect the specific calculated value for this ratio of production. Different ratios of production would affect the results depending upon the scenario and acreage levels.

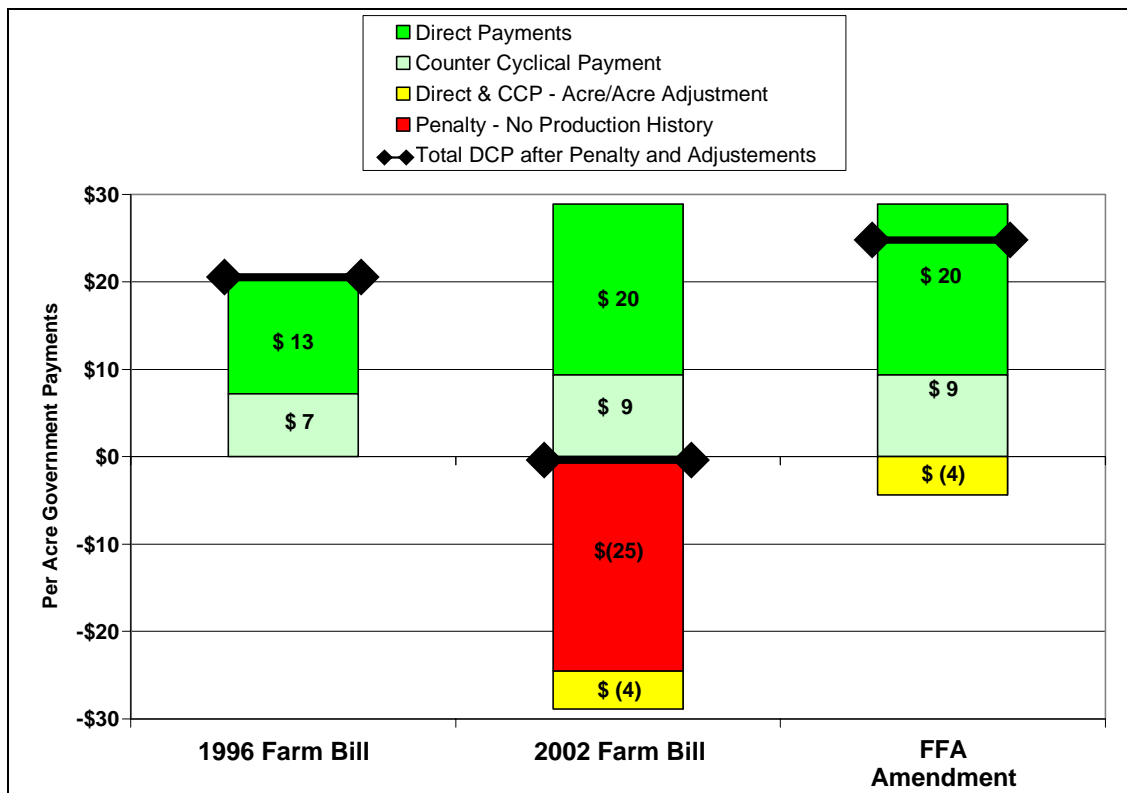


Figure 2: Detailed Per Acre DCP Payments, Adjustments, and Penalties

The comparison of the 1996 Farm Bill to the 2002 Farm Bill reveals the extent of how the existing farm policy penalizes new/expanding growers for harvesting FAVs on base acres that are enrolled in the government program. Previously with the 1996 Farm Bill, a FAV grower would have earned a net revenue before excluded costs of \$295.56 per acre (Table 3). Included within that net revenue would have been \$12.96 in direct payments and \$7.18 in counter-cyclical payments per acre for the corn base on the farm (Figure 2).<sup>25</sup> Because soybeans were not a program crop in the old farm bill, there would have been non-enrolled “free” acres available for FAV production, thus reducing the risk of a penalty for producing FAVs on base acres. With only 50 corn base acres, the new/expanding FAV grower would conceptually have been able to plant up to 50 acres of FAVs on the 100 acre farm without facing a penalty or adjustment.

The 2002 Farm Bill scenario reveals that a new/expanding FAV grower with the same farm which now includes soybean base acres would receive \$275.43 per acre, a decrease of \$20.13 per acre, in net revenues relative to the 1996 Farm Bill scenario. The cash revenues from corn production remain the same and revenues associated with soybean production are expected to increase with the addition of base acres and DCP for that crop. Conversely, planting FAVs forces the grower to take an acre-per-acre adjustment on the base acres planted to FAV as well as a penalty equal to the minimum

<sup>25</sup> Individual Direct and Counter-cyclical payments may not add to exactly equal the total DCP value due rounding effects.

of the remaining value of the DCP or the value of FAV production. As shown in Table 3, the unrealized acre-per-acre adjustment reduces the net revenues for the 25 acres of tomatoes planted by \$4.38 per acre. The remaining potential DCP for the 2002 Farm Bill scenario is then reduced down to zero as the penalty of \$24.51 per acre is applied (minimum of the remaining value of the DCP).<sup>26</sup> The rise in soybean government payments from the 2002 Farm Bill is more than offset by the penalty and adjustment for harvesting 25 acres of FAVs on base acres, resulting in the decrease in net revenues of \$20.13 per acre.

Under the 1996 Farm Bill, the farmer had 50 non-enrolled “free” acres to produce FAVs without a penalty. However, even if only one acre of FAV were planted after the 2002 Farm Bill, the direct and counter-cyclical payments attributed to all 100 acres were eliminated due to the grower’s choices to enroll the 50 acres as soybean base. On the 100 acre example farm utilized for this study, this amounts to a loss for a new/expanding FAV grower of \$2,013 in DCP when compared to operations under the old farm bill.

The proposed FFA Amendment scenario would provide new/expanding processed FAV growers with increased flexibility for diversifying their operations while limiting the financial restrictions from such decisions. Under this scenario new/expanding processed FAV growers would face an acre-per-acre adjustment on their DCP for planting FAV on base acres, but they would not be penalized for the decision as is the case under the current farm bill. As shown in Table 3, a new/expanding FAV producer under this scenario would receive the DCP of \$24.51 per acre corresponding to their planted corn and soybean acres instead of losing it as penalty which is required under the current farm bill.

The producer would still also take an acre-per-acre reduction in DCP of \$4.38 per acre for the value of the government payment ascribed to the 25 base acres planted with FAV.<sup>27</sup> The FAV producer is then receiving a program payment for 75 out of the 100 base acres, which is still \$4.38 per acre less than what the grower would have received if they remained in only corn and soybean production. The net revenues from the proposed FFA Amendment are expected to be \$299.94 per acre for the example farm. However, this is only about \$4 per acre higher than the farm would have earned operating under the 1996 Farm Bill. The increase of \$4 per acre is consistent with the additional government support received under the 2002 Farm Bill for land not planted to FAVs.

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<sup>26</sup> In this analysis, the penalty will always be equal to the remaining value of the DCP until the farm’s total DCP is greater than the value of tomato production (\$2,680 per acre x 25 acres = \$67,000)

<sup>27</sup> The fact that the FFA Amendment has a net revenue \$438 higher than the 1996 Farm Bill scenario and there is acre-per-acre adjustment of -\$438 in the FFA Amendment is not merely coincidental. The DCP acre-per-acre adjustment was made to the lower value program payments which in this analysis were soybean payments. With 50 acres of soybeans added as base since the Pre-’02 Farm Bill scenario, the total value of the soybean payment would have been \$876. With the acre-per-acre adjustment to half of those acres (25 acres) for FAV production, the remaining net revenue is half of the original payment.



## **Implications**

It is crucial to understand that current FAV growers with production history on base acres are operating under similar financial characteristics as provided in the FFA amendment. Current FAV growers do not face penalties for planting on land with a production history of FAV; they only face the acre-per-acre adjustment for planting on base acres. In the short-term, this financial analysis indicates that the FFA Amendment would place new/expanding growers on a similar playing field as current FAV growers while also providing net revenues comparable to the 1996 Farm Bill.

An interesting side note arises when analyzing the potential compliance of growers to report FAV production and realize a penalty on base acres. New/expanding growers are assessed the penalty on base acres using the minimum value of the farm's DCP or the value of the FAV production on base acres. Using the sample farm in this analysis, the farm's ratio of total adjusted DCP compared to tomato acreage would have to exceed the \$2,680 in expected cash receipts per acre of tomato production before the penalty could be applied to the value of FAV production. When the ratio of total adjusted DCP to planted tomato acreage is less than FAV production, a farm facing the DCP penalty would be similar to a farm not enrolled in the government program at all. Because tomatoes are such a high value crop, the DCP is typically substantially lower per acre than the value of actual production. Thus, producers that intend to grow FAV on a farm would normally face the same financial restrictions if they remove their farms from the government programs compared to if they grow FAV and receive the DCP penalty. This also presents a financial enforcement conundrum that has likely enticed some growers to not remove their farms from enrollment in the government program while also attempting to avoid the penalties.

In this analysis, a new/expanding grower increasing FAV production in 2004 would be able to receive \$28.89 per acre more in government program payments by producing corn and soybeans instead of FAVs. While a FAV grower is expected to have higher net revenues from FAV production compared to exclusive corn and soybean production, other factors such as landowner's desire to maintain base and secure current as well as future government program payments may still limit the availability of land for FAV production. By restricting the ability of new/expanding FAV growers, the 2002 Farm Bill may be providing an incentive for traditional corn and soybean farmers to not diversify their operations. Such decisions would actually increase the amount of government support required under current regulations for those program crops.

Landowners that want to protect the government payments may be less willing to rent land for FAV production. Additionally, the process of updating acreage after the 2002 Farm Bill could have many landowners concerned over how current FAV acres could impact their land's future government. Landowners may evaluate the risks to future government payments associated with FAV production and decide to either increase the rental rates or refuse to rent to FAV growers altogether. The next section of the study evaluates the effective long-term value for the stream of direct and counter-cyclical payments (DCP) which were calculated across the three scenarios in the previous

analysis. It also explains how landowner expectations for these payments may impact their rental decisions for new/expanding FAV growers.

### **Discounted Cash Flow (DCF) Analysis**

Land availability and rental rates become a major component in the financial and strategic analysis of the current FAV farm policies. To project the potential impacts on land values from FAV regulations, a Discounted Cash Flow (DCF) Analysis was performed based on four time periods. For each scenario, the DCF analysis calculates the discounted values assuming a constant stream of payments for the government payments computed in the preceding analysis. The following formula was used to estimate the present value for the producer receipts:

$$PV = PMT \left[ \frac{1 - \frac{1}{(1+i)^n}}{i} \right]$$

where *PMT* equals the initial government payment calculated previously, *i* equals the effective interest rate, and *n* equals the timeframe considered. A current estimate for the land capitalization rate within Indiana is 6 percent. This rate was used for the interest rate *i* to discount the expected government payments back to their present values.<sup>28</sup> The flow of payments was assumed to occur at the end of each year over specified time periods, *n*, which included 1, 4, 10, and 20 year time horizons.

The timeframes represent the potential valuation landowners may attribute to the continuation of government program payments. For example, the 1-Year period represents the value of the DCP calculated earlier discounted by the current land capitalization rate for one year. With the next revision of the Farm Bill slated to occur less than four years from now in 2007, the 4-Year DCF analysis represents the expected value of a constant stream of net revenues through the end of the 2002 Farm Bill. Similarly, the 10-Year and 20-Year horizons are associated with landowner expectations for prolonged government support.

The differences between the three scenarios and their corresponding timeframes represent landowners expected valuation for the stream of government payments. Land prices include a valuation for the expected government payment income streams attributed to the acreage. A planting pattern that includes FAV could erode base acres which in turn could decrease future government payments. If a landowner perceives that government payments will be extended further into the future, their valuation of the current government payments and of the base acres that support those payments increases. However, if FAV production were to occur on the land, the resulting loss in government payments and potential effects if base updating is allowed in the future would create a loss to the land valuation. The results indicate that as landowner expectations for the length of continuation in government program payments increases,

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<sup>28</sup> Dobbins, Craig. "RE: Capitalization rate for land." Email to the author. Purdue University. West Lafayette, IN. 26 Feb 2004.

the negative impact of current FAV restrictions on the land value, and accordingly the land rent, increases.

**Results – Discounted Cash Flow (DCF) Analysis**

The results of the DCF analysis (Table 4) depict the change in the discounted long-term financial value of the Direct and Counter-Cyclical payments when comparing the 2002 Farm Bill and FFA amendments to the 1996 Farm Bill Provisions. Since the only difference in the earlier financial analysis between each of the scenarios’ net revenues was the change in government payments, the main focus of the DCF analysis is the valuation attributed to those DCP payments. As timeframe expectations for the payments are extended, the financial valuation and resulting disparities in income for new/expanding growers is amplified. The DCF analysis reveals that, when compared to the alternative scenarios, the 2002 Farm Bill becomes increasingly disadvantageous over longer time periods for new/expanding FAV growers.

Table 4: Comparison of Per Acre DCF for Direct and Counter-cyclical Payments Compared to 1996 Farm Bill as Base Reference

| <b>Scenario</b> | <b>Timeframe</b> | <b>DCP Payments<br/>Net Value/Acre</b> |
|-----------------|------------------|--|
| 1996 Farm Bill  | 1 Year           | -                                      |
|                 | 4 Years          | -                                      |
|                 | 10 Years         | -                                      |
|                 | 20 Years         | -                                      |
| 2002 Farm Bill  | 1 Year           | - \$ 19                                |
|                 | 4 Years          | - \$ 70                                |
|                 | 10 Years         | - \$ 148                               |
|                 | 20 Years         | - \$ 231                               |
| FFA Amendment   | 1 Year           | \$ 4                                   |
|                 | 4 Years          | \$ 15                                  |
|                 | 10 Years         | \$ 32                                  |
|                 | 20 Years         | \$ 50                                  |

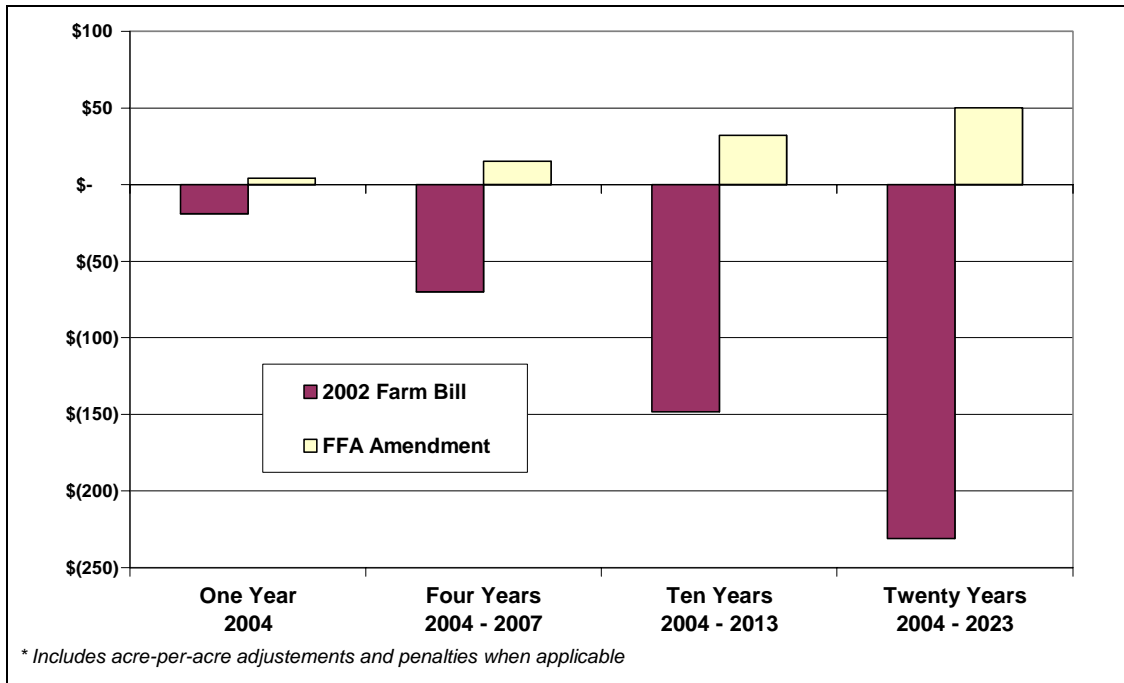


Figure 3: Comparison of Per Acre DCF Value for Direct and Counter-cyclical Payments Compared to 1996 Farm Bill as Base Reference

Under the 1996 Farm Bill, the DCF analysis results indicate that the total present value of DCP amounts to \$19 per acre when discounted from a 1-Year time horizon. As the perceived time horizon increases, the value of the DCP is expected to grow. The present value of those payments increases as the expectation for the government support escalates. In a 20 year time horizon, the value for the DCP using the 1996 Farm Bill regulations for FAV production is determined to be \$231 per acre.

As determined earlier a new/expanding FAV grower is not expected to receive any DCP, presently or into the future, with the 2002 Farm Bill. This leaves the present value of government support for all timeframes at \$0. Discounted over one year and compared to what could have been achieved under the previous farm bill, this translates into the \$19 less per acre for the grower. The disparity between the 1996 farm policy and the 2002 Farm Bill is magnified as the number of years for production on the farm increases. Under the 2002 Farm Bill, the restrictions on DCP transform the financial hardships for new expanding growers over the four year timeframe into a present value loss of \$70 per acre when compared to the 1996 Farm Bill (Table 4, Figure 3).

Land values and rental rates carry an expected valuation for the role of government payments in the associated revenue stream. If a landowner expects that the future government program payments would continue for the next decade instead of only through the next farm bill revision, the difference in the DCF of the DCP for a new/expanding FAV grower transforms from a loss of \$148 per acre over 10 years to a loss of \$231 per acre over 20 years when comparing the current regulations to the 1996

Farm Bill. In other words, if the current FAV regulations and 2002 Farm Bill subsidies are expected to continue for 20 years, a farm under the 2002 Farm Bill is suffering a financial disadvantage in present value of \$231 less per acre compared to a producer during the previous farm policy. The \$231 difference is an estimate of the impact from the current FAV rules on the long-term value of land if 25 percent of the land is in FAV.

Providing similar compensation to the 1996 Farm Bill, the FFA Amendment scenario is expected to reinstate the net revenues previously available to new/expanding FAV growers. With this scenario, the present value of the 1-Year discounted DCP payments is \$23 more per acre than the current regulations, or \$4 more than the 1996 Farm Bill scenario. Even in the short term, the analysis reveals that the adoption of the FFA amendment would result in discounted value for net revenues over 4-Years of \$85 more per acre than available under the current farm bill. Compared to the 1996 Farm Bill, the FFA Amendment would provide \$15 more per acre over 4 years. For a 20 year time horizon, the present value of the FFA Amendment scenario increases to \$281 more per acre when contrasted to current regulations, or \$50 more per acre when compared to the 1996 Farm Bill. Effectively, new/expanding growers could gain \$281 per acre in present value if the regulations for planting FAV on base acres were resolved with the implementation of the FFA Amendment and the provisions of the 2002 Farm Bill remained in place for twenty years.

### **Final Comments**

The financial disincentive of losing DCP coupled with questions surrounding the potential updating of base acres in the next farm bill could prove to keep new/expanding growers from adding FAV production. While the ability to add soybean base under the 2002 Farm Bill initially seemed appealing, the rules surrounding new/expanding FAV production have brought unwelcome consequences. As a result of the 2002 Farm Bill, the regulations for FAV production on base acres have restricted the financial opportunities for FAV growers. After penalties and adjustments, new/expanding FAV growers will lose a considerable amount of income relative to the potential prior to the 2002 Farm Bill. Farmers and landowners may choose to remain out of FAV production due to the expected losses of current government payments and the uncertainty of production decisions' impacts on future base acreage.

When considering whether to rent to FAV growers, landowners may be struggling with how the anticipated changes for DCP and updating of base acres in future farm bills could impact the value of their land. The DCF analysis revealed that as landowner expectations surrounding future potential government payments increases, the income associated with those payments could cause land values to appreciate. For a new/expanding FAV tenant grower, a landowner that has longer time frame expectations for their government payments will expect a higher rent to compensate for the potential loss of this land appreciation. Additionally, the promise of government payments serves as a risk mitigation tool for the landowner. With the current farm bill guaranteeing specific payments through 2007, landowners may be more willing to keep their land out of FAV production at least until the next revision.

The enactment of the FFA amendment would resolve the disadvantage facing Midwestern FAV growers while allowing the producers/landowners to retain base acres for future government programs. The FFA amendment has the potential to alleviate risk associated with eroding government subsidized base acreage and will place new/expanding Midwestern FAV growers on a similar financial standing as they were prior to the 2002 Farm Bill. The analysis of the proposed FFA Amendment indicates that the DCF of government payments and their associated values would be comparable to the payments received on commodity production land for producers not producing FAVs.

## Appendix A: Financial Analysis

| NPV Per-Acre Comparison of Crop Net Returns                | 1996 Farm  | 2002 Farm  | FFA        |
|--|------------|------------|------------|
|  | Bill       | Bill       | Amendment  |
| <b>Planting Decision</b>                                   |            |            |            |
| Corn Planted   | 50         | 50         | 50         |
| Soybeans Planted   | 25         | 25         | 25         |
| Tomatoes Planted   | 25         | 25         | 25         |
| <b>Total Acres</b>   | <b>100</b> | <b>100</b> | <b>100</b> |
| <b>Base Acreage</b>  |            |            |            |
| Corn Base  | 50         | 50         | 50         |
| Soybean Base   | 0          | 50         | 50         |
| <b>Available FAV Acres</b>                                 | <b>50</b>  | <b>0</b>   | <b>0</b>   |
| <b>Production History? (Acre/acre Adjustment Allowed?)</b> | <b>NO</b>  | <b>NO</b>  | <b>YES</b> |

| Farm Production Income Total                        |                   |                  |                  |                  |
|---|-------------------|------------------|------------------|------------------|
| <b>Corn</b>   |                   |                  |                  |                  |
|   | <i>(Per Acre)</i> |                  |                  |                  |
| Corn Cash Revenues                                  | \$ 312.67         | \$ 15,634        | \$ 15,634        | \$ 15,634        |
| Corn Government Payments                            |                   |                  |                  |                  |
| Direct Payments                                     |                   | \$ 1,296         | \$ 1,296         | \$ 1,296         |
| Counter Cyclical Payment                            |                   | \$ 718           | \$ 718           | \$ 718           |
| LDP   |                   | \$ 626           | \$ 626           | \$ 626           |
| Total Government Program Payments                   |                   | \$ 2,639         | \$ 2,639         | \$ 2,639         |
| Less Corn Cost of Production                        | \$ (252.58)       | \$ (12,629)      | \$ (12,629)      | \$ (12,629)      |
| Corn Net Revenues                                   |                   | \$ 5,644         | \$ 5,644         | \$ 5,644         |
| <b>Soybeans</b>                                     |                   |                  |                  |                  |
| Soybean Cash Revenues                               | \$ 300.17         | \$ 7,504         | \$ 7,504         | \$ 7,504         |
| Soybean Government Payments                         |                   |                  |                  |                  |
| Direct Payments                                     |                   | \$ -             | \$ 658           | \$ 658           |
| Counter Cyclical Payment                            |                   | \$ -             | \$ 218           | \$ 218           |
| LDP   |                   | \$ 492           | \$ 492           | \$ 492           |
| Total Government Program Payments                   |                   | \$ 492           | \$ 1,368         | \$ 1,368         |
| Less Soybean Cost of Production                     | \$ (145.52)       | \$ (3,638)       | \$ (3,638)       | \$ (3,638)       |
| Soybean Net Revenues                                |                   | \$ 4,359         | \$ 5,234         | \$ 5,234         |
| <b>Tomatoes</b>                                     |                   |                  |                  |                  |
| Tomato Cash Revenues                                | \$ 2,679.59       | \$ 66,990        | \$ 66,990        | \$ 66,990        |
| Government Payments Adjustments                     |                   |                  |                  |                  |
| Direct & CCP - Acre/Acre Adjustment                 |                   | \$ -             | \$ (438)         | \$ (438)         |
| Penalty - No Production History (from Expected DCP) |                   | \$ -             | \$ (2,451)       | \$ -             |
| Total Government Program Payments Adjustments       |                   | \$ -             | \$ (2,889)       | \$ (438)         |
| Less Tomato Cost of Production                      | \$ (1,897.43)     | \$ (47,436)      | \$ (47,436)      | \$ (47,436)      |
| Tomato Net Revenues                                 |                   | \$ 19,554        | \$ 16,665        | \$ 19,116        |
| <b>Total Crops</b>                                  |                   |                  |                  |                  |
| Total Crop Cash Revenues                            |                   | \$ 90,127.55     | \$ 90,127.55     | \$ 90,127.55     |
| Total Crop Government Payments                      |                   |                  |                  |                  |
| Direct Payments                                     |                   | \$ 1,296         | \$ 1,954         | \$ 1,954         |
| Counter Cyclical Payment                            |                   | \$ 718           | \$ 935           | \$ 935           |
| LDP   |                   | \$ 1,118         | \$ 1,118         | \$ 1,118         |
| Direct & CCP - Acre/Acre Adjustment                 |                   | \$ -             | \$ (438)         | \$ (438)         |
| Penalty - No Production History                     |                   | \$ -             | \$ (2,451)       | \$ -             |
| Total Government Program Payments                   |                   | \$ 3,131         | \$ 1,118         | \$ 3,569         |
| Less Total Crop Cost of Production                  |                   | \$ (63,703)      | \$ (63,703)      | \$ (63,703)      |
| <b>Total Crop Net Revenues</b>                      |                   | <b>\$ 29,556</b> | <b>\$ 27,543</b> | <b>\$ 29,994</b> |

| NPV Per-Acre Comparison of Crop Net Returns   |    | 1996 Farm    | 2002 Farm  | FFA        |
|---|----|--------------|------------|------------|
|   |    | Bill         | Bill       | Amendment  |
| <b>Net Present Value of Expected Yearly Returns</b>   |    | <b>TOTAL</b> |            | \$ 437.89  |
| * Time period 1 is the time of first receipt of producer revenue, no Risk premium currently |    |              |            |            |
| One Year 2004   | 1  | \$ 27,883    | \$ 25,984  | \$ 28,296  |
| Four Years 2004 - 2007  | 4  | \$ 102,415   | \$ 95,438  | \$ 103,933 |
| Ten Years 2004 - 2013   | 10 | \$ 217,536   | \$ 202,717 | \$ 220,759 |
| Twenty Years 2004 - 2023  | 20 | \$ 339,007   | \$ 315,913 | \$ 344,030 |
| Perpetuity  | -  | \$ 492,603   | \$ 459,045 | \$ 499,902 |

| <b>Net Present Value of Expected Yearly Returns</b>   |    | <b>PER ACRE</b> |          |          |
|---|----|-----------------|----------|----------|
| * Time period 1 is the time of first receipt of producer revenue, no Risk premium currently |    |                 |          |          |
| One Year 2004   | 1  | \$ 279          | \$ 260   | \$ 283   |
| Four Years 2004 - 2007  | 4  | \$ 1,024        | \$ 954   | \$ 1,039 |
| Ten Years 2004 - 2013   | 10 | \$ 2,175        | \$ 2,027 | \$ 2,208 |
| Twenty Years 2004 - 2023  | 20 | \$ 3,390        | \$ 3,159 | \$ 3,440 |
| Perpetuity  | -  | \$ 4,926        | \$ 4,590 | \$ 4,999 |

|                                   |    |      |          |       |
|-----------------------------------|----|------|----------|-------|
| <b>Difference from Scenario 1</b> | 1  | \$ - | \$ (19)  | \$ 4  |
|                                   | 4  | \$ - | \$ (70)  | \$ 15 |
|                                   | 10 | \$ - | \$ (148) | \$ 32 |
|                                   | 20 | \$ - | \$ (231) | \$ 50 |
|                                   | -  | \$ - | \$ (336) | \$ 73 |

| <b>Net Present Value of Direct and Counter-Cyclical Payments</b>                            |    | <b>TOTAL</b> <i>(includes penal</i> |      |           |
|---|----|-------------------------------------|------|-----------|
| * Time period 1 is the time of first receipt of producer revenue, no Risk premium currently |    |                                     |      |           |
| One Year 2004   | 1  | \$ 1,900                            | \$ - | \$ 2,313  |
| Four Years 2004 - 2007  | 4  | \$ 6,977                            | \$ - | \$ 8,494  |
| Ten Years 2004 - 2013   | 10 | \$ 14,819                           | \$ - | \$ 18,042 |
| Twenty Years 2004 - 2023  | 20 | \$ 23,094                           | \$ - | \$ 28,117 |
| Perpetuity  | -  | \$ 33,558                           | \$ - | \$ 40,856 |

|                                   |    |      |             |          |
|-----------------------------------|----|------|-------------|----------|
| <b>Difference from Scenario 1</b> | 1  | \$ - | \$ (1,900)  | \$ 413   |
|                                   | 4  | \$ - | \$ (6,977)  | \$ 1,517 |
|                                   | 10 | \$ - | \$ (14,819) | \$ 3,223 |
|                                   | 20 | \$ - | \$ (23,094) | \$ 5,023 |
|                                   | -  | \$ - | \$ (33,558) | \$ 7,298 |

| <b>Net Present Value of Direct and Counter-Cyclical Payments</b>                            |    | <b>PER ACRE</b> <i>(includes penal</i> |      |        |
|---|----|--|------|--------|
| * Time period 1 is the time of first receipt of producer revenue, no Risk premium currently |    |  |      |        |
| One Year 2004   | 1  | \$ 19                                  | \$ - | \$ 23  |
| Four Years 2004 - 2007  | 4  | \$ 70                                  | \$ - | \$ 85  |
| Ten Years 2004 - 2013   | 10 | \$ 148                                 | \$ - | \$ 180 |
| Twenty Years 2004 - 2023  | 20 | \$ 231                                 | \$ - | \$ 281 |
| Perpetuity  | -  | \$ 336                                 | \$ - | \$ 409 |

|                                   |    |      |          |       |
|-----------------------------------|----|------|----------|-------|
| <b>Difference from Scenario 1</b> | 1  | \$ - | \$ (19)  | \$ 4  |
|                                   | 4  | \$ - | \$ (70)  | \$ 15 |
|                                   | 10 | \$ - | \$ (148) | \$ 32 |
|                                   | 20 | \$ - | \$ (231) | \$ 50 |
|                                   | -  | \$ - | \$ (336) | \$ 73 |