DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
University of Arkansas System

Agriculture and Natural Resources

FSA93

Preliminary Analysis Suggests Historic Flooding Results in $79 Million in Crop-Related Damages

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Background

Between April 2, 2025 and April 5, 2025, the National Weather Service at Little Rock, Arkansas and Memphis, Tennessee reported the equivalent of three months' worth of expected[1] rainfall (i.e., 12 inches), with six inches of rain reported on April 5 alone. While early season rainfall is generally beneficial to agriculture, excess rainfall can result in significant economic losses for farmers and others throughout the agricultural industry. In this fact sheet, we estimate the economic impact of this "generational" flooding (Brooks, 2025) on the Arkansas agricultural crop sector. Using field-level reports, crop enterprise budgets, and historical insurance loss data, we provide a preliminary estimate of the economic impact to be $78,932,457.

Field-Level Data Collected on Flooded Crop Acreage

We surveyed county extension agents across 32 impacted counties in Arkansas, which account for nearly 90 percent of all historical[2] acres planted, and asked them how many acres had been planted before the flood event and how many acres were flooded during the April 2-5 time frame. We collected acreage data for corn, rice, soybeans and wheat, since these crops had either some acreage planted or had a fully emerged crop before the flood event.

The 2025 planted acreage, reported as of April 7, 2025, totaled 839,798 acres (i.e., 13 percent of historical acreage) with 31percent of these acres reported as having been flooded. Corn, rice, soybeans, and wheat accounted for 23, 46, 30, and 1 percent of total flooded acres, respectively. This is reflective of the planting progress of each crop, as well as the historical crop mix with corn, rice, soybeans and wheat accounting for 8, 22, 50, and 8 percent of historical acres planted, respectively. A county-specific breakdown of flooded acreage is provided in figure 1 below.

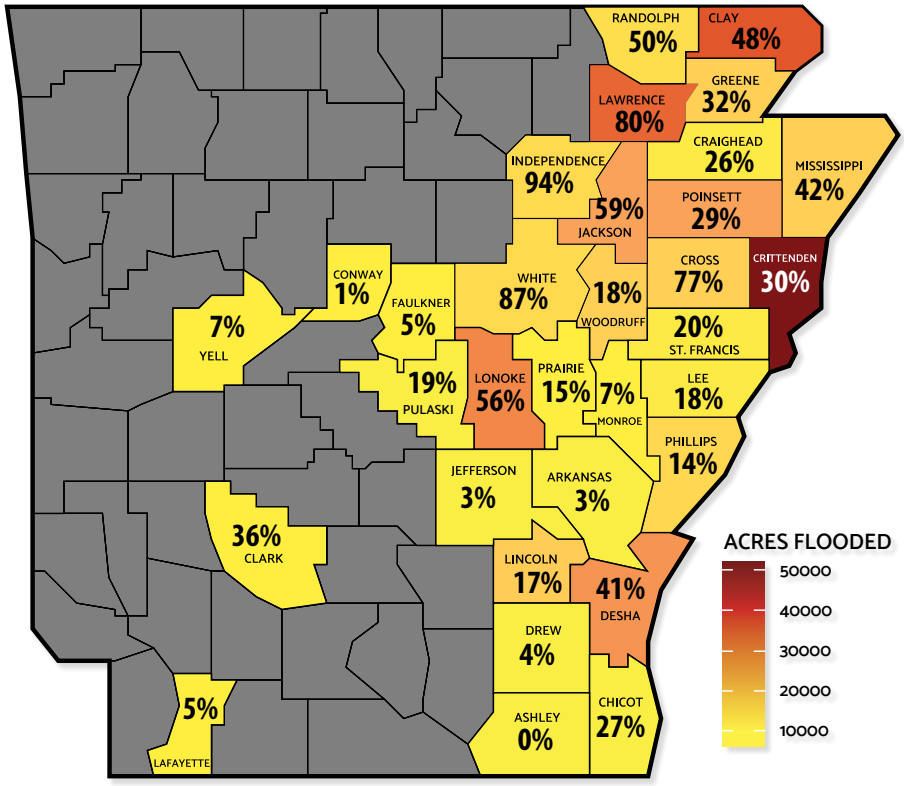
Measuring Economic Impact Using Replant and Production Losses

Planting expenses are accounted for using operating costs

[1] According to the 1991-2020 NWS daily Precipitation normal, 12.60 inches is the usual accumulated rainfall total over the January through March time frame.

[2] We define "historical acres planted" to be the average of USDA-NASS planted acreage for principal crops grown in Arkansas (i.e., corn, cotton, peanuts, rice, sorghum, soybeans, wheat) over the span 1999-2023. This equates to an average of 6,400,695 plan ted acres.

Figure 1. County-Level Crop Acres Flooded by Generational Flood Event on April 2-5, 2025
(Percentage indicates flooded acres as a portion of ares planted. Counties in grey did not report any flooded acres.)



Source U of A System, Division of Agriculture, Cooperative Extension Service. Author Hunter D. Biram

from the 2025 University of Arkansas System Division of Agriculture crop enterprise budgets. Only cost items such as seed, fertilizer, herbicides, labor and diesel are incurred when replanting a crop, while the remaining operating expenses (e.g., crop insurance, interest and cash rent) are only incurred in the initial planting.

Corn, rice, and soybean acres are assumed to be replanted, while wheat is not and is considered to have a total loss from flooded acres. From this perspective, the foregone wheat crop value over flooded acres amounts to $7,628,348 (Table 1), while the sunk cost of planting that wheat crop is $10,570,390 (Table 2). Total flood damage estimates for the wheat crop alone amount to roughly $18 million. Replanting expenses over the flooded acres for corn, rice, and soybeans total $11,443,532, $20,919,202, and $9,681,286, respectively. Total replanting expenses from flooded acres for all three crops amount to $42,044,021.

Leveraging Historical Crop Insurance Losses

We leverage loss data from the USDA Risk Management Agency to determine the potential prevented planting and replant indemnities for corn, soybeans and rice, as well as potential production losses for wheat. Using data on purchased liability from the RMA Summary of Business and indemnities by month and Cause of Loss data files, we construct two key measures: estimated liability for 2025 and the expected indemnity per dollar of liability (USDA-RMA, 2025a and USDA-RMA, 2025b). Since RMA does not release complete data on purchased liabilities until the year following the harvest of an insured crop, we estimate the liability following a method outlined in Biram, et al. (2024). We estimate the expected loss by taking an average of the ratio between indemnities reported in April for excess rainfall and purchased liability for each crop from 1989-2023. We multiply the estimated liability and this ratio for each crop and add them together to arrive at $18,689,699 in estimated indemnities because of the flood event.

Conclusion

We have estimated the economic impact of the "generational" flood in April to agricultural crops produced in 32 counties across Arkansas. Using field-level reports of planted and flooded acres, planting expenses from the UADA crop enterprise budgets, and historical crop insurance loss data, we estimate that the economic losses total $78,932,457. We breakdown the major loss categories into sunk costs and foregone value of production for wheat, replant expense, and expected indemnities which are $10,570,390, $7,628,348, $42,044,021, and $18,689,699, respectively. We recognize that this is a conservative estimate as we have not accounted for yield loss resulting from late planting, damage to farm structures

FOREGONE VALUE	EXPECTED MYA PRICE (PER BUSHEL)	PROJECTED STATE AVERAGE YIELD (PER ACRE)	TOTAL FOREGONE VALUE
Wheat	$5.65	60.00	$7,628,347.50

Table 1. Foregone Wheat Crop Value Estimate.

Seed	$40.00
Custom Spray & Fertilizer	$191.75
Herbicides/insecticides/Fungicides	$44.95
Crop Consultant	$5.00
Crop Insurance	$27.00
Operator Labor	$7.18
Diesel	$13.42
Repair & Maintenance	$15.48
Interest Op. Capital (8.31%)	$21.49
Operating Exp Per Acre (No Rent)	$366.27
Operating Exp Per Acre (Cash Rent[3])	$517.77
Acres Planted	22,502.50
Operating Expense (No Rent) (31.70%)	$2,612,699.73
Operating Expense (Cash Rent) (68.30%)	$7,957,690.18
TOTAL OPERATING EXPENSE (SUNK COST)	$10,570,389.91

Table 2. Total Operating Expenses (Sunk Cost) of the Wheat Crop

	Corn	Rice	Soy
Seed	$33.52	$42.94	$19.25
Custom Spray & Fertilizer	$122.85	$84.51	$53.53
Herbicides	$29.47	$38.33	$43.37
Operator Labor	$10.37	$11.93	$9.26
Diesel	$7.72	$10.68	$8.73
Total Op. Expense (Replant/Acre)	$203.93	$188.39	$134.14
Impacted Acres	56,115.00	111,042.00	72,173.00
TOTAL REPLANT EXPENSES	$11,443,531.95	$20,919,202.38	$9,681,286.22

Table 3. Post-Flood Replant Expenses

(e.g., grain bins) and unreported acreage that is flooded. We note that this is a preliminary damage estimate and plan to incorporate flooded acreage measured by satellite imagery as more county-level reports are provided. We further note that these losses are one-third of the projected economic assistance to be received by Arkansas crop producers, highlighting the significance of this flood event in the face of multi-year declines in net farm income and heightened market volatility.

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[3]Rent is accounted for by leveraging the 2022 Census of Agriculture for Arkansas. The proportion of tenant acres (68.3%) and owned acres (31.7%) are applied to planted acreage to account for additional expenses incurred by tenant farmers. Cash rent value is assumed to be $151.50/acre based on an average of the USDA-NASS 2024 Arkansas County Cash Rent Survey (USDA-NASS, 2024).

Acknowledgment

We would like to thank the UADA-CES County Agriculture Extension agents for providing timely and useful acreage reports. Without them, the estimates provided here would not be possible.

Printed by University of Arkansas Cooperative Extension Service Printing Services.

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FSA93-PD-4-2025