Estimated Potential Economic Benefits from Implementation of Practice 590 — Nutrient Management on Acres with Excessive Nutrient Loss

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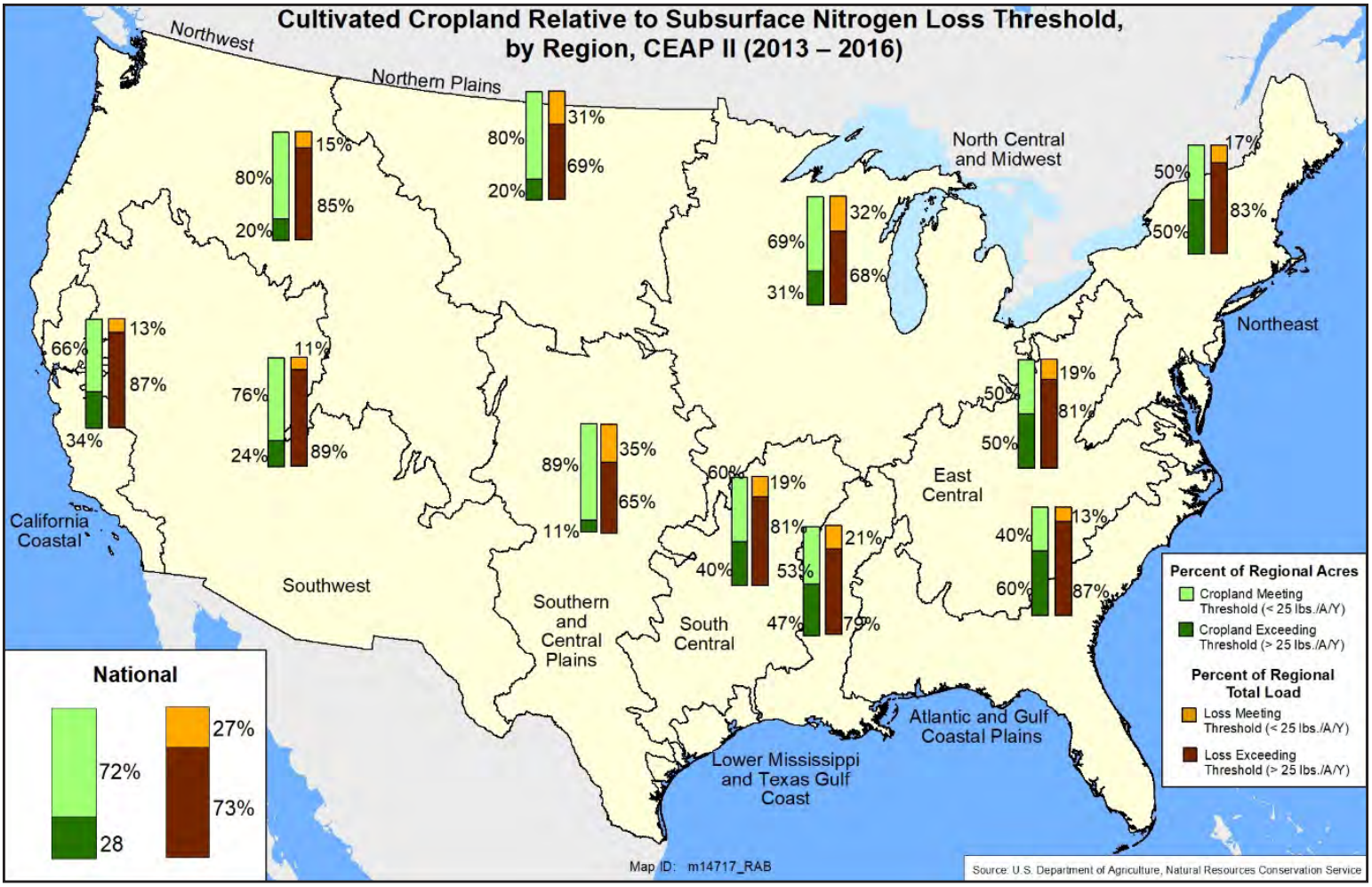
When nutrient management (CPS 590) is implemented, how much does a producer save per acre on their fertilizer bill?

Based on published data and reports[1], the average per acre net benefits[2] for all farms having cropland receiving excess nutrients are $29.28 and range from a low of $23.77 to a high of $49.76[iii] among these farms.

Figure 1 (below) highlights the regional differences in acres of cropland exceeding nitrogen loss threshold and the percent of total crop acres exceeding threshold. This figure indicates that at the national level, 28 percent of cropland acres were found to contribute 73 percent of nitrogen leaching[i] . This threshold is assumed to include cropland that exceeds twice the soil tolerance level.

Figure 1. Cultivated Cropland Relative to Subsurface Nitrogen Loss Threshold, by Crop Production Region, CEAP II (2013-2016).



1 See Citations and Assumptions and Methodology (end of report)
2 ERS report[ii], pg 36. Net benefits are the benefits from reduced fertilizer costs minus other implementation costs.

Table 1 (below) highlights the total net savings that potentially could be achieved should all acres that exceed the Nitrogen Loss Threshold were treated within each production region, and nationally. In other words, if all 89 million acres of cropland exceeding the nitrogen loss threshold in the United States were treated (28% of total cropland), then the average net savings would be $2.6 billion, but might be as low as $2.1 billion, or as much as $4.4 billion. Ranges are based on the findings within the ERS report.

Table 1. Total Crop Acres, Percent of Total Cropland Exceeding Nitrogen Loss Threshold, and Potential Net Savings if Producers Implement Nutrient Management on Exceeding Acres (2022 Dollars).

Contiguous U.S. Production Region	Total Cropland exceeding threshold (Thousand Acres)	Total Cropland Acres (Thousand Acres)	Percent of Total Cropland Exceeding Threshold	Net Savings for those exceeding threshold by region/nationally (Million dollars)		
				Average	Low	High
Atlantic and Gulf Coastal Plains	8,260	13,825	60%	$242	$196	$411
California Coastal	1,311	3,913	33%	$38	$31	$65
East Central	5,055	10,166	50%	$148	$120	$252
Lower Mississippi and Texas Gulf Coast	9,886	20,916	47%	$289	$235	$492
North Central and Midwest	38,371	123,296	31%	$1,124	$912	$1,909
Northeast	3,769	7,597	50%	$110	$90	$188
Northern Plains	9,988	51,130	20%	$292	$237	$497
Northwest	2,684	13,438	20%	$79	$64	$134
South Central	2,045	5,107	40%	$60	$49	$102
Southwest	764	3,183	24%	$22	$18	$38
National	**88,914**	**315,303**	**28%**	**$2,604**	**$2,114**	**$4,424**

ASSUMPTIONS AND METHODOLOGY

In 2018, nutrient management implementation costs were found to average $34.30 per acre and did not vary much across what are described as "excess nitrogen" categories (ERS)[ii] .Updated to 2022 prices based on NASS data[iii] (which include January through April 2022, as of the date when this report was prepared (NASS).

The ERS report suggests that the majority of the Mississippi/Atchafalya River Basin (MARB) farms have low or no excess nitrogen application rates. Only 14.4 percent of farms in the MARB, controlling 25.1 percent of cropland, apply nitrogen in excess of crop needs. These farms contribute 88.1 percent of all excess nitrogen applications in the MARB. These findings are consistent in indicating that a small number of farms are major contributors of excess nitrogen.

i Conservation Practices on Cultivated Cropland: A Comparison of CEAP I and CEAP II Survey Data and Modeling, Conservation Effects Assessment Project, USDA, March 2022. https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcseprd1893221.pdf

ii Marshall, Elizabeth, Marcel Aillery, Marc Ribaudo, Nigel Key, Stacy Sneeringer, LeRoy Hansen, Scott Malcolm, and Anne Riddle. Reducing Nutrient Losses From Cropland in the Mississippi/Atchafalaya River Basin: Cost Efficiency and Regional Distribution, ERR-258, U.S. Department of Agriculture, Economic Research Service, September 2018

iii USDA National Agricultural Statistical Service – "Indexes of Prices Paid, Chemicals, Fertilizer, and Fuels, United States: 2011=100". https://www.nass.usda.gov/Charts_and_Maps/graphics/data/prod1.txt, April 2022.