

# **AFPC**

**Agricultural & Food Policy Center**  
at Texas A&M University

## Base and Yield Update Option Analyzer



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A policy working paper is designed to provide economic research on a timely basis. It is an interim product of a larger AFPC research project which will eventually be published as a policy research report. These results are published at this time because they are believed to contain relevant information to the resolution of current policy issues. AFPC welcomes comments and discussions of these results and their implications. Address such comments to the author(s) at:

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## **Base and Yield Update Option Analyzer**

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The Base and Yield Update Option Analyzer (BYA) is a decision support tool for analyzing the economic consequences of the Base Acre and Payment Yield update options in the 2002 farm bill. The BYA is provided by Texas A&M University for educational purposes and is not intended to replace or duplicate the final FSA calculations done for individual farm numbers.

The 2002 farm bill offers farmers a one time opportunity to update base and payment yields. The BYA provides a comprehensive system for evaluating the economic consequences of selecting different update alternatives for each farm number before going to the FSA office.

The 2002 farm bill's base acre and program yield update opportunity is complicated by two factors: (a) the large number of options producers have been given, and (b) the fact that the counter-cyclical payment (CCP) is uncertain (risky) because it is based on a fixed target price and the fluctuating market price. This means that the CCP for a crop in any year can be anywhere between zero and the maximum. The option's producers have been given are summarized as:

### **– Base acre update options**

1. Retain 2002 production flexibility contract (PFC) acres for all years.
2. Retain 2002 PFC acres and add oilseed base acres without offsetting PFC acres.
3. Retain 2002 PFC acres and add maximum oilseed base acres with maximum offset of PFC acres.
4. Update base acres for all crops using 1998-01 average planted acres.
5. Retain 2002 PFC acres and add oilseed base acres with offset to maximize expected government payments.

### **– Payment yield options**

6. Freeze 2002 PFC payment yields for non-oilseed crops and do not develop PFC payment yields for oilseeds.
7. Freeze 2002 payment yields for non-oilseed crops and establish payment yields for oilseeds.
8. Establish payment yields for all crops using 70 percent of increase in yield over 2002 PFC payment yield.
9. Establish payment yield for all crops using 93.5 percent of the weighted average of 1998-2001 yields.

The acceptable combinations of the five base acre options and four payment yield options, gives producers seven alternatives to choose from:

– **Permitted Base Acre and Payment Yield Update Alternatives**

- A. Retain 2002 PFC acres and payment yields and do not add oilseeds.
- B. Retain 2002 PFC acres and add oilseed base acres without offset, freeze non-oilseed 2002 PFC yields and establish oilseed payment yields.
- C. Retain 2002 PFC acres and add oilseed base acres with maximum offset, freeze non-oilseed 2002 PFC payment yields and establish oilseed payment yields.
- D. Retain 2002 PFC acres and add oilseed base acres to maximize government payments, freeze non-oilseed payment yields and establish oilseed payment yields.
- E. Update all base acres, freeze non-oilseed 2002 PFC payment yields and establish oilseed payment yields.
- F. Update all base acres and establish payment yields for all crops using the 70 percent formula.
- G. Update all base acres and establish payment yields for all crops using the 93.5 percent formula.

Producers are allowed to update base acres and establish payment yields using a different option for each farm number. The formula selected for establishing payment yield must be the same for all crops on a farm number.

**Input for the BYA**

The BYA as a decision support system is available on both the FSA and the AFPC web site. The decision support program guides the user through the process of entering a farm number’s data and produces a report summarizing the results of calculating government payments for the seven different base and yield update alternatives.

The BYA first asks the producer to indicate the State and County where the farm unit is located. The State and County values allow the BYA to pull in county average yield and similar farm’s payment yield information that may be used as a “plug” in the updating calculations. Next, the program asks the producer to indicate which program crops were produced on the farm unit in 1998-01 or have historical base acres on the farm unit. Program crops referred to as “covered commodities” in the 2002 farm bill are: wheat, corn, grain sorghum, barley, oats, upland cotton, rice, soybeans, sunflowers, canola, rapeseed, flaxseed, mustard, and safflower.

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**Please select your state and then your county.**

State:

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The producer must specify the crops on the farm using a standard format. If the crop was produced as either irrigated or non-irrigated, then check the appropriate box and proceed. If, however, the crop is grown under irrigation and non-irrigation practices you MUST select the combined practice. Specify all crops that were produced on the farm in 1998-2001 or have a 2002 PFC acreage base. When crops are planted as a replant or subsequent crop, you must specify which crop you want to claim. For example a 100 acre cotton farm that was hailed out in June of 2001 and planted sorghum as a subsequent crop, can claim either 100 acres of cotton OR 100 acres of sorghum in that year, but not both.

**Please enter information about your farm for crops produced in 1998-01 and crops with historical base acres and payment yields.**

Exit

	FSA Certified Irrigated Practice <sup>1</sup>	Non-Irrigated Production Practice	Combined Irrigated/Non-Irrigated Practice <sup>2</sup>
Cotton	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wheat	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sorghum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Corn	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Barley	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Oats	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Rice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Soybeans	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sunflowers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flaxseed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Canola	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rapeseed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safflower	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mustard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**If Information from FSA lists "subsequent acres" for one or more years you MUST choose which crop to use in the base updating process. Subsequent acres may not be counted twice.**

Glossary of Terms

<sup>1</sup>FSA certified irrigated acres  
<sup>2</sup>Use this option if FSA does not breakout acres and yield by production practice. If you select combined, you cannot select the irrigated or non-irrigated production practices.

Submit

Total direct and counter-cyclical payment (DCP) cropland acres on the farm, as specified by the FSA, are entered for the farm being analyzed. Acres of cropland normally planted twice per year (double cropped) to program crops is also required as input.

The producer must enter the following values for each program crop on the farm unit:

- 2002 PFC (production flexibility contract) or base acres,
- 2002 PFC payment yield,
- Actual annual planted acres 1998-2001, and
- Proven yields per planted acre or total production for 1998-2001. If a crop is produced under irrigated and non-irrigated practices, then you must enter annual production rather than yield.
- The user's expected share of the crop for 2002-2007 as a percentage.

Corn Irrigated

2002 PFC Acres		80			
2002 PFC Yield (bu.)		100			
Similar Farm's 2002 PFC Yield (bu.)		87.1			
County Average Yield 1998-01 (bu.)		150			

	1998	1999	2000	2001
Total Planted Acres	80	80	80	80
Proven Yield/Planted Acre or Proven Production (bu.)	140	80	135	150
Specify whether entered yield or production	<input checked="" type="radio"/> Yield		<input type="radio"/> Production	
Your share of the crop (%)	100			

The BYA software provides the following county level values for each crop using the internal data bases provided by FSA.

1. Farm payment yield for similar farms (county average PFC payment yield is used), and
2. Average annual county yields for 1998-2001. Data for the county yield data were provided by FSA and reflect the NASS county average yields, corrected for missing data.

If yield values are not available in the data base, the cells for these variables are blank. The user must enter appropriate values for these variables. Also, if the user wants to use different values than supplied by the data base, you may enter your own values.

The BYA allows the user to also analyze the base and yield update alternatives using the producer's projected crop prices. This allows the user to compare the expected government payments for each alternative under alternative prices.

### Results from the BYA

The BYA uses the user's input data to calculate updated PFC base acres and payment yields for each crop, given the formulas specified in the farm bill. Calculations used to estimate updated base acres and program yields are described in the next two sections. The output for BYA is presented in several different types of tables.

- **Summary Table** Average annual government payments for each alternative are summarized for three methods of calculating the payments. The first column reflects average annual payments (2002-2007) received if the projected prices provided by the producer are observed for each year. The second column reflects the payments if prices are so high that there are no counter-cyclical payments any year. The last column in the table indicates the average annual payments for the life of the bill if prices are less than the loan rate each year so counter-cyclical payments are maximized. Alternatives A-G in the table below also indicate their associated base and yield update option by the number in parenthesis.

Table 1. Summary: Average Annual Government Payments Calculated Three Ways for The FSA Example

Alternatives for Updating	Producers Projected Prices	Direct Payments Only	Direct & Max CC Payments
A. Freeze 2002 Base (1) and Yields (6)	3874.	2185.	5123.
B. Add Min Oilseeds (2) and Yields (7)	4960.	2820.	6279.
C. Add Max Oilseeds (3) and Yields (7)	5128.	2921.	6338.
D. Max Payment O/S (5) and Yields (7)	5128.	2921.	6338.
E. Update Base (4) Freeze Yields (7)	5128.	2921.	6338.
F. Update Base (4) & Yields 70% (8)	5598.	2921.	7079.
G. Update Base (4) & Yields 93.5% (9)	5612.	2921.	7105.

- **Base Acre Options Table** summarizes the calculated base acres for Options 1-5. The base acres used to calculate direct and counter-cyclical payments are calculated five ways under the farm bill (Options 1-5). The BYA compresses the table and skips Options 2, 3 and 5 if the farm has no oilseeds.

Table 2. Base Acre Options: Final Calculated Base Acres for Options 1-5, After Excess Base Acre Rule

Crop Name	2002 PFC Acres (Option 1)	Min Oilseed Retain PFCs (Option 2)	Max Oilseed Offset PFCs (Option 3)	Update All Base Acres (Option 4)	Max Payment Offset PFCs (Option 5)
Wheat	15.00	15.00	0.00	0.00	0.00
Corn	80.00	80.00	80.00	80.00	80.00
Oats	15.00	15.00	0.00	0.00	0.00
Soybeans	0.00	50.00	80.00	80.00	80.00
Total Base Acres	110.00	160.00	160.00	160.00	160.00

- **Payment Yield Options Table** summarizes the calculated payment yields used for counter-cyclical payments (Options 6-9), as well as the payment yields for direct payments. The BYA compresses the table and skips Option 7 if the farm has no oilseeds.

Table 3. Payment Yield Options: Calculated Farm Payment Yields for Direct and Counter-Cyclical Payments

Crop Name	Direct Payment Yield	2002 PFC Yield (Option 6)	Only Establ. Oilseed Yield (Option 7)	70% Incr. in Yield (Option 8)	93.5% of Average Yield (Option 9)
Wheat	40.00	40.00	40.00	12.00	0.00
Corn	100.00	100.00	100.00	123.00	124.00
Oats	50.00	50.00	50.00	15.00	0.00
Soybeans	34.00	0.00	34.00	40.00	40.00

- **Actual Input Data Tables** summarize the farm's input data entered by the user. These data include annual planted acres, proven yields, 2002 PFC acres, payment yields, county average yields, and similar PFC payment yields. The user's projected annual crop prices for 2002-2007 are summarized in Table 7.

Table 4. Actual Input Data: 2002 Production Flexibility Contract (PFC) Acres and Planting History, 1998-2001

Crop Name	2002 PFC Acres	-----Planted Acre History-----				% Share of the Crop
		1998	1999	2000	2001	
Wheat Irr	15.0	0.0	0.0	0.0	0.0	100.0
Corn Irr	80.0	80.0	80.0	80.0	80.0	100.0
Oats Irr	15.0	0.0	0.0	0.0	0.0	100.0
Soybeans Irr	0.0	80.0	80.0	80.0	80.0	100.0
Totals	110.0	160.0	160.0	160.0	160.0	

Table 5. Actual Input Data: 2002 PFC Payment Yield, Similiar Farm Payment Yield, and Producer Proven Yield or Production History, 1998-2001

Crop Name	2002 PFC Pymt Yield	Similiar Pymt Yield	--Producer Proven Yields or Production--			
			1998	1999	2000	2001
Wheat Irr	40.0	40.0	0.	0.	0.	0.
Corn Irr	100.0	100.0	140.	80.	135.	160.
Oats Irr	50.0	50.0	0.	0.	0.	0.
Soybeans Irr	0.0	0.0	45.	28.	48.	50.

- **County Plug Yields** Acres for irrigated and non-irrigated crops are summed to comply with FSA’s rule for dealing with these two practices as one crop. Yields for irrigated and non-irrigated crops are averaged to create a weighted average yield. Adjustments are also made to deal with irrigated and non-irrigated production practices to calculate weighted average county yields using the average mix of irrigated and dryland planted acres on the farm.

Table 6. Actual Input Data: County Average Yields, Average Annual Acres Planted, and Calculated Yield Plugs

Crop Name	NASS County Avg Yield	Average Planted Acres	Weighted County Avg Yield	Low Yield Plugs
Wheat Irr	45.0	0.0	45.0	33.8
Corn Irr	130.0	80.0	130.0	97.5
Oats Irr	55.0	0.0	55.0	41.3
Soybeans Irr	40.0	80.0	40.0	30.0

Table 7. Input Data: Producers Projected Annual Prices Used for the Analysis

Crop Name	2002	2003	2004	2005	2006	2007
Wheat (\$/bu)	2.95	2.93	3.04	3.07	3.17	3.23
Corn (\$/bu)	2.03	2.04	2.10	2.15	2.19	2.23
Oats (\$/bu)	1.27	1.27	1.28	1.29	1.29	1.30
Soybeans (\$/bu)	4.44	4.68	4.83	4.96	5.07	5.21

- **Data Processing Tables** summarize the calculations necessary to calculate updated base acres and payment yields. The first table presents the adjusted proven yields with county plugs used to calculate farm program yields for the crops grown on the farm unit.

Table 8. Data Processing: Producer Proven Yields with Plugs and Calculated Weighted Average Yield

Crop Name	1998	1999	2000	2001	Average
Wheat	0.0	0.0	0.0	0.0	0.0
Corn	140.0	97.5	135.0	160.0	133.1
Oats	0.0	0.0	0.0	0.0	0.0
Soybeans	45.0	30.0	48.0	50.0	43.3



Table 9. Data Processing: Planted Acres History by Crop and Average Planted Acres, 1998-2001

Crop Name	-----Total Planted Acres-----				1998-01
	1998	1999	2000	2001	Average
Wheat	0.0	0.0	0.0	0.0	0.0
Corn	80.0	80.0	80.0	80.0	80.0
Oats	0.0	0.0	0.0	0.0	0.0
Soybeans	80.0	80.0	80.0	80.0	80.0
Totals	160.0	160.0	160.0	160.0	160.0

Table 10. Data Processing: Excess Oilseed Acres Not Eligible for Calculating Base Acres Under Option 2

Crop Name	1998	1999	2000	2001
Soybeans	-30.0	-30.0	-30.0	-30.0

Table 11. Data Processing: Maximum Eligible Oilseed Acres Under Option 2

Crop Name	1998	1999	2000	2001	Average
Soybeans	50.0	50.0	50.0	50.0	50.0

Table 12. Data Processing: Non-Oilseed PFC Acres Offset to Maximize Oilseed Base Acres Under Option 3

Crop Name	Acres Offset	Change in Payments (\$)
Wheat	-15.0	-289.
Corn	0.0	0.
Oats	-15.0	-22.
Soybeans	30.0	699.

Table 13. Data Processing: Non-Oilseed PFC Acres Offset to Maximize Payments Under Option 5

Crop Name	Acres Offset	Change in Payments (\$)
Wheat	-15.0	-289.
Corn	0.0	0.
Oats	-15.0	-22.
Soybeans	30.0	699.

- **Annual Payment Rate Tables** summarize the annual direct and counter cyclical payment rates for each of the crops. Annual counter cyclical payment rates for the user's projected prices are summarized in the second table.

Table 14. Annual Payment Rates Used to Calculate Direct Payments for the Analysis

Crops	2002	2003	2004	2005	2006	2007
Wheat	0.5200	0.5200	0.5200	0.5200	0.5200	0.5200
Corn	0.2800	0.2800	0.2800	0.2800	0.2800	0.2800
Oats	0.0240	0.0240	0.0240	0.0240	0.0240	0.0240
Soybeans	0.4400	0.4400	0.4400	0.4400	0.4400	0.4400

Table 15. Annual Counter Cyclical Payment Rates Used for the Producers Projected Prices

Crops	2002	2003	2004	2005	2006	2007
Wheat	0.3917	0.4061	0.3606	0.3342	0.2255	0.1743
Corn	0.2895	0.2797	0.2511	0.2038	0.1626	0.1249
Oats	0.0260	0.0260	0.0860	0.0860	0.0860	0.0860
Soybeans	0.3600	0.3600	0.3600	0.3600	0.2852	0.1451

- **Constant Price Scenario Results Tables** summarize the results from simulating the farm unit for seven base acre and payment yield alternatives (A-G) using the projected crop prices provided by the user. A separate Producer Price Results Table is printed when the user requests the Maximum Output and provides for each crop, a summary of the average annual government payments (in nominal dollars).

Table 17. Producer Price Results: Corn, Government Payments Calculated Using Producers Annual Prices  
These results were calculated using projected prices entered by the user and do not reflect any price risk.

	2002	2003	2004	2005	2006	2007	Total
<b>Direct Payments</b>							
A. Freeze 2002 Base (1)	1904.	1904.	1904.	1904.	1904.	1904.	11424.
B. Add Min Oilseeds (2)	1904.	1904.	1904.	1904.	1904.	1904.	11424.
C. Add Max Oilseeds (3)	1904.	1904.	1904.	1904.	1904.	1904.	11424.
D. Max Payment O/S (5)	1904.	1904.	1904.	1904.	1904.	1904.	11424.
E. Update Base (4)	1904.	1904.	1904.	1904.	1904.	1904.	11424.
F. Update Base (4)	1904.	1904.	1904.	1904.	1904.	1904.	11424.
G. Update Base (4)	1904.	1904.	1904.	1904.	1904.	1904.	11424.
<b>Counter Cyclical Payments</b>							
A. Freeze 2002 Base (1) and Yields (6)	1969.	1902.	1707.	1386.	1106.	849.	8919.
B. Add Min Oilseeds (2) and Yields (7)	1969.	1902.	1707.	1386.	1106.	849.	8919.
C. Add Max Oilseeds (3) and Yields (7)	1969.	1902.	1707.	1386.	1106.	849.	8919.
D. Max Payment O/S (5) and Yields (7)	1969.	1902.	1707.	1386.	1106.	849.	8919.
E. Update Base (4) Freeze Yields (7)	1969.	1902.	1707.	1386.	1106.	849.	8919.
F. Update Base (4) & Yields 70% (8)	2421.	2339.	2100.	1705.	1360.	1045.	10970.
G. Update Base (4) & Yields 93.5% (9)	2441.	2358.	2117.	1718.	1371.	1053.	11059.
<b>Total Payments</b>							
A. Freeze 2002 Base (1) and Yields (6)	3873.	3806.	3611.	3290.	3010.	2753.	20343.
B. Add Min Oilseeds (2) and Yields (7)	3873.	3806.	3611.	3290.	3010.	2753.	20343.
C. Add Max Oilseeds (3) and Yields (7)	3873.	3806.	3611.	3290.	3010.	2753.	20343.
D. Max Payment O/S (5) and Yields (7)	3873.	3806.	3611.	3290.	3010.	2753.	20343.
E. Update Base (4) Freeze Yields (7)	3873.	3806.	3611.	3290.	3010.	2753.	20343.
F. Update Base (4) & Yields 70% (8)	4325.	4243.	4004.	3609.	3264.	2949.	22394.
G. Update Base (4) & Yields 93.5% (9)	4345.	4262.	4021.	3622.	3275.	2957.	22483.

Direct payments calculated using : Direct Payment Rate \* Base Acres \* Direct Payment Yield \* 0.85 \* Share

A. DIR PAY YR 1 =	1904.	=	80.0	BASE *	100.0	PAYMENT YIELD * 0.2800	DP RATE * 0.85	FRACTION * 1.00	SHARE
B. DIR PAY YR 1 =	1904.	=	80.0	BASE *	100.0	PAYMENT YIELD * 0.2800	DP RATE * 0.85	FRACTION * 1.00	SHARE
C. DIR PAY YR 1 =	1904.	=	80.0	BASE *	100.0	PAYMENT YIELD * 0.2800	DP RATE * 0.85	FRACTION * 1.00	SHARE
D. DIR PAY YR 1 =	1904.	=	80.0	BASE *	100.0	PAYMENT YIELD * 0.2800	DP RATE * 0.85	FRACTION * 1.00	SHARE
E. DIR PAY YR 1 =	1904.	=	80.0	BASE *	100.0	PAYMENT YIELD * 0.2800	DP RATE * 0.85	FRACTION * 1.00	SHARE
F. DIR PAY YR 1 =	1904.	=	80.0	BASE *	100.0	PAYMENT YIELD * 0.2800	DP RATE * 0.85	FRACTION * 1.00	SHARE
G. DIR PAY YR 1 =	1904.	=	80.0	BASE *	100.0	PAYMENT YIELD * 0.2800	DP RATE * 0.85	FRACTION * 1.00	SHARE

Counter Cyclical payments calculated using: CCP Payment Yield \* Base Acres \* 0.85 \* CCP Rate \* Share.  
CCP Rate = (Counter Cyclical Price - Direct Payment Rate - Maximum (Loan Rate or Market Year Average Price))

A. CC PAY YR 1 =	1969.	=	80.0	BASE *	100.0	PAYMENT YIELD * 0.2895	CC RATE * 0.85	FRACTION * 1.00	SHARE
B. CC PAY YR 1 =	1969.	=	80.0	BASE *	100.0	PAYMENT YIELD * 0.2895	CC RATE * 0.85	FRACTION * 1.00	SHARE
C. CC PAY YR 1 =	1969.	=	80.0	BASE *	100.0	PAYMENT YIELD * 0.2895	CC RATE * 0.85	FRACTION * 1.00	SHARE
D. CC PAY YR 1 =	1969.	=	80.0	BASE *	100.0	PAYMENT YIELD * 0.2895	CC RATE * 0.85	FRACTION * 1.00	SHARE
E. CC PAY YR 1 =	1969.	=	80.0	BASE *	100.0	PAYMENT YIELD * 0.2895	CC RATE * 0.85	FRACTION * 1.00	SHARE
F. CC PAY YR 1 =	2421.	=	80.0	BASE *	123.0	PAYMENT YIELD * 0.2895	CC RATE * 0.85	FRACTION * 1.00	SHARE
G. CC PAY YR 1 =	2441.	=	80.0	BASE *	124.0	PAYMENT YIELD * 0.2895	CC RATE * 0.85	FRACTION * 1.00	SHARE

– **Calculations for Updating Base Acres**

The 2002 farm bill provides five options for “updating” base acres for all crops.

- **Option 1** freezes the base acres for covered crops at their 2002 PFC base acres and does not allow adding soybean and minor oilseed base acres.
- **Option 2** freezes the 2002 PFC acres for all non-oilseed crops and calculates base acres for oilseeds using the 1998-2001 average of eligible oilseed acres on the farm. Eligible oilseed acres are calculated for each year as acres planted and considered planted for harvest, grazing, haying, silage or other similar purposes for 1998-2001. Total eligible oilseed acres each year may not exceed the difference between planted and considered planted acres for all crops and the sum of current base acres.
- **Option 3** freezes the current PFC acres for non-oilseed crops and maximizes oilseed base acres using the maximum eligible oilseed acres and offsetting PFC acres for non-oilseed crops. Given the complexity and choices involved with using Option 3 for calculating base acres, the BYA takes several steps to calculate eligible oilseed acres and the offset of non-oilseed PFC acres:
  1. Oilseed base acres initially are set equal to their minimums.
  2. Oilseed base acres for the crop with the largest expected government payment per acre are increased to the maximum by offsetting base acres from the non-oilseed crop with the lowest expected payments. If the base acres for a non-oilseed crop is reduced to zero and oilseed base acres are not at the maximum, base is offset from the non-oilseed crop with the next lowest government payment. The maximum base acres for an oilseed crop is its average planted acres 1998-01.
  3. The process in step 2 is repeated for other oilseed crops until each oilseed has its maximum number of oilseed acres or there are no more non-oilseed base acres to offset.
- **Option 4** updates base acres for all covered crops by using a four-year average of planted and considered planted acres for each covered commodity. The farm bill specifically includes acreage that was planted or considered planted for “harvest, grazing, haying, silage or other similar purposes for the 1998-2001 crop years.”
- **Option 5** freezes the current PFC acres for non-oilseed crops and allows farmers to offset non-oilseed acres so as to maximize government payments. Given the complexity and choices involved with using Option 5 for calculating base acres, the BYA takes several steps to calculate eligible oilseed acres and the trade-off of non-oilseed base:
  1. Oilseed base acres initially are set equal to their minimums.
  2. Oilseed base acres for the crop with the largest expected government payment per acre are increased to the maximum by offsetting non-oilseed base acres if expected payments for the oilseed exceed payments for a non-oilseed crop. BYA checks

expected payments for all non-oilseed crops and offsets their base acres to the oilseed crops if payments would be increased.

3. In the final solution, base acres for non-oilseed crops that have low expected payments are generally set to zero and base acres for oilseeds with high expected payments equal their maximums. Maximum oilseed base acres is the average planted acres for 1998-01.

The farm bill has a provision to prevent excess base acres. The rule is that the sum of base acres must be less than or equal to actual cropland plus double crop acres for the farm. The excess base acres rule applies to Options 2, 3, 4, and 5. If calculated base acres exceeds actual cropland plus double crop acres, base acres must be reduced. The BYA program reduces the base acres for the crop(s) with the lowest expected government payment until total base is in compliance with this rule. The final updated base acres for all covered commodities are summarized in the Final Calculated Base Acres Table after adjustments are made for the excess base acres rule.

### **Calculations for Establishing Payment Yield**

The 2002 farm bill establishes two different payment yields: one for CCPs and another for Direct payments. The CCP payment yields are updated using the producer's actual planted acre yields for 1998-2001, adjusted for low values. In years when the actual planted acre yield is less than 75 percent of the 1998-2001 county average yield, producers can replace their yield with 75 percent of the county average yield.

The farm bill provides four options for updating farm program yields for CCP payments. The option numbers correspond to the BYA output tables.

- **Option 6:** Keep 2002 PFC payment yields for covered commodities. (This option does not allow establishment of CCP payment yields for oilseeds.)
- **Option 7:** Calculate farm program yields for oilseeds if the producer elects to only update oilseed base acres. In this case oilseed payment yields equal a fraction (for soybeans it is 78 percent) of average actual and adjusted yields for 1998-2001 on the farm unit.
- **Option 8:** Update payment yields for all covered crops using producer's actual 1998-01 average yield and the current farm program yield as:  
New FPY = PFC payment yield + 0.70 \* (average 1998-01 yield - PFC payment yield)
  - Average 1998-01 yield is calculated using a weighted average yield for only the years when the crop was produced.
  - If a non-oilseed crop does not have a current payment yield, the Secretary will assign a value based on similar farms. The county average payment yield is used as the assumed value for "similar farms" payment yield in the BYA.
  - For soybeans and minor oilseeds, the value used for "PFC payment yield" in the formula is 78 percent of the farm's 1998-01 average yield.

- **Option 9:** Update payment yields for all covered crops using 93.5 percent of the weighted average proven and adjusted yields for 1998-01, ignoring years when the crop was not planted.

The payment yield used to calculate Direct payments for covered commodities is the 2002 PFC payment yield or equivalent. For historical program crops that do not have an assigned program yield on the farm, the farm bill assigns a value using the payment yield for similar farms. For soybeans and minor oilseeds, the payment yield used to calculate direct payments is a fraction (such as, 78 percent) of average yields 1998-01 on the farm unit.

### **Analysis Procedure**

Given the permitted combinations of updating base acres and payment yield the producer has seven alternatives to analyze. The permitted alternatives for each farm unit are:

- A. Retain 2002 PFC base acres and freeze 2002 PFC payment yields: Options 1 and 6,
- B. Retain 2002 PFC acres for non-oilseed crops, add minimum oilseed base acres, freeze 2002 PFC payment yields for non-oilseed crops, and establish oilseed payment yields: Options 2 and 7,
- C. Retain 2002 PFC acres for non-oilseed crops and add the maximum oilseed base acres to existing 2002 PFC base acres by offsetting base acres for non-oilseed crops, freeze 2002 PFC payment yields for non-oilseed crops, and establish oilseed payment yields: Options 3 and 7,
- D. Retain 2002 PFC acres for non-oilseed crops and add oilseed base acres to maximize government payments, freeze 2002 PFC payment yields for non-oilseed crops, and establish oilseed payment yields: Options 5 and 7,
- E. Update base acres for all crops using the 1998-01 average of planted acres, freeze 2002 payment yields for non-oilseed crops, and establish oilseed payment yields: Options 4 and 7,
- F. Update base acres for all crops using the 1998-01 average of planted acres and establish payment yields for all crops using the 70 percent formula: Options 4 and 8, or
- G. Update base acres for all crops using the 1998-01 average of planted acres and establish payment yields using the 93.5 percent formula: Options 4 and 9.

To compare the economic consequences of the seven alternatives, BYA calculates annual government payments for each crop in 2002-2007 for each alternative using the producer's projected market prices. In addition to doing a constant price or "no risk" analysis, the BYA analyzes government payments for each alternative under a "worst" and a "best" case situation. The constant price scenario assumes the user's projected prices for 2002-2007 are observed and

calculates the implied CCP rates accordingly. The “worst case” scenario assumes that crop prices exceed the counter cyclical prices each year for all crops and producers receive only the Direct payments in all years. The “best case” scenario assumes crop prices are less than the loan rates in all years and producers receive the maximum CCP rates plus the Direct payment.

### **Assumptions**

The opportunity to update base acres includes two decision points where producers can opt to reduce non-oilseed base acres and increase oilseed eligible acres and base acres. The BYA assumes producers would elect to reduce base acres for non-oilseed crops if the expected per base acre government payments for these crops are less than government payments for oilseeds.

Another decision comes if total base acres exceeds total cropland acres. The BYA assumes producers will reduce the necessary base acres from the crops with the lowest per base acre expected government payments.

The BYA evaluates both of these decisions, or options, based on the one that would maximize government payments. That criterion is chosen because the CCP and the Direct payments are both decoupled from the production decision.

### **Summary**

The results of the BYA should be reviewed carefully before making the decision to update base and payment yields on each farm number. The trade-off of non-oilseed base to gain oilseed eligible acres and the choice of sacrificing base to meet the excess base requirements should be reviewed closely. The crops selected for base acre reduction by BYA should be reviewed closely by the producer before making the final decision.

The BYA program is provided as a decision support tool to assist producers in analyzing their options for updating base acres and farm program yields. The computer program calculates base acres and payment yields using formulas described in the 2002 farm bill, but producers are advised to consult with FSA county directors when making this one time decision. The BYA results are offered as a decision support, not a forecast or recommendation.

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