



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Analysis of Barley Market Developments and Policy Options

FAPRI-UMC Report #15-06
August 2006

Prepared by the Food and Agricultural Policy Research Institute

101 Park DeVille Drive, Suite E
Columbia, Missouri 65203
573-882-3576
www.fapri.missouri.edu



Published by the Food and Agricultural Policy Research Institute (FAPRI), University of Missouri-Columbia, 101 Park DeVille Drive, Suite E, Columbia, MO 65203, August 2006.

<http://www.fapri.missouri.edu>

Material in this publication is based upon work supported by the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture.

Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the authors and do not necessarily reflect the view of the U.S. Department of Agriculture.

Permission is granted to reproduce this information with appropriate attribution to the Food and Agricultural Policy Research Institute.

The University of Missouri is non-discriminatory relative to race, religion, color, national origin, sex, sexual orientation, age, disability or status as a Vietnam-era veteran. Any person having inquiries should contact Human Resource Services, University of Missouri-Columbia, 130 Heinkel Building, Columbia, MO 65211, (573) 882-4256.

Summary

The Food and Agricultural Policy Research Institute (FAPRI) has examined various issues related to the U.S. barley industry in response to a request from Senators Crapo, Conrad, Dorgan, and Craig and Representatives Simpson, Otter, and Pomeroy.

U.S. barley acreage has declined by more than half since the early 1990s. In the states accounting for the bulk of U.S. barley production, wheat acreage has also declined, while corn and soybean acreage has increased, and more land has been enrolled in the conservation reserve.

Producer returns can explain many of the observed changes in acreage. In the Northern Plains, for example, wheat and barley returns have been weak relative to returns for corn and soybeans, with both market returns and government payments playing a role.

With the help of the National Barley Growers Association (NBGA), three alternative policy scenarios were selected for analysis.

1. A 10% increase in barley loan rates,
2. Elimination of the marketing loan program for all commodities, and
3. Elimination of the loan program combined with an increase in direct payments that would hold overall government spending on each commodity at current-policy levels.

The policy alternatives were evaluated relative to FAPRI's stochastic baseline prepared in early 2006. The stochastic baseline assumes a continuation of current farm programs, but looks at 500 alternative market outcomes based on different assumptions about the weather and other supply and demand conditions. Major results from the analysis include:

- An increase in the barley loan rate would increase average barley producer returns, resulting in a 2.1% increase in average barley acreage. The increase in barley production would increase domestic use and exports of barley and slightly reduce barley market prices.
- Higher barley loan rates would also result in marginal reductions in acreage for competing crops and an increase in government spending.
- Eliminating the loan program would reduce acreage for barley and several other crops, especially those most dependent on marketing loan benefits. Upland cotton and rice would experience the largest proportional reductions in producer returns and acreage. Average wheat acreage, in contrast, would actually increase as producers switch to wheat from other crops.
- Increasing direct payments could offset the producer income impacts of eliminating the marketing loan program for producers with sufficient base acreage, but would have only modest effects on acreage decisions relative to the scenario that simply eliminates the loan program without compensation.

Analysis of Barley Market Developments and Policy Options

In response to a request from Senators Crapo, Conrad, Dorgan, and Craig and Representatives Simpson, Otter, and Pomeroy, the Food and Agricultural Policy Research Institute (FAPRI) has examined various issues related to the U.S. barley industry.

The March 22, 2006 request letter (Appendix A) poses two questions:

- 1) “What specific provisions and to what extent are the various components of the 2002 Farm Bill contributing to the decline in the planted acreage of barley in the U.S.?”
- 2) “What modifications to the current U.S. barley program could be made in future agriculture policy to reverse this trend and put barley in a more equitable position relative to other program crops?”

As suggested in the letter, FAPRI has discussed the request with representatives of the National Barley Growers Association (NBGA). Based in part on those discussions, FAPRI agreed to prepare this report, divided into two sections. The first section is largely a review of recent developments in barley markets, identifying trends in barley acreage, supply, and demand and examining some possible explanations for those trends. The second section examines three alternative policy scenarios that NBGA indicated would be of interest.

FAPRI will neither endorse nor oppose any particular policy option, but will provide information about possible consequences. No judgment will be offered as to what would constitute “a more equitable position” for barley relative to other program crops, but implications of current and alternative policies will be examined.

Barley Market Trends

Acreage of barley and other crops

The request letter suggests concern regarding the sharp decline in barley acreage. As recently as 1991, U.S. producers planted almost 9 million acres of barley. The June 30, 2006 *Acreage* report from USDA indicated that less than 3.5 million acres of barley were planted this year. Acreage has declined in all of the major barley-producing states in recent years (Figure 1).

Six states historically dominated U.S. barley production and together account for approximately 80% of the barley planted in the United States this year: North Dakota (1.05 million acres), Montana (800,000), Idaho (560,000), Washington (205,000), Minnesota (115,000) and South Dakota (55,000). By 2006, South Dakota barley area had dipped below that of California, Oregon, Wyoming, and Virginia.

What has happened to land that was formerly planted to barley? FAPRI compared acreage in the first years of the 1996 farm bill (a simple average of 1996 and 1997 acreage) to current acreage (a simple average of 2005 and 2006). For the six major barley states cited above, barley area declined by 2.7 million acres (Figure 2), and the national decline in barley area was 3.2 million acres.

Over the same period, there was an even larger decline in wheat acreage—wheat area fell by 6.9 million acres in the six major barley states. Corn and soybean area increased as barley and wheat area fell. Corn acreage increased in the six state region by about 1.5 million acres, and soybean area increased by 4.0 million acres. Other crops grown in the six states showed little net change in acreage. The total area devoted to canola, oats, sorghum, sugar beets, and sunflowers declined by about 200,000 acres between 1995-96 and 2005-06. Hay acreage declined by about 100,000 acres.

The total amount of land enrolled in the Conservation Reserve Program (CRP) in the six states increased approximately 1.7 million acres between 1995-96 and 2005-06. Over the same period, the total amount of land devoted to the listed crops and enrolled in the CRP declined by about 2.7 million acres in the six states. It is common in the Plains region for the amount of land devoted to crop production to increase and decrease in response to weather and economic conditions.

Figure 1. U.S. barley area planted, 1990-2006.

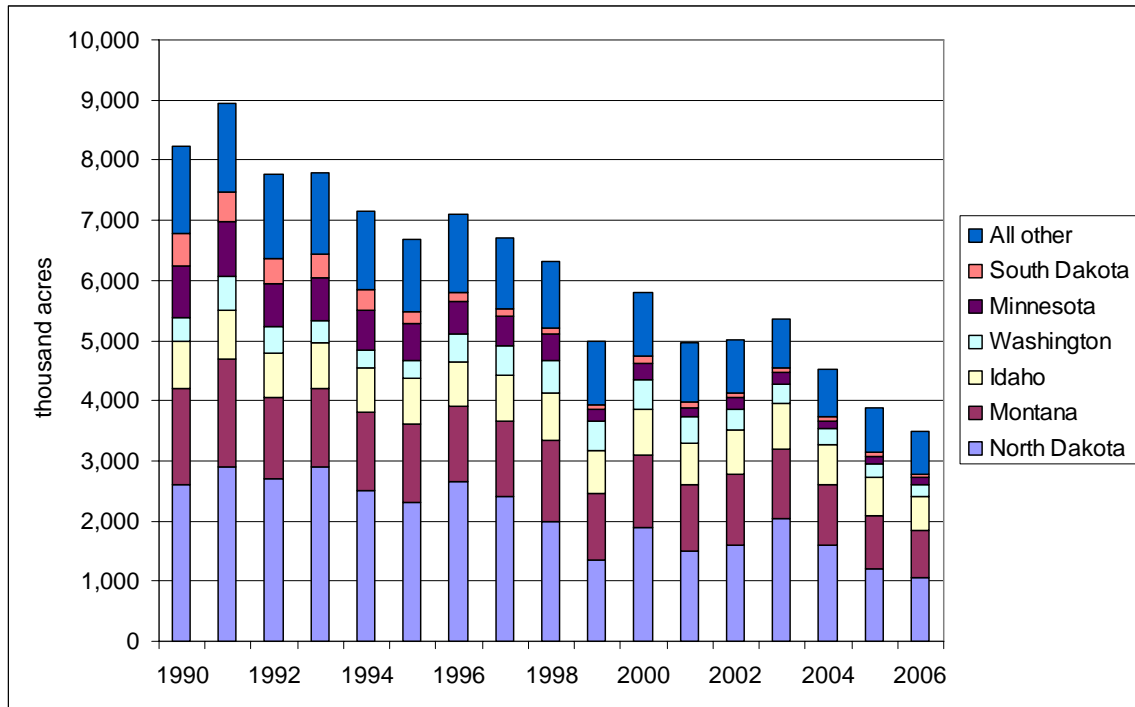
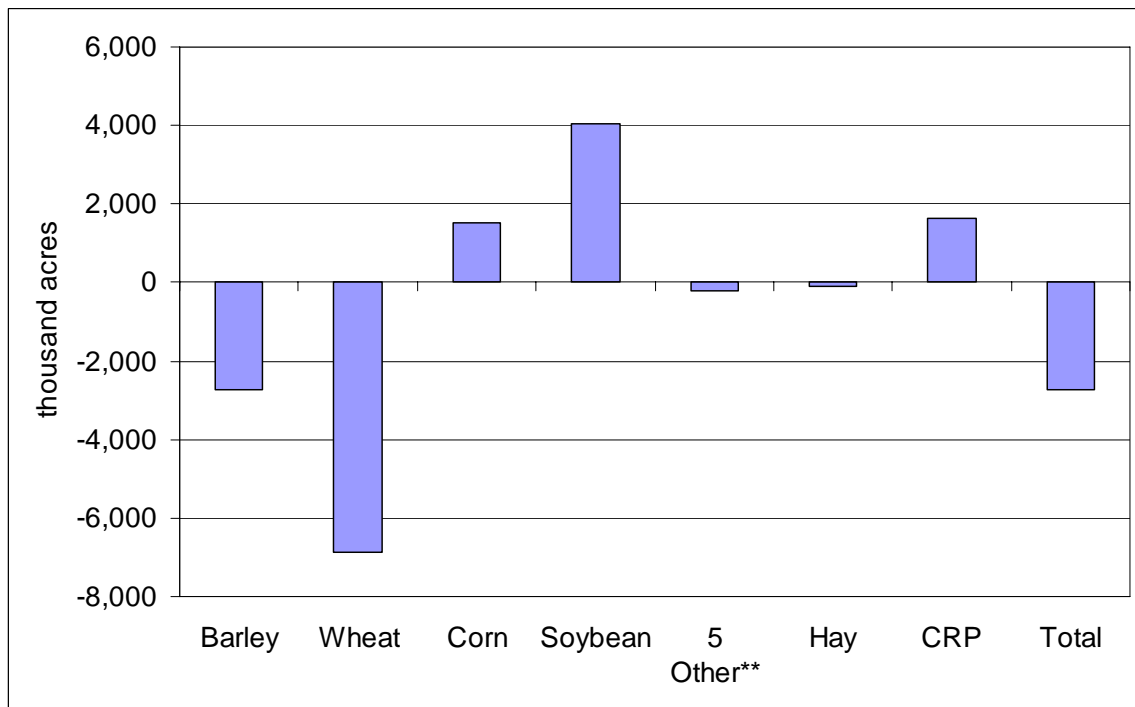


Figure 2. Change in land use in 6 barley states*, 2005-06 avg. vs. 1996-97 avg.



*North Dakota, Montana, Idaho, Washington, Minnesota, and South Dakota

**Canola, oats, sorghum, sugar beets, and sunflowers

Although it is useful to examine national statistics and totals for the major barley producing states, the aggregate statistics may hide important developments at the state and local level. Examining each of the major barley-producing states separately reveals some commonalities and some distinct developments (Table 1). Using the same comparison of average acreage in 2005 and 2006 vs. average area in 1996 and 1997 yields the following patterns:

- In North Dakota, the increase in soybean and corn acreage and in land enrolled in the CRP accounts for most of the acreage lost to barley and wheat. The decline in aggregate acreage planted and idled is less than the decline in barley acreage.
- In Montana, soybeans are not planted and corn is a minor crop. The declines in barley and wheat acreage are partially explained by increases in hay area harvested and in CRP enrollment.
- In Idaho, the reduction in barley and wheat area is partially offset by increases in corn and hay area, but the CRP is not a significant factor.
- In Washington, an expansion of CRP area offsets part of the reduction in barley and wheat area, but the other crops considered are not a major factor. The decline in aggregate area planted and idled is larger than the decline in barley area.
- Minnesota soybean acreage and CRP enrollment increased, offsetting part of the decline in barley, wheat, and hay acreage.
- In South Dakota, barley, wheat, hay, other crop (primarily sunflower), and CRP area all declined, while there was a significant increase in soybean area and a smaller increase in corn plantings.
- For the rest of the country, barley, wheat, corn, and other crop area declined, while soybean, hay, and CRP land increased. The total amount of land devoted to nine major crops, hay, and the CRP declined by over 10 million acres.

Crop-reporting district (CRD) data for North Dakota, the number one barley state, show that different patterns can prevail within a given state (Table 2). The largest reduction in barley area between 1996-97 and 2004-05 (2006 CRD data are not available at this time) occurred in Northeast North Dakota, where declines in barley and wheat area were only partially offset by increases in soybeans, corn, and CRP area.

In contrast, in Southeast North Dakota, the decline in barley acreage was fairly modest, and the increases in corn, CRP, and especially soybean acreage far exceeded the decline in wheat acreage. Focusing on four major crops (barley, wheat, soybeans, and corn) and the CRP, total area declined in the three Northern crop reporting districts, but increased in the East Central and Southeast.

These observed changes in acreage are consistent with the following story: As new corn hybrids and soybean varieties suited to the region were developed, corn and soybeans displaced other crops, given better producer returns from corn and soybeans than from barley and wheat. In regions where corn and soybeans are not well suited, barley and wheat may have been displaced by other crops (e.g., canola in North Dakota) or land may have shifted to less intensive uses (e.g., CRP, fallow, and pasture) in response to weak producer returns.

Table 1. State and national change in land use, 2005-06 average vs. 1996-97 average

	Barley	Wheat	Soybeans	Corn	5 other*	Hay	CRP	Sum
	(thousand acres)							
North Dakota	-1,400	-3,368	2,375	815	203	-30	516	-889
Montana	-400	-1,075	0	5	-36	275	694	-537
Idaho	-165	-298	0	135	11	165	5	-147
Washington	-260	-450	0	-20	-20	-25	434	-341
Minnesota	-405	-830	800	50	-44	-240	215	-454
South Dakota	-85	-858	850	525	-333	-250	-211	-361
6-state total	-2,715	-6,878	4,025	1,510	-218	-105	1,652	-2,729
All other states	-500	-8,330	2,411	-331	-5,483	1,152	986	-10,094
U.S. total	-3,215	-15,208	6,436	1,180	-5,701	1,047	2,638	-12,823

* Canola, oats, sorghum, sugar beets, and sunflowers

Table 2. North Dakota change in land use, 2004-05 average vs. 1996-97 average

	Barley	Wheat	Soybeans	Corn	CRP	Sum
	(thousand acres)					
Northwest	-6	-597	27	12	-60	-624
North central	-166	-489	103	53	96	-403
Northeast	-579	-521	397	88	236	-379
West central	38	-179	10	24	-45	-152
Central	-65	-525	516	105	59	90
East central	-276	-557	683	220	144	215
Southwest	-15	85	0	24	-9	85
South central	-3	-150	17	45	-14	-105
Southeast	-55	-577	762	270	126	525
State total	-1,125	-3,510	2,350	840	533	-912

Producer returns

Estimates of national (Table 3) and regional (Table 4) producer returns are at least partially consistent with the story that producer returns explain much of the change in crop acreage. The tables compare average producer returns in the six years prior to adoption of the 1996 farm bill (1990/91-1995/96) to the most recent six years (2000/01-2005/06).

At the national level, increases in market prices and/or yields per acre increased per-acre market receipts for barley, corn, soybeans, and wheat. The proportional increase in barley market receipts is actually greater than that for the other crops. In the Northern Plains, a sharp increase in corn yields resulted in a larger proportional increase in corn market receipts per acre than for barley or the other crops.

It is difficult to obtain cost-of-production data that can be compared properly across time. USDA has production cost data going back to the 1970s, but accounting frameworks changed, making it hard to make “apple-to-apple” comparisons. Given some simplifying assumptions, FAPRI constructed national estimates of variable expenses per acre (variable expenses include things like seed, fuel, and fertilizer, but exclude land costs and machinery purchases). Barley variable production expenses were found to have increased proportionally more between the early 1990s and the early 2000s than did expenses for wheat, corn, and soybeans.

Early attempts to construct regional production cost estimates across time were abandoned, given major data inconsistencies (e.g., changes in regional definitions).

Subtracting variable expenses from market receipts results in estimates of per-acre market net returns over variable expenses. At the national level, the increase in barley market receipts more than offsets the increase in production expenses, so estimated barley net returns increase. For the other crops, the reverse is true and estimated market net returns per acre actually decline. These estimates do not seem consistent with observed changes in acreage, suggesting there is more to the story.

In making planting decisions, producers need to consider not only market net returns but also program benefits that are tied to production, such as marketing loan benefits. Marketing loan benefits were not available until 1993 for wheat, feed grains, and oilseeds, and only in the late 1990s did they become an important factor in producer income (the pre-1993 loan program at times provided important benefits to producers, but these were mostly reflected in higher market prices rather than in government payments). Between 2000/01 and 2005/06, national average annual marketing loan benefits ranged from less than \$4 per acre for wheat to about \$9 per acre for barley, \$14 for soybeans, and \$26 for corn.

Focusing on the Northern Plains (in FAPRI’s definition, North Dakota, South Dakota, Montana, and Wyoming), the average annual marketing loan benefit between 2000/01 and 2005/06 was \$4 per acre for wheat, \$8 for barley, \$12 for soybeans, and \$21 for corn.

Adding marketing loan benefits to market returns provides an estimate of returns that are clearly tied to crop production decisions. At the national level, marketing loan benefits are sufficiently large that estimated corn and soybean net returns (including marketing loan benefits) increased between the early 1990s and the early 2000s. Given smaller marketing loan benefits for wheat than other crops, estimated wheat net returns are less on average between 2000/01 and 2005/06 than they were between 1990/91 and 1995/96.

The national return data can help explain the observed increase in national soybean and corn acreage since the early 1990s and the decline in wheat acreage. However, they cannot explain the decline in barley acreage, as the national estimated barley net return actually increased proportionally more than the return to corn or soybeans.

Part of the story may be seen in the return estimates for the Northern Plains. Without reliable production cost data, only gross returns are reported, but they tell a slightly different story than the national figures. While barley market plus loan gross returns did increase between the early 1990s and the early 2000s, the absolute and proportional increases for corn were larger than for barley in the Northern Plains, and the soybean increase was only slightly smaller.

Furthermore, even at the regional level, the corn and soybean figures may be misleading. As corn and soybean area has expanded in the Northern Plains, the crops are now grown on land that previously would not have been considered suitable. While the average quality of land used to grow corn and soybeans is probably still higher than the quality of land used to produce wheat and barley, it is certainly true that the mix of land used for each crop has changed. Thus, it may be relevant to consider not just the change in returns since the early 1990s, but also the comparative level of returns for different crops (acknowledging that land quality differences mean the comparisons are not entirely “fair,” even at the regional level).

In the Northern Plains, the average per-acre gross return from corn and soybeans exceeds that for wheat and barley. Adjusting for differences in production costs and land quality probably offsets at least part of this apparent advantage for soybeans and especially for corn. However, reasonable estimates of production costs suggest that soybeans and corn are likely to be the preferred crops where there are no agronomic barriers.

Note that these comparisons of returns have excluded direct and countercyclical payments. These payments do provide income to producers with base acreage, but the level of payments in any given year is not affected by production decisions, with only minor exceptions. For example, on an operation with a given base acreage complement, direct and countercyclical payments will be exactly the same if the producer plants the entire farm to wheat, has a 50-50 crop mix between barley and wheat, or lets the entire farm lie fallow for a year. Because the payments are not contingent on current production decisions, direct and countercyclical payments seem unlikely to have major effects on a producer’s choice to plant one crop over another. In contrast, loan program benefits are only available on actual production, so they are likely to have larger impacts on production decisions.

Table 3. U.S. average producer returns per acre

	90-95 avg	00-05 avg	Change	% Change
U.S. market receipts	(dollars per acre)			
Barley	126.70	151.80	25.10	20%
Corn	288.74	298.82	10.08	3%
Soybeans	211.45	215.32	3.88	2%
Wheat	125.06	131.18	6.12	5%
U.S. variable expenses				
Barley	66.99	86.85	19.86	30%
Corn	146.10	166.66	20.55	14%
Soybeans	75.33	82.32	6.99	9%
Wheat	57.66	68.59	10.93	19%
U.S. market net returns				
Barley	59.71	64.95	5.24	9%
Corn	142.64	132.16	-10.47	-7%
Soybeans	136.11	133.00	-3.11	-2%
Wheat	67.40	62.59	-4.81	-7%
U.S. marketing loan benefits				
Barley	0.00	8.76	8.76	
Corn	0.01	25.89	25.88	
Soybeans	0.00	14.48	14.48	
Wheat	0.00	3.90	3.89	
U.S. market + loan net returns				
Barley	59.71	73.71	14.00	23%
Corn	142.64	158.05	15.40	11%
Soybeans	136.11	147.48	11.37	8%
Wheat	67.40	66.48	-0.92	-1%
U.S. area planted				
Barley	7.76	4.92	-2.84	-37%
Corn	75.51	79.24	3.73	5%
Soybeans	60.06	73.84	13.78	23%
Wheat	71.78	60.22	-11.56	-16%

Source: FAPRI calculations based on USDA data available in mid July 2006.

Table 4. Northern Plains average producer returns per acre

	90-95 avg	00-05 avg	Change	% Change
N. Plains market receipts				
	(dollars per acre)			
Barley	109.54	126.22	16.68	15%
Corn	183.05	217.01	33.96	19%
Soybeans	157.50	166.66	9.15	6%
Wheat	114.31	111.05	-3.26	-3%
N. Plains marketing loan benefits				
Barley	0.00	8.12	8.12	
Corn	0.00	20.96	20.96	
Soybeans	0.00	12.30	12.30	
Wheat	0.00	3.98	3.98	
N. Plains market + loan returns				
Barley	109.54	134.34	24.80	23%
Corn	183.05	237.97	54.92	30%
Soybeans	157.50	178.96	21.46	14%
Wheat	114.31	115.04	0.73	1%
N. Plains area planted				
Barley	4.61	2.90	-1.71	-37%
Corn	4.47	5.80	1.33	30%
Soybeans	2.84	7.00	4.17	147%
Wheat	20.76	17.85	-2.91	-14%

Source: FAPRI calculations based on USDA data available in mid July 2006. No regional production cost estimates are provided because of concerns about consistency of the data across time. The returns reported, therefore, are gross returns, in contrast to the net returns over variable costs reported in Table 3.

Barley supply and utilization

The U.S. barley supply and utilization table (Table 5) reveals a number of other developments in the market and in policy over the past decade. Starting at the top of the table:

- Barley base acreage far exceeds planted acreage. By 2005, barley planted acreage was less than half of barley base acreage. This implies that direct payments and countercyclical payments are being made on many acres that are not being used to produce barley in a given year.
- Barley food, seed, and industrial use declined between 1996/97 and 2001/02 and has been fairly stable since. This suggests declining-to-stable demand for malting barley, as brewing accounts for most of this category. Given steady population growth, the figures suggest that per-capita domestic brewing demand has been declining.
- Far larger than the decline in brewing use has been the decline in feed use. With reduced barley production and increasing local supplies of corn in barley-producing states, there is less incentive for livestock producers to use barley in feed rations.
- Between 1995/96 and 2005/06, the United States exported more barley than it imported in most years (the exceptions were 1996/97, 1998/99, and 2003/04). While U.S. net trade in barley varies from year to year, there is no distinct trend in the trade data since 1995/96 that can explain the reduction in U.S. production.
- Relative to the years covered by the 1996 farm bill (1996/97-2001/02), barley producers now receive a larger portion of their government support in a manner that would encourage barley production. In part because of an increase in loan rates, barley marketing loan benefits averaged less than \$7 per acre between 1996/97 and 2001/02, but almost \$9 per acre since 2002/03.
- Payments not tied to current production (production flexibility contract, market loss assistance, direct, and countercyclical payments) declined from almost \$17 per barley base acre between 1996/97 and 2001/02 to about \$12 per base acre between 2002/03 and 2005/06.

Table 5. U.S. barley supply and utilization, 1995/96-2005/06 marketing years

Marketing year	95/96	96/97	97/98	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06
Area	(million acres)										
Base area		10.53	10.54	11.20	11.30	11.50	11.50	8.79	8.71	8.70	8.70
Planted area	6.69	7.09	6.71	6.33	4.98	5.80	4.95	5.01	5.35	4.53	3.88
Harvested area	6.28	6.71	6.20	5.85	4.57	5.20	4.27	4.12	4.73	4.02	3.27
Yield	(bushels per acre)										
Actual	57.2	58.5	58.1	60.1	59.5	61.1	58.1	55.0	58.9	69.6	64.8
Program, DP/PFC		47.3	47.2	46.7	46.3	46.6	46.6	47.7	47.6	47.6	47.6
Program, CCP								48.7	48.7	48.7	48.7
Supply	(million bushels)										
Beginning stocks	513	529	510	501	441	458	379	337	368	412	345
Production	113	100	109	119	142	111	106	92	69	120	128
Imports	359	392	360	352	272	318	248	227	278	280	212
	41	37	40	30	28	29	24	18	21	12	5
Domestic use	351	389	316	330	302	294	260	238	229	261	210
Feed and residual	191	218	149	167	140	136	104	84	74	103	52
Food, seed, industrial	160	171	167	163	162	159	156	154	155	157	158
Exports	62	31	74	29	28	58	26	30	19	23	27
Total use	413	419	390	359	330	352	286	268	248	284	237
Ending stocks	100	109	119	142	111	106	92	69	120	128	108
CCC inventory	4	0	0	0	0	0	0	0	0	0	0
Under loan	3	15	19	12	6	4	4	2	7	1	2
Other stocks	92	95	100	129	105	102	89	68	114	127	106
Prices and returns	(dollars)										
All barley price/bu.	2.89	2.74	2.38	1.98	2.13	2.11	2.22	2.72	2.83	2.48	2.53
Feed barley price/bu.	2.68	2.52	2.05	1.54	1.63	1.70	1.72	2.16	2.29	1.73	1.92
Malting barley price/bu.			2.74			2.49	2.65	3.01	3.08	2.81	2.80
Loan rate/bu.	1.54	1.55	1.57	1.56	1.59	1.62	1.65	1.88	1.88	1.85	1.85
Average LDP rate/bu.	0.00	0.00	0.00	0.23	0.14	0.22	0.06	0.02	0.00	0.30	0.22
Target price/bu.								2.21	2.21	2.24	2.24
CCP rate/bu.								0.00	0.00	0.15	0.08
DP/PFC/MLA/bu.		0.33	0.28	0.43	0.54	0.52	0.43	0.24	0.24	0.24	0.24
Gross market revenue/a.	165.41	160.32	138.19	118.91	126.69	128.96	129.02	149.69	166.60	172.53	163.99
LDP revenue/a.	0.00	0.00	0.00	14.08	8.40	13.23	3.63	0.90	0.25	20.56	14.00
Variable expenses/a.	77.23	83.58	82.54	80.03	81.23	84.15	90.83	83.71	81.87	85.33	95.21
Mkt+LDP net returns/a.	88.18	76.74	55.65	52.96	53.85	58.04	41.82	66.89	84.98	107.76	82.78
CCP revenue/base a.								0.00	0.00	6.21	3.31
DP/PFC/MLA/base a.		13.35	11.11	16.88	21.33	20.69	16.91	9.73	9.71	9.71	9.71

Sources: USDA's July 2006 World Agricultural Supply and Demand Estimates, supplemented by other USDA data available in mid July 2006.

Abbreviations:

DP: direct payments
PFC: production flexibility contract payments
CCP: countercyclical payments
LDP: loan deficiency payments
MLA: market loss assistance payments

Policy Scenarios

Based on conversations with NBGA staff, FAPRI examined a baseline and three alternative policy scenarios:

1. The **baseline** continues current agricultural policies, including the loan rates, target prices, and direct payment rates established under the 2002 farm bill.
2. The **10% increase in barley loan rate** scenario increases the barley loan rate by 10% beginning with the 2008/09 crop, but keeps all other provisions of current law (including loan rates for other commodities).
3. The **no loan program** scenario eliminates the marketing loan program for barley and all other program crops. Target prices and direct payment rates are maintained at baseline levels.
4. The **no loan, increase in direct payments** scenario also eliminates the loan program for all program crops, and it increases direct payment rates so that the combined changes are budget neutral for each crop over the period between fiscal year 2008 and fiscal year 2012.

These assumptions are summarized in Table 6. The point of comparison for the analysis is FAPRI's stochastic baseline prepared in early 2006. Each year, FAPRI prepares a baseline outlook for the U.S. and world agricultural economy, assuming a continuation of current agricultural policies, trend rates of technological growth, average weather conditions, and a macro-economy that evolves as forecast by Global Insight, a private economic forecasting group. The "standard" global FAPRI baseline thus gives point estimates of market outcomes under one particular set of assumptions.

Recognizing that actual weather, supply, and demand conditions will never be exactly as assumed, FAPRI also estimates 500 alternative baseline outlooks. These 500 alternative outlooks (referred to here as the stochastic baseline) share the common assumption that current agricultural policies will remain in place, but differ from one another in their assumptions about crop yields, export demand, production costs, and a variety of other supply and demand factors.

The remaining tables report average results over the 500 stochastic outcomes. Sometimes these averages can mask differences in how the assumed policy changes affect markets under different conditions. For example, a change in loan rates may have little or no impact on markets if prices would otherwise have been well above levels that generate loan deficiency payments or marketing loan gains (for example, a feed barley price of \$2.50 per bushel). On the other hand, a change in loan rates may have large market impacts if a large crop or weak demand result in market prices below existing loan rates (for example, a feed barley price of \$1.50 per bushel). The average impact across 500 stochastic outcomes would therefore be an average of many outcomes where the effect is zero and a number of outcomes where the effect might be large.

Table 6. Policy assumptions

	Baseline level	10% increase in barley loan rate	No loan program	No loan, increase in direct payments
Barley	(Dollars per bushel)			
Loan rate	1.85	2.04	0.00	0.00
Direct payment rate	0.24	0.24	0.24	0.31
Target price	2.24	2.24	2.24	2.24
Corn				
Loan rate	1.95	1.95	0.00	0.00
Direct payment rate	0.28	0.28	0.28	0.42
Target price	2.63	2.63	2.63	2.63
Soybeans				
Loan rate	5.00	5.00	0.00	0.00
Direct payment rate	0.44	0.44	0.44	1.11
Target price	5.80	5.80	5.80	5.80
Wheat				
Loan rate	2.75	2.75	0.00	0.00
Direct payment rate	0.52	0.52	0.52	0.61
Target price	3.92	3.92	3.92	3.92
Upland cotton	(Cents per pound)			
Loan rate	52.00	52.00	0.00	0.00
Direct payment rate	6.67	6.67	6.67	23.54
Target price	72.40	72.40	72.40	72.40
Rice	(Dollars per hundredweight)			
Loan rate	6.50	6.50	0.00	0.00
Direct payment rate	2.35	2.35	2.35	4.22
Target price	10.50	10.50	10.50	10.50

Stochastic analysis was important in determining the assumptions for the **no loan, increase in direct payments** scenario. The objective was to find the increase in direct payment rates for each commodity that, in conjunction with the elimination of the marketing loan program, would leave overall net budgetary expenditures on each commodity unchanged from the **baseline** level over fiscal years 2008-2012. The direct payment rates reported in Table 6 are those that achieve this objective on average over the 500 stochastic outcomes.

The adjustments in direct payment rates are much larger for some crops than for others, primarily because average marketing loan benefits are much larger in the **baseline** for commodities like upland cotton, rice, and soybeans than they are for commodities like barley and wheat.

Baseline outlook for U.S. barley markets

The **baseline** outlook for the barley market under the assumption that current policies will remain in place is reported in Table 7. Given all the assumptions of the baseline, projected barley acreage declines slowly over time, offsetting an increase in barley yields, and leaving barley production fairly stable. In any given year, of course, yields will differ from the average. Domestic use continues to decline slowly, and the United States continues to be a small net exporter of barley on average. All barley farm prices average a bit more than \$2.70 per bushel from 2008/09 onwards, and feed barley prices increase over time, partly in response to projected increases in corn prices.

Note that the **baseline** was prepared in early 2006, and overestimates actual 2006 barley acreage by about 400,000 acres. All else equal, the result will be less barley production than indicated in 2006, as well as increased imports, higher market prices, and reduced domestic consumption, exports, and stocks. A lower acreage figure for 2006 brings into question the projected path for barley acreage, which may be unrealistically high.

In July 2006, FAPRI prepared a 5-year update of the outlook for U.S. commodity markets. The published version of the update did not include supply and use figures for barley. The unpublished estimates suggest less barley area, domestic use, and exports than in the early 2006 **baseline**, with a modest increase in imports and market prices. The updated outlook is not used for the present analysis because no new stochastic baseline has been prepared, and many of the questions examined here can only properly be examined using stochastic analysis. An updated baseline would have resulted in different quantitative estimates for the impacts of policy changes, but for the most part the directional impacts would likely have been the same.

Remaining tables report averages over a five-year period that may be covered by the next farm bill (2008/09-2012/13). Results for individual years are available upon request.

Table 7. U.S. barley supply and utilization under current policies (baseline)*

Marketing year	06/07	07/08	08/09	09/10	10/11	11/12	12/13
Area	(thousand acres)						
Planted area	3,891	3,857	3,826	3,812	3,735	3,679	3,610
Harvested area	3,417	3,396	3,363	3,348	3,291	3,239	3,179
Yield	(bushels per acre)						
	63.6	64.1	64.6	65.3	65.9	66.5	67.0
Supply and use	(million bushels)						
Production	218	218	218	219	217	216	213
Imports	11	10	9	8	8	7	8
Domestic use	207	204	199	196	193	190	188
Exports	30	30	30	32	32	33	33
Ending stocks	101	94	93	93	92	92	92
Prices and returns	(dollars)						
All barley farm price/bu.	2.61	2.66	2.72	2.74	2.75	2.75	2.74
Feed barley price/bu.	1.96	2.02	2.09	2.13	2.16	2.18	2.17

* Average results from FAPRI stochastic baseline prepared in early 2006. USDA June *Acreage* report estimates actual 2006 planted area was 3.496 million acres. The August *World Agricultural Supply and Demand Estimates* indicate 2006 production of 183 million bushels and a projected average 2006/07 farm price of \$2.45-\$2.85 per bushel.

Scenario impacts on barley supply and use

The **10% increase in barley loan rate** scenario increases the barley loan rate from the current \$1.85 per bushel to \$2.035 per bushel. The scenario maintains the current target price of \$2.24 per bushel and the current direct payment rate of \$0.24 per bushel. Because countercyclical payments can only occur if the greater of the loan rate or the season-average market price for feed barley (at least the \$2.035 loan rate) is less than the target price minus the direct payment rate ($\$2.24 - \$0.20 = \$2.00$ per bushel), the scenario precludes the possibility of countercyclical payments for barley producers.

The scenario increases average returns that are tied to the production of barley, so it results in an increase in average barley acreage planted (Table 8). The increase is a relatively modest 77,000 acres (2.1%) on average. The resulting increase in barley production results in slightly greater barley exports, domestic use, and stocks, and marginally lower barley prices. The absolute increase in barley domestic use (primarily an increase in feed use) is larger than the absolute increase in barley exports, but the proportional increase in barley exports is larger.

The **no loan program** scenario eliminates the loan program for barley and all other crops. Potential countercyclical payments increase, as they are no longer capped by the current \$0.15 difference between the target price minus the direct payment rate on the one hand and the loan rate on the other.

The elimination of the loan program causes acreage shifts across a variety of commodities. For barley, the effect of lower loan program benefits dominates offsetting impacts on other crops, resulting in a slight (29,000 acres, or 0.8%) reduction in barley planted area. The small reduction in production results in marginal reductions in barley domestic use, exports, and ending stocks, and a tiny increase in barley market prices.

The **no loan, increase in direct payments** scenario has very similar impacts on barley supply and use as the **no loan program** scenario. The \$0.07 increase in direct payment rates has only a marginal impact on barley production, as the direct payments do not depend on production decisions. Further, the increase in direct payment rates has an offsetting impact on countercyclical payments. In the **baseline** and the **no loan program** scenario, direct payments are available when season-average market prices for feed barley are less than \$2.00 per bushel. The increase in direct payment rates means that countercyclical payments are only available when season-average market prices for feed barley dip below \$1.93 per bushel (the \$2.24 target price minus the new \$0.31 direct payment rate).

Barley area planted in the **no loan, increase in direct payments** scenario is 19,000 acres (0.5%) less than in the **baseline**, but 10,000 acres (0.3%) more than in the **no loan program** scenario. Changes from baseline in production, consumption, and prices are all smaller than in the **no loan program** scenario.

Table 8. 5-year average impacts of policy alternatives on barley supply and utilization

	Baseline level	Absolute change from baseline			Percentage change from baseline		
		10% increase in barley loan rate	No loan program	No loan, increase in direct payments	10% increase in barley loan rate	No loan program	No loan, increase in direct payments
Area		(thousand acres)					
Planted area	3,733	77	-29	-19	2.1%	-0.8%	-0.5%
Harvested area	3,284	68	-26	-17	2.1%	-0.8%	-0.5%
Yield	65.9	(bushels per acre)					
		0.0	0.0	0.0	0.0%	0.0%	0.0%
Supply and use		(million bushels)					
Production	217	4.5	-1.7	-1.1	2.1%	-0.8%	-0.5%
Imports	8	0.0	0.0	0.0	0.0%	0.0%	0.0%
Domestic use	193	2.8	-1.1	-0.6	1.5%	-0.6%	-0.3%
Exports	32	1.4	-0.5	-0.4	4.4%	-1.7%	-1.4%
Ending stocks	92	0.9	-0.5	-0.3	1.0%	-0.6%	-0.4%
Prices and returns		(dollars)					
All barley farm price/bu.	2.74	-0.020	0.007	0.003	-0.7%	0.3%	0.1%
Feed barley price/bu.	2.15	-0.008	0.003	0.000	-0.4%	0.1%	0.0%

Notes: The table reports averages over 500 stochastic outcomes for the 2008/09-2012/13 marketing years.

Baseline: FAPRI baseline prepared in early 2006. Assumes a continuation of 2002 farm bill policies

10% increase in barley loan rate: Increases barley loan rate by 10% beginning in 2008/09, but makes no other policy changes

No loan program: Eliminates the marketing loan program for barley and all other grains, oilseeds, and cotton

No loan, increase in direct payments: Same as above, except direct payment rates are increased so that net budgetary expenditures for each crop over fiscal years 2008-2012 are at baseline levels.

Barley producer returns

In the **baseline**, average barley producer returns from marketing barley (the all-barley farm price multiplied by the yield per acre) average about \$180 per acre over the 2008/09-2012/13 marketing years (Table 9). Average loan program benefits (loan deficiency payments or marketing loan gains) are estimated to be about \$5 per acre. Variable production expenses (expenses for fuel, fertilizer, seed, etc., but excluding land, machinery purchase, and other fixed expenses) average about \$101 per acre. Subtracting the variable expenses from the sum of market receipts and loan program benefits results in an average net return tied to production of \$84 per acre.

Direct and countercyclical payments are tied to program bases and yields, not to actual production. In the baseline, direct payments average almost \$10 per barley base acre and countercyclical payments average a little over \$1 per acre. For the rare producer who has exactly one barley base acre for each acre planted to barley, this would imply a net return including all payments of about \$95 per acre. Note that barley base acreage is more than double planted acreage, suggesting many producers would get proportionally more of their income from direct and countercyclical payments than under this example assuming a one-to-one correspondence between barley base acreage and planted acreage.

The **10% increase in barley loan rate** scenario increases average barley loan program benefits by \$6.53 per acre. This effect is partially offset by lower barley prices and market returns, leaving net returns from the market and loan program up by \$5.25 per acre from baseline levels. Because the scenario would eliminate barley countercyclical payments, the net effect on net returns including all payments would be smaller, an increase of \$3.91 per base acre planted to barley. This relatively modest average impact would mask stochastic outcomes where the effects are much larger (those with low baseline barley prices) and those where the effects would be negligible (those outcomes where baseline barley prices are well above the loan rate).

The **no loan program** scenario eliminates the \$4.99 per acre loan program benefits in the baseline. Partially offsetting this is a slight increase in prices and market returns, and a small increase in average countercyclical payments. Net returns tied to production (market plus loan program) decline relative to the baseline by \$4.53 per acre, and net returns including all payments per base acre planted to barley decline by \$4.00 per acre.

The **no loan, increase in direct payments** scenario has similar effects on producer returns as the **no loan program** scenario, except direct payments are increased by \$2.67 per base acre. That would leave net returns including all payments down by \$2.32 per base acre planted to barley, as the decline in loan program benefits (and countercyclical payments) more than offsets the small increases in market returns and direct payments. Note, however, that this result hinges on the assumption that one acre of barley base corresponds to one acre of barley planted area. Suppose a producer has twice as much barley base as planted area. For such a producer, the increase in direct payments would be sufficient to fully compensate the producer for the loss of loan program benefits.

Table 9. 5-year average impacts of policy alternatives on barley producer returns

	Baseline level	Absolute change from baseline			Percentage change from baseline		
		10% increase in barley loan rate	No loan, increase in direct payments	No loan, increase in direct payments	10% increase in barley loan rate	No loan, increase in direct payments	No loan, increase in direct payments
		(dollars per acre)					
Market value of production	179.75	-1.29	0.46	0.17	-0.7%	0.3%	0.1%
- Variable production costs	100.74	0.00	0.00	0.00	0.0%	0.0%	0.0%
= Market net returns	79.02	-1.29	0.46	0.17	-1.6%	0.6%	0.2%
+ Loan program benefits	4.99	6.53	-4.99	-4.99	131.1%	-100.0%	-100.0%
= Market + loan net returns	84.00	5.25	-4.53	-4.82	6.2%	-5.4%	-5.7%
		(dollars per base acre)					
+ Countercyclical payment	1.33	-1.33	0.53	-0.17	-100.0%	39.9%	-12.9%
+ Direct payment	9.71	0.00	0.00	2.67	0.0%	0.0%	27.5%
		(dollars per base acre planted to barley)					
= Net returns w/ payments	95.05	3.91	-4.00	-2.32	4.1%	-4.2%	-2.4%

Notes: The table reports averages over 500 stochastic outcomes for the 2008/09-2012/13 marketing years. Net returns with payments are reported on the basis of dollars per barley base acre that is planted to barley. For any given producer, barley planted area is unlikely to be the same as barley base area. U.S. barley base area is approximately 8.7 million acres, more than double barley planted area.

Baseline: FAPRI baseline prepared in early 2006. Assumes a continuation of 2002 farm bill policies

10% increase in barley loan rate: Increases barley loan rate by 10% beginning in 2008/09, but makes no other policy changes

No loan program: Eliminates the marketing loan program for barley and all other grains, oilseeds, and cotton

No loan, increase in direct payments: Same as above, except direct payment rates are increased so that net budgetary expenditures for each crop over fiscal years 2008-2012 are at baseline levels.

Returns to producers of other crops

In the **baseline**, commodities differ significantly in their reliance on different types of payments (Table 10). Average loan program benefits, for example range from just \$1.31 per acre for wheat to \$46.64 per acre for upland cotton. In contrast, direct payments are a larger share of total income for wheat producers than for producers of other crops. Countercyclical payments are a relatively minor factor for wheat and soybeans, but are quite important for cotton. These estimates are all contingent on estimates of baseline market prices, as higher prices reduce the importance of countercyclical payments and loan program benefits.

The **10% increase in barley loan rate** scenario has only marginal impacts on crops other than barley.

The **no loan program** scenario, in contrast, has profound impacts on producer returns. Eliminating the baseline \$8.74 per acre in average corn loan program benefits would translate into an average reduction in returns including all payments of \$7.76 per base acre of corn planted to corn. For wheat, the lost loan program benefits are much smaller, so the decline in returns per base acre of wheat planted to wheat is just \$1.55.

Soybean loan program benefits averaged \$12.10 per acre in the baseline, but eliminating the loan program would increase soybean countercyclical payments in many of the stochastic outcomes, leaving average returns per base acre of soybeans planted to soybeans down by \$5.98, about half the decline in loan program benefits. In the case of upland cotton, the elimination of loan program benefits would be offset both by an increase in countercyclical payments and by an increase in market receipts. Net returns per base acre of cotton planted to cotton are \$27.99 less than in the baseline, but this is a much smaller net impact than the loss of \$46.64 per acre in loan program benefits might have suggested.

The **no loan, increase in direct payments** scenario has similar impacts on market and loan net returns relative to the **no loan program** scenario. Countercyclical payments are reduced relative to the **baseline** and relative to the **no loan program** scenario, given payment formulas (countercyclical payments are made only when the market price is less than the target price minus the direct payment rate; increasing direct payment rates therefore has the effect of reducing countercyclical payments if there is no change in target prices).

For all four crops reported in Table 10, the increase in direct payments is comparable to the loss in other returns. Because the changes in direct payment rates were selected so as to be budget neutral relative to the baseline, this result should not be surprising. As with barley, it is important to note that there is not a one-to-one correspondence between base acreage and planted acreage. For wheat, upland cotton, and corn, base acreage exceeds planted acreage, and the opposite is true for soybeans. The more base acreage a producer has relative to planted acreage, the more likely it is that the **no loan, increase in direct payments** scenario will increase net returns including all payments.

Table 10. 5-year average impacts of policy alternatives on producer returns for major crops

		Absolute change from baseline			Percentage change from baseline		
	Baseline level	10% increase in barley loan rate	No loan program	No loan, increase in direct payments	10% increase in barley loan rate	No loan program	No loan, increase in direct payments
Corn							
		(dollars per acre)					
Market value of production	369.25	-0.03	-0.10	-0.51	0.0%	0.0%	-0.1%
- Variable production costs	203.13	0.00	0.00	0.00	0.0%	0.0%	0.0%
= Market net returns	166.11	-0.03	-0.10	-0.51	0.0%	-0.1%	-0.3%
+ Loan program benefits	8.74	0.01	-8.74	-8.74	0.1%	-100.0%	-100.0%
= Market + loan net returns	174.86	-0.02	-8.85	-9.26	0.0%	-5.1%	-5.3%
		(dollars per corn base acre)					
+ Countercyclical payment	10.08	0.01	1.09	-4.43	0.1%	10.8%	-43.9%
+ Direct payment	24.37	0.00	0.00	12.55	0.0%	0.0%	51.5%
		(dollars per corn base acre planted to corn)					
= Net returns w/ payments	209.31	-0.02	-7.76	-1.13	0.0%	-3.7%	-0.5%
Soybeans							
		(dollars per acre)					
Market value of production	229.31	0.02	0.52	0.37	0.0%	0.2%	0.2%
- Variable production costs	104.97	0.00	0.00	0.00	0.0%	0.0%	0.0%
= Market net returns	124.35	0.02	0.52	0.37	0.0%	0.4%	0.3%
+ Loan program benefits	12.10	-0.01	-12.10	-12.10	-0.1%	-100.0%	-100.0%
= Market + loan net returns	136.44	0.01	-11.57	-11.73	0.0%	-8.5%	-8.6%
		(dollars per soybean base acre)					
+ Countercyclical payment	4.21	0.00	5.59	-1.06	0.0%	132.6%	-25.2%
+ Direct payment	11.52	0.00	0.00	17.55	0.0%	0.0%	152.3%
		(dollars per soybean base acre planted to soybeans)					
= Net returns w/ payments	152.18	0.00	-5.98	4.76	0.0%	-3.9%	3.1%
Wheat							
		(dollars per acre)					
Market value of production	153.77	-0.02	-0.48	-0.82	0.0%	-0.3%	-0.5%
- Variable production costs	86.47	0.00	0.00	0.00	0.0%	0.0%	0.0%
= Market net returns	67.29	-0.02	-0.48	-0.82	0.0%	-0.7%	-1.2%
+ Loan program benefits	1.31	0.00	-1.31	-1.31	0.1%	-100.0%	-100.0%
= Market + loan net returns	68.60	-0.02	-1.79	-2.13	0.0%	-2.6%	-3.1%
		(dollars per wheat base acre)					
+ Countercyclical payment	2.75	0.00	0.24	-0.49	0.1%	8.8%	-17.9%
+ Direct payment	15.25	0.00	0.00	2.51	0.0%	0.0%	16.4%
		(dollars per wheat base acre planted to wheat)					
= Net returns w/ payments	86.60	-0.01	-1.55	-0.12	0.0%	-1.8%	-0.1%
Upland cotton							
		(dollars per acre)					
Market value of production	466.26	0.00	8.29	11.62	0.0%	1.8%	2.5%
- Variable production costs	368.62	0.00	0.00	0.00	0.0%	0.0%	0.0%
= Market net returns	97.64	0.00	8.29	11.62	0.0%	8.5%	11.9%
+ Loan program benefits	46.64	0.00	-46.64	-46.64	0.0%	-100.0%	-100.0%
= Market + loan net returns	144.28	0.00	-38.36	-35.02	0.0%	-26.6%	-24.3%
		(dollars per cotton base acre)					
+ Countercyclical payment	61.16	0.00	10.36	-55.40	0.0%	16.9%	-90.6%
+ Direct payment	34.23	0.00	0.00	86.54	0.0%	0.0%	252.9%
		(dollars per cotton base acre planted to cotton)					
= Net returns w/ payments	239.67	0.00	-27.99	-3.87	0.0%	-11.7%	-1.6%

Notes: The table reports averages over 500 stochastic outcomes for the 2008/09-2012/13 marketing years. Note that base acreage may be very different than planted acreage for individual producers. Base acreage for corn, wheat, and upland cotton exceeds planted area for the nation as a whole, and soybean base acreage is less than soybean planted area.

Crop acreage

In the **baseline**, an average of just over 250 million acres is planted to 12 major crops (Table 11). An additional 62.5 million acres of hay are harvested each year.

In the **10% increase in barley loan rate** scenario, the 77,000 acre average increase in barley planted area is largely offset by reductions in acreage for most other crops. The largest absolute reduction is in wheat acreage, which declines by 21,000 acres from baseline levels. The sum of the declines in acreage for other crops is slightly less than the increase in barley acreage, suggesting a slight (26,000 acre) reduction in fallow and other uses of land.

The **no loan program** scenario results in much larger acreage shifts. In general, the commodities most dependent on marketing loan benefits in the baseline are the most affected, with upland cotton acreage and rice area each declining by about 5%. Acreage actually increases for wheat and sorghum, as producers shift area away from cotton and other crops. For 12 major crops and hay, overall acreage declines by an average of 583,000 acres, or 0.2%. Experience suggests that the total amount of land planted to major crops can vary based on growing conditions and economic incentives, but the changes tend not to be very large.

The **no loan, increase in direct payments** scenario yields results similar to those under the **no loan program** scenario. For several crops and for the total of 12 major crops, acreage is marginally greater than in the **no loan program** scenario, as the increase in direct payments keeps at least some land in production that might otherwise have shifted to other uses. Even though total government spending by commodity is about the same as in the **baseline**, acreage still declines for the crops most dependent on marketing loans in the baseline (cotton and rice), and the total acreage devoted to all major crops is less than in the baseline. By replacing payments that are very “coupled” to production decisions (loan program benefits) with payments that are largely “decoupled” from production decisions (direct payments), producers have less incentive to keep marginal land in production just to capture program benefits.

Comparison of the **no loan program** and **no loan program, increase in direct payments** scenarios does reveal one anomaly: estimated acreage for cotton and rice is actually less in the scenario with increased direct payments. In the model used to estimate these results, direct payments are assumed to have a smaller positive impact on acreage than countercyclical payments have. Because an increase in direct payments has the effect of sharply reducing (eliminating under most market conditions) countercyclical payments for cotton and rice, the model estimates that the net effect would be a further reduction in cotton and rice acreage. While explainable, this particular result may be subject to question, given the increase in overall returns to cotton and rice relative to the **no loan program** scenario. The principal results of the analysis do seem more defensible: the increase in direct payments does much more to provide producers with base acreage additional income than it does to change crop production decisions.

Table 11. 5-year average impacts of policy alternatives on crop acreage

	Baseline level	Absolute change from baseline			Percentage change from baseline		
		10% increase in barley loan rate	No loan program	No loan, increase in direct payments	10% increase in barley loan rate	No loan program	No loan, increase in direct payments
Planted area		(thousand acres)					
Barley	3,733	77	-29	-19	2.1%	-0.8%	-0.5%
Corn	84,409	-6	-94	-71	0.0%	-0.1%	-0.1%
Soybeans	70,949	-2	-102	-62	0.0%	-0.1%	-0.1%
Wheat	57,279	-21	382	603	0.0%	0.7%	1.1%
Upland cotton	14,076	0	-672	-942	0.0%	-4.8%	-6.7%
Sorghum	6,299	-5	34	111	-0.1%	0.5%	1.8%
Oats	4,153	-8	26	45	-0.2%	0.6%	1.1%
Rice	3,257	0	-170	-182	0.0%	-5.2%	-5.6%
Sunflowers	2,444	-6	-3	4	-0.2%	-0.1%	0.2%
Peanuts	1,547	0	-15	-28	0.0%	-1.0%	-1.8%
Sugar beets	1,295	-2	3	4	-0.1%	0.2%	0.3%
Sugar cane (harvested)	882	1	3	4	0.1%	0.3%	0.4%
12 crop planted area	250,321	28	-638	-534	0.0%	-0.3%	-0.2%
Hay harvested area	62,536	-3	55	45	0.0%	0.1%	0.1%
12 crops + hay	312,857	26	-583	-489	0.0%	-0.2%	-0.2%

Notes: The table reports averages over 500 stochastic outcomes for the 2008/09-2012/13 marketing years.

Baseline: FAPRI baseline prepared in early 2006. Assumes a continuation of 2002 farm bill policies

10% increase in barley loan rate: Increases barley loan rate by 10% beginning in 2008/09, but makes no other policy changes

No loan program: Eliminates the marketing loan program for barley and all other grains, oilseeds, and cotton

No loan, increase in direct payments: Same as above, except direct payment rates are increased so that net budgetary expenditures for each crop over fiscal years 2008-2012 are at baseline levels.

Government outlays

In the **baseline**, net outlays by the Commodity Credit Corporation (CCC) total \$81 billion over the period from fiscal year 2008 to fiscal year 2012 (Table 12). Of that total, estimated net outlays on barley total \$579 million, and spending on other grains, oilseeds, and cotton total \$56 billion. Other expenditures (on the conservation reserve, dairy, tobacco, sugar, and other programs) total \$24 billion.

The **10% increase in barley loan rate** scenario would increase barley outlays by a total of \$57 million (9.8%) over fiscal years 2008-2012. Net effects on spending on other crops are minimal.

The **no loan program** scenario would reduce spending overall net CCC outlays by \$11.5 billion, with barley accounting for just \$72 million of the total savings.

The **no loan, increase in direct payments** scenario would, by construction, leave net outlays for barley and other program crops essentially unchanged from baseline levels. Table 12 indicates that the scenario would nevertheless reduce net CCC outlays by about \$1.4 billion over fiscal years 2008-2012. This seeming contradiction can be explained by an accounting quirk. By eliminating the loan program, FAPRI estimates that net CCC interest payments on borrowings from the Treasury could be reduced. These interest savings are not allocated to particular crops, given current CCC accounting conventions.

In general, readers should be reminded that the reported estimates of CCC outlay changes are FAPRI estimates based on an early 2006 baseline. Estimated outlay changes would be different if evaluated against a different baseline, and estimates by the Congressional Budget Office or the Office of Management and Budget are likely to differ from these estimates for both baseline and model reasons.

World Trade Organization rules

During the recently suspended negotiations on a new World Trade Organization agreement, several parties proposed to put in place commodity-specific limits on certain types of (“amber box”) support provided to producers. Alternative proposals would have limited such commodity-specific support to either the 1999-2001 average level (\$42 million in the case of barley) or the 1995-2000 average (\$33 million for barley).

Expenditures under the marketing loan program would presumably count toward these proposed limits. Under **baseline** policies, approximately 14% of stochastic outcomes in a given year would exceed the higher limit, and 20% would exceed the lower limit. The **10% increase in barley loan rate** scenario would increase those proportions exceeding the hypothetical limits to 38% and 45%, respectively. In other words, increasing barley loan rates significantly increases the probability that discussed limits on support to barley producers would be exceeded. Eliminating the loan program under either of the two other scenarios would eliminate any chance of exceeding the proposed caps.

Table 12. 5-year total impacts of policy alternatives on net outlays by the Commodity Credit Corporation

	Baseline level	Absolute change from baseline			Percentage change from baseline		
		10% increase in barley loan rate	No loan program	No loan, increase in direct payments	10% increase in barley loan rate	No loan program	No loan, increase in direct payments
		(million dollars)					
Barley	579	57	-72	-1	9.8%	-12.4%	-0.1%
Other grains, oilseeds, cotton	56,210	0	-10,105	-10	0.0%	-18.0%	0.0%
All other	24,205	-1	-1,363	-1,354	0.0%	-5.6%	-5.6%
Net CCC outlays	80,994	56	-11,539	-1,364	0.1%	-14.2%	-1.7%

Notes: The table reports averages over 500 stochastic outcomes for total outlays over fiscal years 2008-2012. The changes in the "all other" category mostly represent changes in net interest costs, which are reduced when the loan program is eliminated.

Baseline: FAPRI baseline prepared in early 2006. Assumes a continuation of 2002 farm bill policies

10% increase in barley loan rate: Increases barley loan rate by 10% beginning in 2008/09, but makes no other policy changes

No loan program: Eliminates the marketing loan program for barley and all other grains, oilseeds, and cotton

No loan, increase in direct payments: Same as above, except direct payment rates are increased so that net budgetary expenditures for each crop over fiscal years 2008-2012 are at baseline levels.

Table 13. 5-year average proportion of stochastic outcomes exceeding hypothetical World Trade Organization limits on product-specific amber box support for barley

	Baseline level	10% increase in barley loan rate	No loan program	No loan, increase in direct payments
Hypothetical limit set equal to:				
100% of 1999-2001 average (\$42 million)	13.9%	38.2%	0.0%	0.0%
100% of 1995-2000 average (\$33 million)	19.7%	45.2%	0.0%	0.0%

Notes: The table reports the annual average percentage of outcomes exceeding the hypothetical limits over the 2008/09-2012/13 marketing years

Concluding Comments

U.S. barley acreage has declined for a variety of reasons, including producer returns that are not competitive with other crops. No recovery in barley production is projected under a continuation of current policies.

The analysis examined three possible changes in policy that would affect barley producers. The first would increase loan rates for barley by 10%. This policy change would increase returns tied to the production of barley, so it would have a modest positive effect on barley acreage. Barley producer income would be increased, at least in years that would otherwise experience low returns because of low barley prices. The increase in barley loan rates would increase government spending and might have WTO implications.

Eliminating the loan program would reduce production of barley and several other crops. The largest negative effects would be felt by producers of commodities that are most dependent on marketing loan benefits under current programs. Acreage could actually increase slightly for wheat and other crops that are not very reliant on loan program benefits, as producers shift acreage away from crops like cotton where average marketing loan benefits are expected to be larger.

Producers could be compensated for the elimination of the loan program by an increase in direct payments. Such a policy change would provide more stability in government payments and would be most likely to benefit producers who have a large amount of base acreage relative to actual crop production. However, such a change would also provide producers less support when prices are low than under current law, and would be less likely to benefit producers who have limited base acreage relative to the amount of land they use for crop production.

Most of the tables presented in the paper show five-year averages for sake of conciseness. Each of the numbers reported is an average of 2500 other numbers (500 outcomes for each of five years). Detailed tables providing annual averages can be provided upon request, and the stochastic outcomes can be sorted various ways to examine how the policies examined perform under different market circumstances.

The paper examines only a few selected issues related to the barley sector, and the three policy options examined are only a subset of the policy alternatives that may be discussed during debate on new farm legislation. FAPRI expects to examine a wide variety of other policy issues as the debate unfolds.

Appendix

Congressional letter of request follows

Congress of the United States
Washington, DC 20515

March 22, 2006

Dr. Abner Womack
Co-Director
Food and Agricultural Policy Research Institute
Department of Agricultural Economics
University of Missouri - Columbia
101 S. Fifth Street
Columbia, MO 65201

Dear Dr. Womack:

We write to request the assistance of the Food and Agricultural Policy Research Institute (FAPRI) in providing analysis of the U.S. barley industry in preparation for Congress' work on the next farm bill. Specifically, we request an assessment of the following questions proposed by the National Barley Growers Association:

- What specific provisions and to what extent are the various components of the 2002 Farm Bill contributing to the decline in the planted acreage of barley in the U.S.?
- What modifications to the current U.S. barley program could be made in future agriculture policy to reverse this trend and put barley in a more equitable position relative to other program crops?

Please feel free to contact any of our offices, or the National Barley Growers Association, should you have any questions. We look forward to receiving your findings.

Sincerely,



Mike Crapo
United States Senator



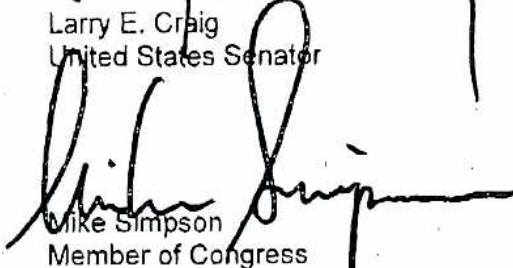
Kent Conrad
United States Senator



Larry E. Craig
United States Senator



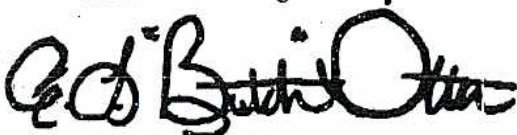
Byron L. Dorgan
United States Senator



Mike Simpson
Member of Congress



Earl Pomeroy
Member of Congress



C.L. "Butch" Otter
Member of Congress