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1993 Iowa Agricultural Disaster Preliminary Estimates

Abstract

On July 27, 1993 a multidisciplinary committee was formed at Iowa State University to provide preliminary estimates for the economic effects of the 1993 floods on Iowa's agricultural enterprises. This report summarizes the committee's initial estimates of the losses by broad economic category; detailed income information was not available at the time the report was written. The report does not provide estimates of lost income due to agribusiness work stoppages nor direct losses of livestock, buildings, fences, and machinery.

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This is the first in a series of *CARD Briefing Papers* that will analyze a variety of issues of interest to agriculture. These analyses are based on the latest CARD and FAPRI baselines, and include topics such as the 1993 flood damage, agricultural policies and projections, FAPRI baseline summaries, CRP analysis for Iowa, and a wide range of international policy issues with implications for agriculture.

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1993 IOWA AGRICULTURAL DISASTER PRELIMINARY ESTIMATES

On July 27, 1993 a multidisciplinary committee was formed at Iowa State University to provide preliminary estimates of the economic effects of the 1993 floods on Iowa's agricultural enterprises. This report summarizes the committee's initial estimates of the losses by broad economic category; detailed income information was not available at the time the report was written. The report does not provide estimates of lost income due to agribusiness work stoppages nor direct losses of livestock, buildings, fences, and machinery.

Agriculture is a very important component of the state's economy, and Iowa plays an integral role in the nation's farm economy. In 1991, receipts from Iowa's 102,000 farms totaled \$10.18 billion. Net farm income totaled \$2.29 billion. Iowa ranks among the top states nationally in the production of several commodities, including corn, soybeans, hogs, beef cattle, and dairy products. Approximately 56 percent of total cash receipts are derived from livestock and 44 percent from crops.

Flooding of the Mississippi, Des Moines, Raccoon, Missouri, Nishnabotna, Iowa, Cedar and Skunk rivers, many other tributaries, and extensive ponding across the state have caused significant damage to Iowa's agricultural sector. Although it is premature to make conclusive estimates, extensive damage has been done to crops, livestock, equipment, machinery, buildings, and agribusinesses. In addition, it is too early in the growing season to accurately quantify the condition of crops not affected by the flooding. This analysis assumes reduced and shifted plantings as well as a reduction in yields caused by flooding.

Also, there is concern that late planting and cool weather will make corn and soybeans unusually susceptible to early frost damage, thereby reducing yields and crop quality.

By incorporating current information from committee members and from other crop and industry experts in conjunction with econometric projections, preliminary estimates of flood damage to Iowa crops were obtained. The estimates include both acres that were prevented from being planted and estimates of planted acres that were destroyed by flooding. Because this information is preliminary, it will, no doubt, be revised later. However, the report incorporates the best available information at the time of writing.

Major Crop Losses

Current information indicates that total planting in Iowa's corn and soybean sectors will be reduced by 0.9 million acres from March planting intentions: 0.6 million in corn and 0.3 million in soybeans. Harvested acres will decrease by 2.3 million acres (based on FAPRI, Table 1). FAPRI and USDA estimates differ slightly because FAPRI analysis indicates additional flex acres. Yield reductions for corn and soybeans are 19 percent and 18 percent, with monetary damage to these crops at \$916 and \$500 million, respectively.

Hay Losses

Iowa's hay industry suffered significant losses from reduced stands and flood kill, as well as from inability to harvest because of the continuing rain. Iowa's 6.8 million ton

Table 1. Iowa corn and soybean production and values

	Corn		Soybeans	
	USDA	FAPRI	USDA	FAPRI
million acres				
Planted Area				
Planting Intentions	12.6	12.6	8.5	8.6
Acreage Report, June 30	12.1	12.1	8.8	9.0
Crop Production, Aug. 11	12.0	12.0	8.5	8.3
Crop Production, Oct. 12	12.0	12.0	8.5	8.3
Harvested Area				
Planting Intentions	12.3	12.3	8.5	8.6
Acreage Report, June 30	11.8	11.8	8.8	9.0
Crop Production, Aug. 11	10.9	10.9	8.0	7.8
Crop Production, Oct. 12	10.8	10.8	8.0	7.8
bushels per acre				
Yield				
Planting Intentions	130.0	130.0	41.5	41.5
Acreage Report, June 30	NA	130.0	NA	41.5
Crop Production, Aug. 11 ^a	115.0	112.0	35.0	35.0
Crop Production, Oct. 12	105.0	105.0	34.0	34.0
million bushels				
Production				
Planting Intentions	1599	1599	351	355
Acreage Report, June 30	NA	1534	NA	371
Crop Production, Aug. 11	1254	1221	280	273
Crop Production, Oct. 12	1134	1134	272	265.2
dollars per bushel				
Price				
Expected Prices at Planting	\$1.95	\$1.97	\$5.50	\$5.58
Estimated Harvest Period Prices	\$2.30	\$2.25	\$6.25	\$6.15
Target Price	\$2.75	\$2.75	\$2.75	\$2.75
million bushels				
Production Loss from Planting Intentions^b	465	465	79	90
million dollars				
Value of Lost Production				
Market Receipts	\$907	\$916	\$433	\$500
Government Payments	\$84	\$82	\$0	\$0
Total Value of Lost Production^c	\$1,424	\$1,498		

^a August yield estimates by FAPRI assumed an average frost date recognizing that not all of the crop would be mature even with a normal frost date. If a frost occurred two weeks early, lower yields from lighter test weights and quality problems could reduce value per bushel by as much as 7.5 percent.

^b Production loss is based on October FAPRI estimates.

^c Total value of lost production includes market receipt losses and government payment losses for both corn and soybeans. The first column is implied total loss based on USDA estimates and the second column is total loss based on FAPRI estimates.

projected hay production would have been reduced to 4.6 million tons if CRP had not be released for haying. Current estimates place the total Iowa hay crop at 5.6 million tons. This translates into a 1.2 million ton decline in production with an economic value of \$96 million.

Indirect Livestock Impacts

Although there were direct flood losses to Iowa's production livestock industry—flooded facilities, animal stress, and death—the largest probable impact on Iowa's livestock industry will be indirect through reduced feed supplies and higher feed costs. By projecting feed cost increases and weighting these increases by average feed use, it was estimated that, over the coming year, total feed cost in Iowa will be 13.4 percent higher than would otherwise have been the case. Applying this percentage to projected feed use indicates that Iowa's livestock producers will see a decline in income of approximately \$157 million (assuming a baseline feed cost of \$1.2 billion).

Soil Erosion Losses

The Iowa Soil Conservation Service estimates 2.4 million acres of Iowa's farmland suffered severe erosion with soil losses of more than 20 tons per acre. It is too early to put a total cost here, but initial estimates only of damage to conservation and public facilities (such as terraces and buffer strips) are placed at approximately \$35 million.

Summary of Flood Damages

It is premature to make conclusive statements regarding the extent of flooding on Iowa's agriculture. The information required for a comprehensive assessment does not presently exist. However, member of the Iowa State

University Committee on Agricultural Flood Damage, using information from a variety of sources, have formulated preliminary estimates of agricultural flood damage. Estimated impacts are:

- \$1.5 billion in crop losses
- \$96 million in hay losses
- \$157 million in increased feed cost to the livestock and dairy industries
- 2.4 million acres severely eroded, with \$35 million in facility losses

Although these preliminary estimates indicate severe economic impacts, additional comments regarding individual farmer and business enterprise impacts are warranted. It is important to understand that the aggregate impact numbers mask the fact that there is a wide range of individual enterprise losses. Some enterprises may be only marginally affected while others might have incurred losses severe enough to threaten their economic survival. Figure 1 presents some different scenarios for a sample Iowa farm composed of 250 acres of corn and 250 acres of soybeans.

Implications for Iowa Crop Cash Receipts

There is little question that the impacts of the flood on production of corn and soybeans in Iowa are severe. However, if one considers the overall impact to all farmers in the state, the impact is less severe because of some offsetting factors. First, commodity prices have risen considerably since the flood began. Corn and soybean prices were expected to average only \$1.97 per bushel and \$5.58 per bushel at planting time, but are now expected to average \$2.25 per bushel and \$6.15 per bushel over the harvest period. Table 2 presents pre-flood and current estimates of

Figure 1. Implications of the 1993 flood for a sample Iowa farm

Assumptions: The sample farm has 250 acres of corn and 250 acres of soybeans	
Scenario 1	
Farm with 100 percent of Production Destroyed	
Corn Revenue Lost	(\$64,025)
Soybean Revenue Lost	<u>(\$57,893)</u>
Gross Revenue Loss	(\$121,918)
Scenario 2	
Farm with 50 percent of Acreage Not Planted and Yield Reductions	
Corn Revenue Lost	
Prevented Planting	(\$32,013)
Yield Loss	(\$6,156)
Soybean Revenue Lost	
Prevented Planting	(\$28,946)
Yield Loss	(\$5,231)
Corn Revenue Gained from Higher Prices	\$3,657
Soybean Revenue Gained from Higher Prices	<u>\$2,423</u>
Gross Revenue Loss	(\$66,249)
Scenario 3	
Farm with Ponding Loss (5 percent of Acreage Planted Lost) and Yield Reductions	
Corn Revenue Lost	
Acreage Not Harvestable	(\$3,201)
Yield Loss	(\$11,697)
Soybean Revenue Lost	
Acreage Not Harvestable	(\$2,895)
Yield Loss	(\$9,939)
Corn Revenue Gained from Higher Prices	\$6,983
Soybean Revenue Gained from Higher Prices	<u>\$4,603</u>
Gross Revenue Loss	(\$16,147)
Scenario 4	
Farm with No Acreage Loss, but with Yield Reductions	
Corn Revenue Lost from Yields	(\$12,313)
Soybean Revenue Lost from Yields	(\$10,463)
Corn Revenue Gained from Higher Prices	\$7,350
Soybean Revenue Gained from Higher Prices	<u>\$4,845</u>
Gross Revenue Loss	(\$10,580)
Scenario 5	
Farm with No Acreage Loss or Yield Reductions	
Corn Revenue Gained from Higher Prices	\$9,100
Soybean Revenue Gained from Higher Prices	<u>\$5,914</u>

Table 2. Flood implications for Iowa crop cash receipts

	1993/94		1992/93		Change From Current Estimates
	Pre-Flood Estimates	Net Change	Current Estimates	Actual	
Corn Production (Mil. Bu.)	1599	-465	1134	1903.65	-769.65
Harvest Period Price for Corn (\$/Bu.)	\$1.97	\$0.28	\$2.25	\$1.96	\$0.29
Gross Cash Receipts From Farm Marketings (Mil. \$)	\$3,150	(\$599)	\$2,552	\$3,726	(\$1,175)
Gross Cash Receipts From Government Payments (Mil. \$)					
Deficiency Payments	\$678	(\$297)	\$384	\$712	(\$328)
0/92 Payments	\$155	\$32	\$187	\$158	\$29
Soybean Production (Mil. Bu.)	355	-90	265	364	-99
Harvest Period Price for Soybeans (\$/Bu.)	\$5.58	\$0.57	\$6.15	\$5.30	\$0.85
Gross Cash Receipts (Mil. \$)	\$1,980	(\$349)	\$1,631	\$1,930	(\$299)
Disaster Assistance (Mil. \$)	\$0	\$267	\$267	NA	NA
Federal Crop Insurance (Mil. \$)	\$0	\$94	\$94	NA	NA
Net Cash Receipts Lost From Corn and Soybeans (Mil. \$)	(\$853)				
Hay Production (Mil. Tons)	6.8	-1.16	5.64	6.6	-1.0
Harvest Period Price For Hay (\$/Ton)	\$80	\$5	\$85	\$77.38	\$7.62
Gross Cash Receipts (Mil. \$)	\$544	(\$65)	\$479	\$512	(\$32)
Net Cash Receipts Lost from Hay (Mil. \$)	(\$65)				

gross cash receipts from corn, soybeans, and hay. The net difference between pre-flood estimates and current estimates of market soybean and corn cash receipts is -\$948 million. Note that this loss is significantly lower than the value of production loss of \$1.5 billion in Table 1. The difference is the higher price levels that offset part of the production loss. The same is true for hay. While the total value of lost hay production is \$96 million, the rise in hay prices is expected to offset this loss by \$31 million, reducing the net loss to \$65 million.

However, while higher prices boost receipts from farm marketings, they also reduce deficiency payment rates. In effect, the deficiency payment rate was reduced from \$0.78 per bushel in the pre-flood estimates to \$0.50 per bushel in the current estimates. In addition, the total acreage eligible for deficiency payments also changes due to prevented planted acreage and destroyed acreage. For those farmers with prevented planting or destroyed acreage, the enrollment deadline for the 0/92 program option was extended to August 31. With a payment rate of \$0.66 per bushel (\$0.72 in the 0/92 program), it is clearly more attractive for farmers with destroyed acreage to enroll these acres in the 0/92 program. Since disaster payments will be made on 62.4 percent of these acres (assuming that 48 percent of corn farmers are enrolled in Federal Crop Insurance), farmers will actually receive 0/92 payments on the remaining 37.6 percent of the acreage enrolled. Subsequently, total deficiency payments are down \$297 million while 0/92 payments are up only \$32 million.

Another offsetting factor is government disaster assistance. Nearly \$1.9 billion in disaster assistance for crop flood damage has been approved for the affected states. Iowa's share of that disaster assistance is estimated to total at least \$267 million based on Iowa's crop damage.

Finally, participants in Federal Crop Insurance will receive insurance payments on their crops that were destroyed. Since participation in Federal Crop Insurance is so low, only \$94 million is expected to be paid out to Iowa farmers.