Preliminary Assessment of **AGRICULTURAL LOSSES AND DAMAGES** Resulting from **HURRICANE IDALIA**



Image courtesy of NASA

Christa D. Court, Xiaohui Qiao, Mengming Li, Kelsey McDaid Food and Resource Economics Department University of Florida, Institute of Food and Agricultural Sciences (UF/IFAS) Gainesville, Florida **September 21, 2023**



ECONOMIC IMPACT ANALYSIS PROGRAM

fred.ifas.ufl.edu/economicimpactanalysis

INTRODUCTION

The tropical system that would eventually become Hurricane Idalia became a tropical depression on August 26, 2023 as it moved across the western Caribbean Sea. Later, it rapidly intensified, strengthening into a hurricane on August 29, briefly attaining Category 4 (Cat. 4) strength prior to making landfall at Keaton Beach, FL as a strong Cat. 3 hurricane. Hurricane Idalia then moved northeast, impacting a broad swath of northern Florida and crossing into southeast Georgia as a Cat. 2 hurricane. Afterwards, it continued to travel northeast through the state, subsequently impacting South Carolina and North Carolina as a tropical storm (TS) before re-entering the Atlantic Ocean.

Tropical cyclones, such as Hurricane Idalia, can significantly impact production agriculture. Producers can experience both losses (changes in economic flows) resulting from a change in the level or value of sales or a change in input costs and they can also experience damages (changes in economic stocks) that require repair or replacement. Agricultural losses might result from situations such as wind-damaged field and row crops, crop losses due to high winds in a pecan grove, water quality or mortality issues for shellfish aquaculture operations, lower milk production at a dairy farm due to stressed dairy cattle or the need to dump milk due to issues with cold storage during a power outage, or even a lower sales price for a beef cattle rancher that had cattle that were not able to get the appropriate nutrition due to stress or damaged grazing lands. Agricultural assets at risk for damages include fencing, irrigation systems, farm homes, farm buildings, greenhouse and nursery structures, machinery/equipment, other infrastructure, livestock animals, and perennial plantings such as pecan or citrus trees and vineyards.

EVENT DATA AND IMPACTED AGRICULTURAL LANDS

The wind swath of Hurricane Idalia, as published by the National Oceanic and Atmospheric Administration (NOAA) National Hurricane Center (NHC), is shown in Figure 1. Major hurricane (Cat. 3) conditions impacted six counties in northern Florida: Suwannee, Madison, Hamilton, Lafayette, Taylor, and Dixie. A larger swath of the Florida peninsula experienced tropical storm force winds, which extended as far south as Charlotte County.

The same wind swath pattern with agricultural lands identified in bright green is shown in Figure 2. A summary of the commodity groups that were affected by the different wind speed zones is provided in Table 1.





Figure 1. Wind swath pattern of Hurricane Idalia as it impacted Florida. Statewide view of Hurricane Idalia wind swath presented in Panel A. Closer view of Hurricane Idalia wind swath with Florida counties labeled presented in Panel B.

Source: The geospatial data for wind swath of Hurricane Idalia are derived from products published by NOAA NHC (https://www.nhc.noaa.gov/gis/).



Figure 2. Wind swath pattern of Hurricane Idalia with affected Florida agricultural lands identified. Statewide view of Hurricane Idalia wind swath and Florida agricultural lands presented in Panel A. Closer view of Hurricane Idalia wind swath including the Cat. 3 windspeeds (111 - 129 mph) and Florida agricultural lands with Florida counties labeled presented in Panel B.

Source: The geospatial data for wind swath of Hurricane Idalia are derived from products published by the NOAA NHC (<u>https://www.nhc.noaa.gov/gis/</u>). The geospatial data for agricultural lands are from the FDACS FSAID ALG (<u>https://www.fdacs.gov/Agriculture-Industry/Water/Agricultural-Water-Supply-Planning</u>).

		Total				
Commodity Group	TS1	TS2	Cat. 2	Cat. 3	Iotai	
Citrus	186,700	-	-	-	186,700	
Field and Row Crops	194,400	160,300	4,800	84,800	444,200	
Fruit (Non-citrus) and Tree Nuts	3,100	1,900	-	100	5,100	
Greenhouse/Nursery	31,600	3,800	100	1,700	37,300	
Animals and Animal Products	2,261,000	245,300	6,800	85,800	2,598,900	
Vegetables and Melons	45,200	2,800	1,100	4,900	54,100	
Total	2,722,100	414,200	12,700	177,300	3,326,300	

Table 1. Estimated agricultural acreage affected by Hurricane Idalia by commodity group and wind speed zone.

Note: Citrus acreage includes bearing and non-bearing acreage. Field and Row Crops acreage includes field crops and hay. Animals and Animal Products acreage includes acreage associated with aquaculture, grazing land, and livestock operations. Values rounded to the nearest 100. Source: Authors' own calculations based on data from NOAA NHC, FDACS FSAID, and USDA-NASS.

More than 3.3 million acres of Florida's agricultural lands were affected by Hurricane Idalia, of which almost 74% was grazing land. Over 177,000 acres of agricultural lands (46% grazing land) were affected by major hurricane (Cat. 3) conditions. The commodity groups that were most affected (in terms of acreage) by hurricane (Cat. 2 or 3) conditions were Animals and Animal Products, and Field and Row Crops.

Estimated values (2023\$) of annual production on the affected acreage by commodity group and wind speed zone are displayed in Table 2. Data published by the United States Department of Agriculture's National Agricultural Statistics Service (USDA-NASS) on price and yield were used to estimate value per acre in Florida for individual crops within commodity groups. Where not available, value per acre was estimated using commodity-level price and yield at the national level or using sales revenue data for the aggregated commodity group in Florida counties from IMPLAN¹. The resulting five-year averages (2018-2022, converted to 2023\$) of value per acre are used to estimate the value of production on affected acreage by commodity group and wind speed zone.

¹IMPLAN data are not available for 2022 at the time this report was prepared so commodity groups that use IMPLAN sales revenue data use a fiveyear average for the period 2017-2021, still converted to 2023\$. For more information, visit IMPLAN.com. **Table 2.** Estimated value of production on affected acreage in Florida by commodity group and wind speed zone.

Commodity Crown	Annual Value	Total			
Commonly Group	TS1	TS2	Cat. 2	Cat. 3	Iotai
Citrus	\$437,200,000	\$0	\$0	\$0	\$437,200,000
Field and Row Crops	\$135,400,000	\$111,400,000	\$3,100,000	\$63,700,000	\$313,600,000
Fruit (Non-citrus) and Tree Nuts	\$5,800,000	\$2,500,000	\$0	\$200,000	\$8,600,000
Greenhouse/ Nursery	\$1,126,300,000	\$43,900,000	\$500,000	\$16,700,000	\$1,187,400,000
Animals and Animal Products	\$767,100,000	\$312,200,000	\$4,000,000	\$148,900,000	\$1,232,200,000
Vegetables and Melons	\$663,200,000	\$24,500,000	\$9,900,000	\$52,400,000	\$750,100,000
Total	\$3,135,000,000	\$494,500,000	\$17,500,000	\$282,000,000	\$3,929,000,000

Note: Values rounded to the nearest 100,000.

Source: Authors' own calculations based on data from NOAA NHC, FDACS FSAID, USDA-NASS, and IMPLAN.

Agricultural lands in Florida that were affected by Hurricane Idalia typically produce over \$3.9 billion dollars of agricultural products (crops, livestock, aquaculture, etc.) throughout a calendar or marketing year. Agricultural lands in Florida experiencing hurricane conditions (Cat. 2 or 3 wind speeds) typically produce \$299.5 million dollars of agricultural products throughout a calendar or marketing year. The commodity groups that were most affected in terms of value by hurricane conditions include Animals and Animal Products, Field and Row Crops, and Vegetables and Melons.

Photo courtesy of survey respondent.







Photos courtesy of survey respondents.

ASSESSMENT OF PRODUCTION LOSSES FOR FLORIDA AGRICULTURE

The University of Florida Institute of Food and Agricultural Sciences (UF/IFAS) Economic Impact Analysis Program (EIAP) began collecting information on agricultural losses and damages resulting from tropical cyclone events in 2016 in the wake of Hurricane Irma and has been improving baseline and impact databases for these types of analyses since. On August 28th, 2023, The UF/IFAS EIAP distributed a survey titled Assessment of Losses and Damages to Florida Agriculture from Hurricane Idalia to begin assessing losses and damages associated with Hurricane Idalia. This survey instrument (IRB202300976) was developed to assist Florida's Cooperative Extension system in collecting information on the impacts of natural disasters using the Qualtrics[®] survey system, which is a licensed survey platform recognized for its robust data security, analytics, and logical control programming features. The online survey instrument collects information directly from the owners/operators of farms, ranches, and other production agriculture operations, or via representatives of Florida Cooperative Extension and/or local, state, or federal government agencies, allowing for more timely and accurate reports on observed losses and damages. In the days and weeks since, Florida Cooperative Extension began visually surveying their territories, communicating with producers, and sharing the invitation to participate in the survey to encourage participation.

On September 18th, 2023, completed survey responses were downloaded and prepped for analysis by investigators from the UF/IFAS EIAP. The investigators compiled the survey information for all commodities in each county affected by the disaster. This preliminary analysis of survey data along with observations from previously analyzed tropical cyclone events (Irma [2017], Michael [2018], Sally [2020], and Ian [2022]) were used to estimate a credible range on production losses (%) by commodity group for each wind speed zone by producing a "Low Scenario" and "High Scenario". These "Low" and "High" estimates of percentage production losses by commodity group and wind speed zone were then combined with available agricultural baseline data for the most recent year. Baseline data include information on acreage, value per acre, and season or growth stage for specific commodities. The baseline data are compiled from sources such as the USDA's 2017 Census of Agriculture, annual surveys by USDA-NASS, IMPLAN, Ask IFAS, as well as data published within the FDACS FSAID Geodatabase.

Table 3 displays the estimated annual production loss (%) information by commodity group, wind speed zone, and scenario. Note that these estimates of production loss percentages are preliminary and might change as additional information specific to Hurricane Idalia is collected. Production loss estimates in Table 3 convey the percentage of annual production (calendar year 2023 or marketing year 2023-2024) that has been lost due to Hurricane Idalia. Note that some producers (e.g. vegetable farms) have multiple growing seasons in Florida and others sell products yearround, which has been roughly accounted for in estimated loss percentage values, but further adjustments might be made as information on early harvesting prior to the event, delayed planting in the face of Hurricane Idalia, or the potential for growers to replant damaged or destroyed acreage is shared.

At this point in time, we are providing ranges on potential production losses as opposed to point estimates to reflect the uncertainty surrounding percentage production losses in the different areas that have been impacted by this event. The Low and High scenarios should be interpreted as low and high estimates of average losses for the relevant commodity group and wind speed zone combination and should not be interpreted as minimum and maximum values for individual producers or for commodity groups. Production losses that might occur in calendar year 2024, marketing year 2024-2025, or beyond as a result of the damages experienced by Hurricane Idalia are not assessed and would be "in addition to" these estimates. Importantly, production loss estimates do not include the value of damages or destruction to stored inputs, stored harvested products, or infrastructure (including perennial plantings and lost/deceased animals). Finally, these estimates do not account for the fact that some crop losses might be eligible for or covered by crop insurance or other risk management tools available to producers.

Considering all of this information, we believe that the production losses for agricultural producers (crops, livestock/aquaculture, and animal products) resulting from Hurricane Idalia will likely be between \$78.8 million and \$370.9 million. The estimated agricultural losses by commodity group and wind speed zone are displayed in Table 4.

Table 3. Estimated annual production loss by commodity group for Low and High scenarios based on preliminary analysis of survey data for Hurricane Idalia along with observations from previously analyzed tropical cyclone events (Irma [2017], Michael [2018], Sally [2020], Ian [2022]).

	Estimated Agricultural Production Losses due to Hurricane Idalia (%, Annual)									
Commodity Group	TS1		TS2		Cat. 2		Cat. 3			
	Low Scenario	High Scenario	Low Scenario	High Scenario	Low Scenario	High Scenario	Low Scenario	High Scenario		
Citrus	0%	5%	5%	15%	20%	40%	25%	55%		
Field and Row Crops	0%	20%	10%	30%	15%	40%	30%	50%		
Fruit (Non- citrus) and Tree Nuts	O %	20%	20%	50%	30%	60%	40%	70%		
Greenhouse/ Nursery	0%	5%	5%	15%	10%	20%	15%	35%		
Animals and Animal Products	O%	5%	5%	15%	10%	25%	10%	25%		
Vegetables and Melons	0%	5%	10%	25%	15%	30%	15%	35%		

Source: Authors' own calculations based on preliminary analysis of survey data for Hurricane Idalia along with observations from previously analyzed tropical cyclone events (Irma [2017], Michael [2018], Sally [2020], Ian [2022]).

Photo courtesy of survey respondent.





Photos courtesy of survey respondents.

Table 4. Estimated potential range of agricultural losses due to Hurricane Idalia by commodity group and wind speed zone (2023\$, Thousands).

Commodity	TS1		TS2		Cat. 2		Cat. 3		Total	
Group	Low Scenario	High Scenario								
Citrus	\$0	\$21,900	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$21,900
Field and Row Crops	\$0	\$27,100	\$11,100	\$33,400	\$500	\$1,300	\$19,100	\$31,900	\$30,700	\$93,600
Fruit (Non- citrus) and Tree Nuts	\$0	\$1,200	\$500	\$1,300	\$0	\$0	\$100	\$100	\$600	\$2,600
Greenhouse/ Nursery	\$0	\$56,300	\$2,200	\$6,600	\$100	\$100	\$2,500	\$5,800	\$4,700	\$68,800
Animals and Animal Products	\$0	\$38,400	\$15,600	\$46,800	\$400	\$1,000	\$14,900	\$37,200	\$30,900	\$123,400
Vegetables and Melons	\$0	\$33,200	\$2,500	\$6,100	\$1,500	\$3,000	\$7,900	\$18,300	\$11,800	\$60,600
Total	\$0	\$177,900	\$31,900	\$94,200	\$2,400	\$5,300	\$44,500	\$93,400	\$78,800	\$370,900

Estimated Agricultural Production Losses due to Hurricane Idalia (Thousands of 2023\$)

Source: Authors' calculations based on preliminary analysis of baseline data and survey data along with observations from previously analyzed tropical cyclone events (Irma [2017], Michael [2018], Sally [2020], Ian [2022]). Values rounded to the nearest 100,000.

Production losses associated with animal operations (beef and dairy cattle, poultry, shellfish aquaculture, etc.) and producers of animal products (milk, eggs, honey) are expected in the affected area (\$30.9 million - \$123.4 million) as a result of damaged fencing, damaged livestock sheds (barns, poultry houses, etc.) and watering points, damaged aquaculture structures, and widespread power outages and loss of feed. For example, dairy operations can experience production losses from a combination of stored milk that has to be dumped due to power losses and resultant losses in refrigeration, skipped milkings, and drops in milk production whereas beef cattle operations can experience production losses from stressed or injured cattle and lower quality feed, and shellfish aquaculture operations might experience production losses due to shellfish mortality or water quality issues.

Production loss estimates for Field and Row Crops in the affected area (\$30.7 million - \$93.6 million) are expected due to wind damaged crops and damaged infrastructure that might impede tending or harvesting crops including irrigation structures, tractors and other machinery, and storage structures. There are also reports that fallen trees and debris associated with physical damages of Hurricane Idalia have impeded the ability of producers to reach some fields.

Estimated production losses associated with Greenhouse/ Nursery operations are expected in the affected area (\$4.7 million - \$68.8 million) due to damaged hoop houses, greenhouse structures, and nursery infrastructure as well as widespread loss of electricity which is critically important for cooling and irrigation. Production losses estimated for Vegetables and Melons in the affected area (\$11.8 million - \$60.6 million) are heavily dependent on the time since planting for different crops in different regions affected by Hurricane Idalia as well as the ability (or inability) to harvest prior to the hurricane event or to replant damaged or destroyed crops. Many growers of vegetable and melon crops in regions impacted by only lower strength tropical storm conditions are reporting minimal to no losses but low-level losses on a large number of acres of high value crops can add up quickly.

There are currently no reports of widespread losses for citrus crops due to Hurricane Idalia but the result of low level production losses across a wide swath of citrus acreage that experienced tropical storm force conditions could reach \$21.9 million. Local severity of citrus losses will depend on the level of fruit drop and damage to branches that might have occurred from winds produced by Hurricane Idalia.

Estimated production losses for Fruit (non-citrus) and Tree Nuts in the affected area (\$0.6 million - \$2.6 million) are expected due to damages from wind. Within this commodity group, there are several reports of significant losses to pecans, even in the areas that experienced only tropical storm conditions.

Results for production losses estimated by commodity group and wind speed zone are visualized in Figure 3, which highlights the fact that the Animals and Animal Products and Field and Row Crops commodity groups experienced the largest levels of losses. As evident in Figure 3, the large differences in the production losses experienced by all commodity groups within the regions that experienced weaker tropical storm conditions are driving the large difference in total production losses estimated across the Low and High scenarios. This is due to the fact that many producers in this region are reporting minimal to no losses (hence, 0% losses modeled for the Low scenario) but even low-level losses for a large number of acres of high value crops can result in significant loss values for this wind speed zone.



Figure 3. Estimated agricultural production losses in Florida due to Hurricane Idalia by commodity group and wind speed zone. Results for the Low Scenario are presented in Panel A and results for the High Scenario are presented in Panel B.

Source: Authors' own calculations based on preliminary analysis of baseline data and survey data for Hurricane Idalia along with observations from previously analyzed tropical cyclone events (Irma [2017], Michael [2018], Sally [2020], Ian [2022]).



Photos courtesy of survey respondents.

INFRASTRUCTURE

Currently, data limitations associated with baseline conditions on agriculture-related infrastructure (buildings, fencing, machinery, and equipment) as well as the number and level of detail within the responses to the UF/IFAS Agricultural Damage Assessment Survey for Hurricane Idalia related to infrastructure damages prevent an accurate estimate of the value of damaged/destroyed infrastructure or the repair/replacement costs for damaged/ destroyed infrastructure. Unfortunately, detailed baseline databases recording the current number, type, and value of buildings, fencelines, equipment, and machinery do not exist to support an estimate of the exact (or close to exact) hurricane conditions experienced by each building, machine, or piece of equipment. In addition, not all survey respondents provide data on infrastructure damages and the level of detail collected on infrastructure damages from survey respondents that do provide this information is not enough to extrapolate to area-, county-, or state-wide estimates of the value of damage/destroyed infrastructure or the associated repair/replacement costs. However, some limited, publicly available data do exist related to the quantity and potential value of agricultural infrastructure in the impacted region of Florida, which are summarized below and can provide some level of understanding of the potential enormity of the issue of damages to agricultural infrastructure due to Hurricane Idalia.

Structure Footprint Data

The Federal Emergency Management Agency's (FEMA) USA Structures geospatial data, which includes an inventory of all structures with a footprint larger than 450 square feet, provides a data source for estimating the number and square footage of agricultural structure footprints within the path of Hurricane Idalia. These data can provide an estimate of the square footage of structure "at risk" of significant damage during this event. A summary of the square footage of agricultural structure footprints by wind speed zone is provided in Figure 4. As structural damage does not appear to be significant within areas that experienced weaker tropical storm conditions (TS1), the totals do not include data from areas that experienced only TS1 conditions. Note that the square footage represents only the structures' footprints and does not account for square footage on floors above the first level in multi-story structures. As many agricultural structures are singlestory structures, we assume that the square footage of the agricultural structure footprints is a reasonable proxy for overall square footage of agricultural structures.

The footprint of structures on the Florida agricultural lands impacted by strong tropical storm (TS2) or hurricane

conditions (Cat. 2 and 3) is 18.0 million square feet and 10.6 million square feet, respectively. As a comparison, this 28.6 million square feet footprint of agricultural structures in the path of Hurricane Idalia is nearly 20 times larger than the footprint of The Pentagon in Arlington, VA, including the area encompassed by the central courtyard. Since there are many different types of structures on agricultural lands with a wide variety of values and the FEMA USA Structures geo-database does not provide information on the type of agricultural structure, it is not possible to accurately convert from area (square feet) to estimated current value (or to estimated repair/replacement costs).

Footprint and Structures by Wind Speed Zone



Figure 4. Number of structures and footprint of structures on Florida agricultural lands impacted by strong tropical storm (TS2) or hurricane conditions (Cat. 2 and 3) by wind speed zone.

Note: Square footage represents the building footprint only and does not account for square footage on floors above the first level in multi-story structures. Structures with a footprint of less than 450 square feet are not included in the database.

Source: FEMA USA Structures geospatial data (<u>https://gis-fema.hub.arcgis.</u> com/pages/usa-structures).

Data on Value of Agriculture-Related Buildings and Machinery/Equipment

The 2017 Census of Agriculture, published by the USDA, contains county- and state-level data on the current value (2017\$) of buildings, machinery, and equipment on farms as of 2017. Combined with the data on Hurricane Idalia's wind swath, these data can be used to estimate the value of buildings, machinery, and equipment that were at risk of damage/destruction in areas experiencing hurricane (Cat. 2 or 3) or strong tropical storm (TS2) conditions. Importantly, this value is not an estimate of the value of damage/ destroyed buildings, machinery, and equipment nor is it an estimate of the repair/replacement costs for damage/ destroyed buildings.

In the areas of Florida impacted by Hurricane Idalia, the estimated value of the buildings that were present in 2017

on the agricultural lands impacted by hurricane conditions (Cat. 2 or 3) was \$563.9 million (expressed in 2017\$), which would be valued at \$746.0 million (2023\$) after adjusting for inflation using the GDP implicit price deflator, published by the St. Louis Federal Reserve Bank. The estimated value of the machinery and equipment present in 2017 on the agricultural lands impacted by hurricane conditions (Cat. 2 or 3) was \$157.0 million (expressed in 2017\$), which would be \$192.2 million (2023\$) after adjusting for inflation.

Similarly, the estimated value of the buildings that were present in 2017 on the agricultural lands impacted by strong tropical storm conditions (TS2) was nearly \$1.5 billion (expressed in 2017\$), which would be valued at over \$1.8 billion (2023\$) after adjusting for inflation. The estimated value of machinery and equipment present in 2017 on the lands impacted by strong tropical storm conditions (TS2) was \$307.6 million, which would be \$376.6 million (2023\$) after adjusting for inflation.

Note that these estimates do not capture the value of buildings, machinery, or equipment built or acquired after the 2017 Census of Agriculture was completed. These values are also not adjusted for buildings, machinery, or equipment that were demolished or are no longer present/used and they are not adjusted for depreciation over the period 2017-2023. It is also important to note that the accuracy of these values for 2017 might be influenced by the response rate on the 2017 Census of Agriculture.

Irrigation Equipment

The Irrigated Lands Geodatabase (ILG) that is published within the FDACS FSAID Geodatabase provides information on irrigated agricultural lands in Florida as of 2021, including information on the type of irrigation system used. This database suggests that there are over 140,000 acres of irrigated agricultural lands impacted by Hurricane Idalia's hurricane (Cat. 2 or 3) or strong tropical storm (TS2) conditions, 89% of which employ center pivot or lateral move systems (125,000+ acres). Anecdotally, there are many reports of these types of systems sustaining heavy damage from Hurricane Idalia, especially in the areas experiencing hurricane conditions. As these center pivot and lateral move systems come in different sizes and are used to irrigate a wide range of farm/field sizes, there is not a good method of converting from acreage irrigated by center pivot/lateral move systems to number of center pivots or lateral move systems or to further convert from number of systems impacted to the current value of those systems or an estimated value of damage to them (or repair/replacement costs associated with damage/ destruction).

Irrigated Acreage in Affected Areas of Florida



Figure 5. Irrigated acreage in areas of Florida affected by strong tropical storm (TS2) or hurricane (Cat. 2 or 3) conditions by wind speed zone.

Source: Data on irrigated land acreages come from the FDACS FSAID ILG (https://www.fdacs.gov/Agriculture-Industry/Water/Agricultural-Water-Supply-Planning) and geospatial data of wind swath for Hurricane Idalia are derived from products published by the NOAA NHC (https://www.nhc.noaa.gov/gis/).

UF/IFAS Agricultural Damage Assessment Survey for Hurricane Idalia

As the currently available baseline data do not support statewide assessments that quantify damages to infrastructure, the UF/IFAS Agricultural Damage Assessment Survey for Hurricane Idalia is designed to have questions on infrastructure damages appear in a supplementary section of the online survey after collecting information relevant to the estimation of production losses. Respondents will only be asked about damages to infrastructure if they respond "yes" to a question asking if they are willing to share additional information beyond production losses. Therefore, not all survey respondents provide information on damages to infrastructure; however, agricultural producers that participated in the survey and completed the questions related to damages to infrastructure are reporting damage to or destruction of the following types of agricultural infrastructure: homes, greenhouses and other growing structures, livestock sheds, poultry houses, livestock watering points, storage structures, irrigation system structures, conservation structures, aquaculture structures and equipment, other farm buildings, farm equipment (tractors, implements, vehicles, greenhouse heating/cooling, etc.), fencing (exterior and interior), pallets, and perennial plantings.

ADDITIONAL CONSIDERATIONS

This report focuses on a rapid assessment of statewide production losses for the current season (calendar year 2023 or marketing year 2023-2024) for agricultural operations in Florida due to Hurricane Idalia. The value of the following categories of damages or losses are not included in these estimates and should be considered in addition to production losses suffered by impacted agricultural producers:

- Value of damages to agriculture-related infrastructure (including perennial plantings and lost/deceased animals that are used to produce animal products) that will need to be repaired or replaced.
- Value of stored inputs (seed, fertilizer, etc.) or stored harvested products that were damaged or destroyed.
- Expenses related to Hurricane Idalia-specific preparations ahead of the storm and expenses related to clean-up after the storm.
- Value of production losses that might carry over into calendar year 2024, marketing season 2024-2025, or beyond due to damages to agriculture-related infrastructure or other effects of the storm.
- Production losses for agricultural operations that specialize in post-harvest processing, packing, or distribution that might be impacted as a result of impacts to production agriculture operations, e.g., operations specializing in peanut drying, cotton ginning, seafood packaging and distribution, etc.
- Value of timber- or forestry-related losses, which are being assessed by the Florida Forest Service.
- Value of production losses to capture fisheries.
 Production loss estimates in this report do include shellfish and finfish aquaculture as these operations are considered agriculture. Capture fisheries might be covered by surveys conducted by other organizations.

It is also important to note that the estimates of production losses presented in the two scenarios (Low and High) represent the estimated total value of agriculture-related production losses due to Hurricane Idalia and do not account for the fact that some crop losses might be eligible for or covered by crop insurance or other risk management tools available to producers.

Finally, survey responses and conversations with Florida Cooperative Extension representatives and representatives of agriculture-related industry associations in the affected areas are also reporting the following impacts, which go beyond the acute, visible, and measurable impacts of the event:

- Continuing issues with debris (both trees and other non-natural debris) impeding their ability to access or secure all parts of their property, which in some cases is impeding production.
- Delayed planting or harvesting early prior to the storm to mitigate some storm-related impacts, which might impact timing to market, price, and/or quality.
- Reduced nutritional value of impacted grazing lands, which can affect weight of dairy and beef cattle, milk production in dairy cattle, and input costs for producers that will need to supplement with other types of feed.
- Continuing issues with reduced milk production in dairy cattle due to ongoing stress related to damages to buildings, equipment, housing, fencing, or cooling systems and loss of feed.
- Issues related to disease pressure on crops, which can be further impacted by missed or delayed applications of pesticide or fungicide as a result of the storm.
- Issues related to the availability and cost of insurance products or other risk-management options for crops or infrastructure prior to the storm as well as issues with access to funds to aid with cleanup and recovery, especially for crops or infrastructure that are not eligible for conventional insurance products.

Photo courtesy of survey respondent.



Estimated Agricultural Losses Resulting from Hurricane Idalia 11



fred.ifas.ufl.edu/economicimpactanalysis

UF/IFAS Food & Resource Economics Department PO Box 110240, Gainesville, FL Contact: **ccourt@ufl.edu**; Telephone: 352-294-7675

An Equal Opportunity Institution.