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Analysis Suggests Historic Flooding Results in $99 Million in Crop-Related Damages

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Background

Over the span of April 2, 2025 through April 5, 2025, the National Weather Service (NWS) at Little Rock, Arkansas and Memphis, Tennessee reported the equivalent of three months of expected[1] rainfall (i.e., 12 inches) with six inches of rain reported on April 5th, alone. While early season rainfall is generally beneficial to produce agricultural crops, excess rainfall can result in significant economic losses leaving farmers and those throughout the industry left to deal with the fallout. 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 final estimate of the economic impact to be $99,460,563.

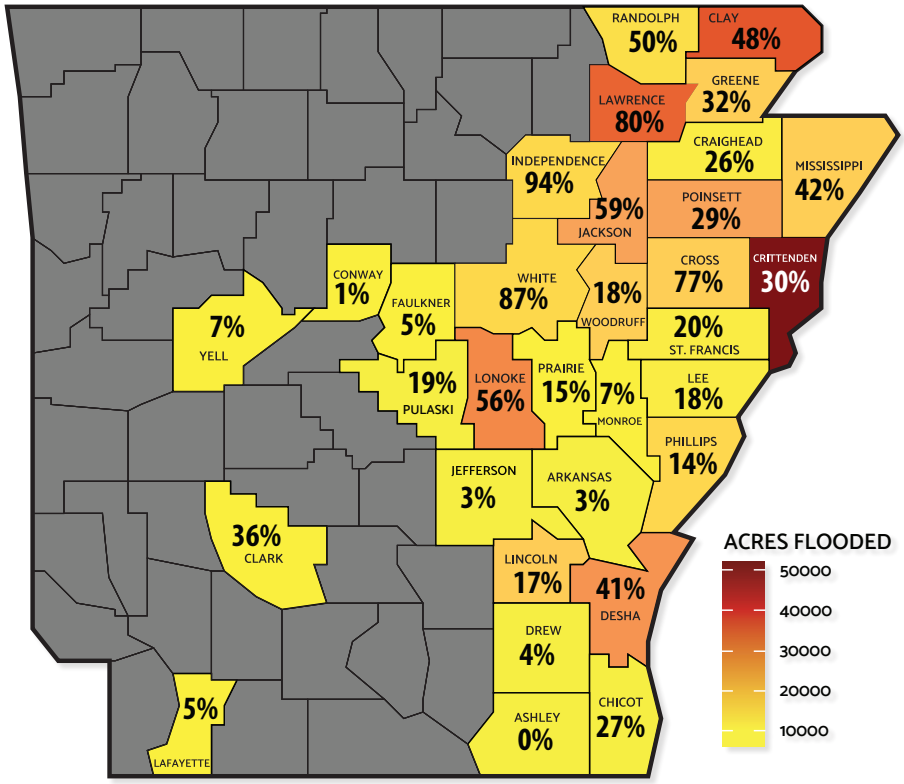
Field-Level Data Collected on Flooded Crop Acreage

We surveyed county extension agents across 32 impacted counties in Arkansas, which account for nearly 90% of all historical[2] acres planted, and asked them how many acres had been planted prior to the flood event and how many acres were flooded over the April 2-5 time frame. We collected acreage data for corn, rice, soybeans, and wheat since these crops have either had some acreage planted or had a fully emerged crop prior to the flood event. The 2025 planted acreage totaled 839,798 acres (i.e., 13% of historical acreage) with 31% of these acres reported as having been flooded as of April 7, 2025. Corn, rice, soybeans, and wheat accounted for 23%, 46%, 30%, and 1% 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% of historical acres planted. A county-specific breakdown of flooded acreage is provided in figure 1 below. Additionally, a real-time satellite image of impacted land area as of April 8-9, 2025 is provided in Figure 2 to ground-truth reported acres.

[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.

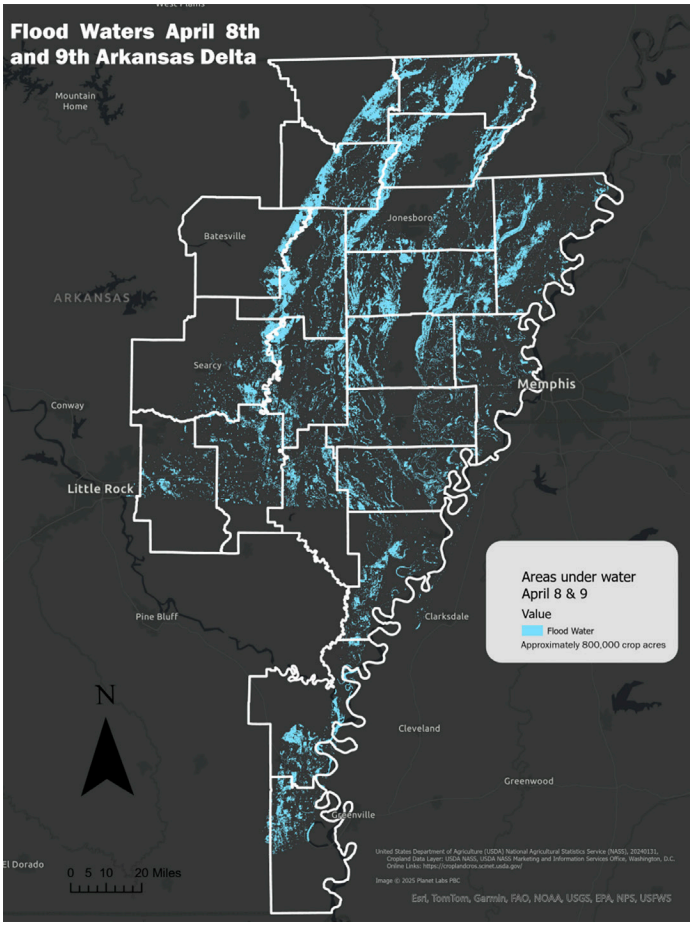
[2] We define "historical acres planted" to be the average of USDA-NASS planted acreage for principal crops grown in Arkansas (i.e., corn, cotton, peanuts, rice, sorghum, soybeans, wheat) over the span 1999-2023. This equates to an average of 6,400,695 planted acres.

Figure 1. County-Level Crop Acres Flooded by Generational Flood Event on April 2-5, 2025
(Percentage indicates flooded acres as a portion of acres 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

Figure 2. Flooded Land Area Across Arkansas Delta Region on April 8-9, 2025 (Source: Planet Labs PBC, 2025)



Measuring Economic Impact Using Replant and Production Losses

Planting expenses are accounted for using operating costs from the 2025 University of Arkansas System, Division of Agriculture (UADA) 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 and have a 10% yield loss due to the extended flooding period. This yield loss is considered as a foregone value for the impacted crops (Table 1). Flooded wheat acres will not be replanted and are considered to have a total loss from flooded acres. From this perspective, the foregone wheat crop value over flooded acres amounts to $610,200 (Table 1), while the sunk cost of planting that wheat crop is $43,333,784 (Table 2). Total flood damage estimates for the wheat crop alone amount to roughly $44 million. On the other hand, replanting expenses over the flooded acres for corn, rice, and soybeans total $10,961,034, $8,499,026, and $8,874,137, respectively (Table 3). Total replanting expenses from flooded acres for all three crops amount to $28,334,197.

FOREGONE VALUE	EXPECTED MYA PRICE (PER BUSHEL)	PROJECTED STATE AVERAGE YIELD (PER ACRE)	TOTAL FOREGONE VALUE
Wheat	$5.65	60.00	$610,200.00
Corn	$4.20	187.00	$2,380,311.78
Rice	$12.00	76.40	$4,771,944.00
Soybeans	$10.25	55.00	1,340,428.38
Total			$9,102,884.16

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	92,250
Operating Expense (No Rent) (31.70%)	$10,710,879
Operating Expense (Cash Rent) (68.30%)	$32,622,905
TOTAL OPERATING EXPENSE (SUNK COST)	$43,333,784

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

Leveraging Historical Crop Insurance Losses

We leverage loss data from the USDA, Risk Management Agency (RMA) 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 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 over the span 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 $99,460,564. We breakdown the major loss categories into sunk costs, foregone value of production, replant expense, and expected indemnities which are $43,333,784, $9,102,884, $28,334,197, and $18,689,699, respectively. 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.

	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	53,749.00	45,114.00	70,761.00
TOTAL REPLANT EXPENSES	$10,961,034	$8,499,026	$8,874,137

Table 3. Post-Flood Replant Expenses

Acknowledgement

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.

[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).

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