



AEM's 2025

Agricultural Weather Challenges Report

Profiling how farmers are feeling the pain and fighting back

Agricultural Weather Challenges Report

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Summary

AEM and Davis Instruments (an AEM brand) are dedicated to making it easy for farmers across the world to practice precision agriculture, make the best possible use of resources, and reclaim control of the bottom line in the face of variable and unpredictable weather conditions.

That's why, this winter, we surveyed subscribers to our AgInsider newsletter to better understand how farmers are feeling the pain of weather, what they're doing to fight back, and how we can support their evolving needs better as a provider of weather and in-field monitoring solutions.

We received submissions from 128 active farmers and growers across the globe. Nine different countries were represented in the survey, with the vast majority coming from the United States (105).

Survey respondents included



70

family farms



25

commercial farms



14

farm management
and services providers



13

homesteads



3

vertically integrated
vineyards



2

government
agriculture agency
representatives



1

sod grower

Generally, the survey uncovered that weather is the second biggest challenge facing today's farmers behind labor costs and availability. **Nearly half (48%)** of all respondents said weather cost them **more than \$10,000** in the last twelve months. Drought is the single biggest culprit, impacting more than 80% of farmers.

On the positive side, the survey marked a **7%** uptick in usage rates for on-site monitoring networks since our last survey in 2023, which supports the idea that precision agriculture is continuing to grow as a practice. In fact, many respondents expressed that they are eager to scale up their use of monitoring to continue making their farms more efficient with data.



Part 1: How farmers are feeling the pain of severe weather

Where do farmers rank weather and climate among their challenges?

We asked farmers to complete a scorecard ranking the six challenges below to profile how they view them comparatively in terms of scope or difficulty. We provided the same categories as our 2023 report in order to track the evolution of the space.

	2023			
	#1 Challenge	#2 Challenge	#3 Challenge	% in Top 3
Weather & Climate	40%	35%	11%	86%
Labor Cost/Availability	28%	18%	22%	68%
Fertilizer & Seed	14%	21%	23%	58%
Pests & Fungus	10%	17%	19%	46%
Worker Safety	5%	1%	10%	16%
Regulatory Compliance	5%	8%	14%	27%

	2025			
	#1 Challenge	#2 Challenge	#3 Challenge	% in Top 3
Weather & Climate	29%	31%	14%	74%
Labor Cost/Availability	40%	19%	14%	73%
Fertilizer & Seed	14%	19%	20%	53%
Pests & Fungus	8%	19%	23%	50%
Worker Safety	4%	7%	17%	28%
Regulatory Compliance	3%	5%	13%	21%





Key finding 1: Weather remains a consensus Top 2 challenge

- Weather and climate were still the most popular (or unpopular) choice for Top 3 challenges in 2025.
- **12%** fewer farmers put it in their Top 3 compared to 2023. That's likely due, at least in part, to their increased investment in weather technology (see page 10).

Key finding 2: Finding and affording workers is getting harder

- Farmers still agree on the same Top 3 challenges: **Weather, labor**, and **seed/fertilizer**.
- Labor and weather have effectively flip-flopped over the last two years, with finding and affording workers commanding the same 40% of the vote for number one challenge that weather/climate held in the previous survey.

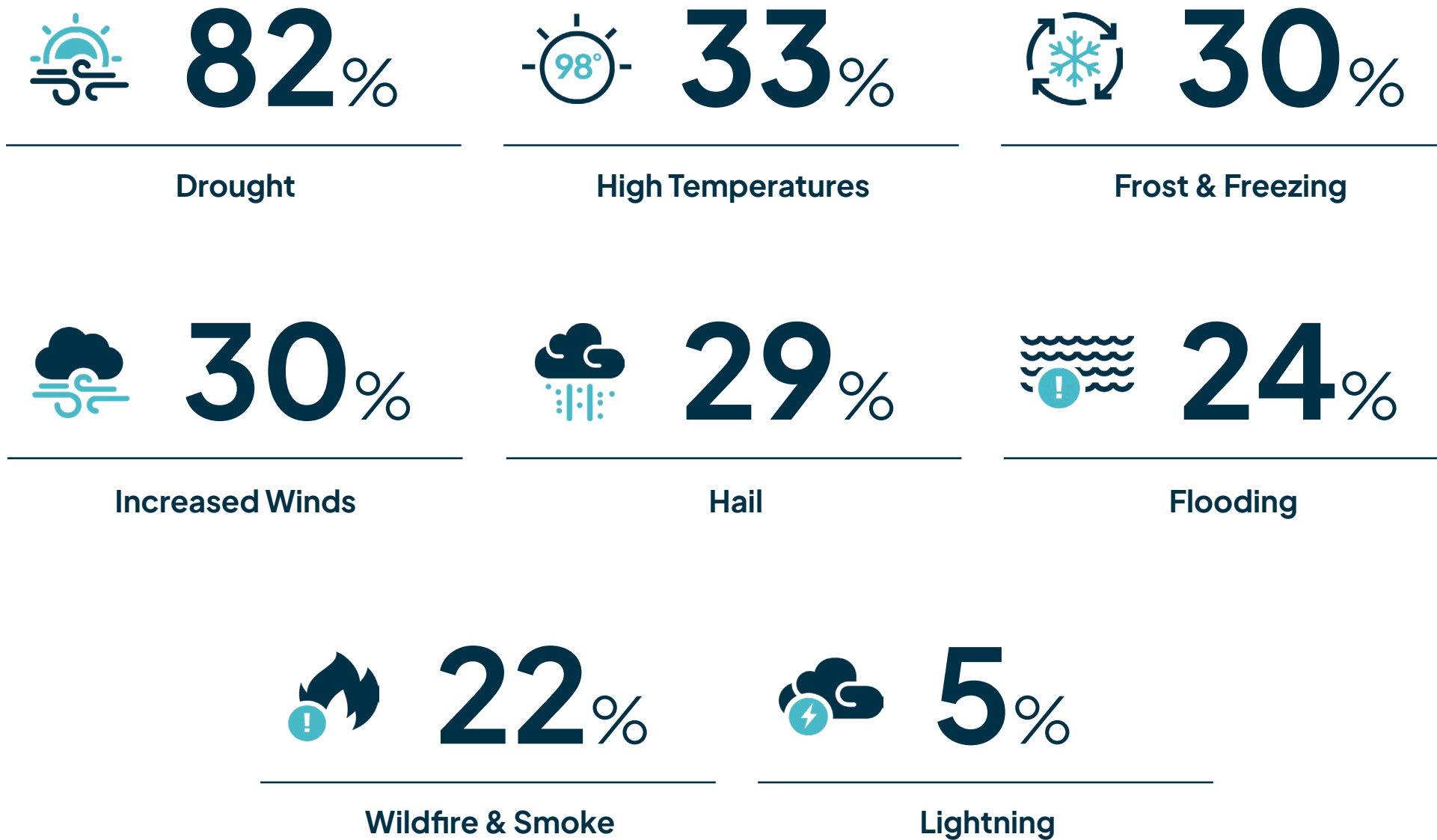
Key finding 3: Worker safety has risen quickly as a core challenge

- In our latest survey, **12%** more farmers put it in their Top 3 compared to 2023. That's the most growth of any of the six challenges we've been tracking.
- Safety intersects both weather/climate and labor relations, so farmers' two biggest challenges and fastest growing challenge are all interconnected.

How common are different weather challenges among farmers?

To get more specific about what weather challenges look like, we asked, “What kind of weather or climate challenges are affecting your operations?” Farmers were encouraged to **select all the challenges** they felt applied to their situation.

Drought was the most common response, by far, with more than four-in-five of our respondents saying it affects them.



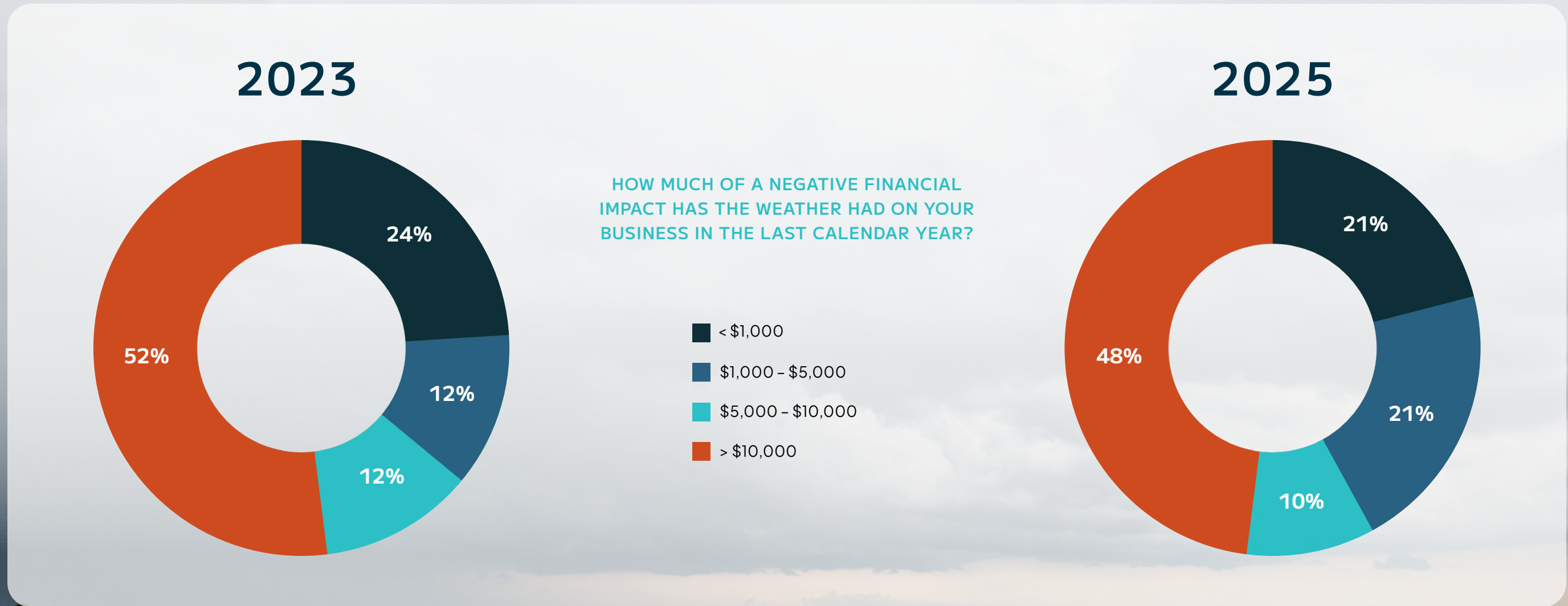
What do farmers say is their single biggest weather challenge?

- Drought: **48%**
- High Temperatures: **24%**
- Frost & Freezing: **9%**
- Wildfires & Smoke: **8%**
- Flooding: **6%**
- Hail: **3%**
- Increased Winds: **2%**
- Lightning: **0%**



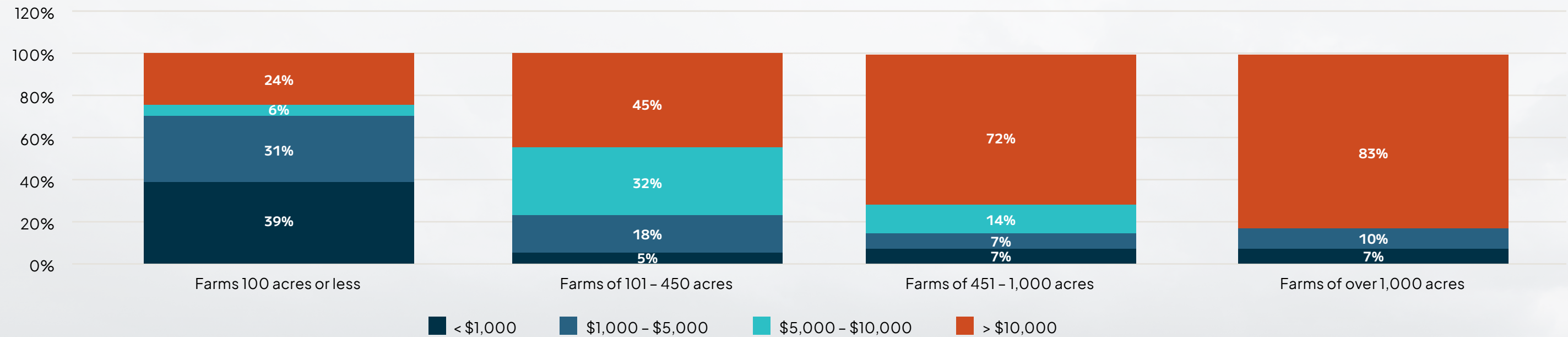
How much does weather cost the average farmer?

The most common response in the survey – representing just under half of all farmers we heard from – was **more than \$10,000**. The percentage of farmers losing less than \$1,000 fell, suggesting that more farmers are feeling the sting of significant weather impacts.



Diving deeper into how weather hurts the bottom line

WEATHER IMPACTS ON THE BOTTOM LINE (BY FARM SCALE 2025)



Key finding 1:

Big weather losses are part of the price of large-scale farming

- **88%** of all farmers with losses from weather under \$1,000 and 76% of those losing under \$5,000 farm less than 100 acres.
- For medium-sized operations, keeping the risk profile closer to that of a small farm and less like that of a large operation is key to success.

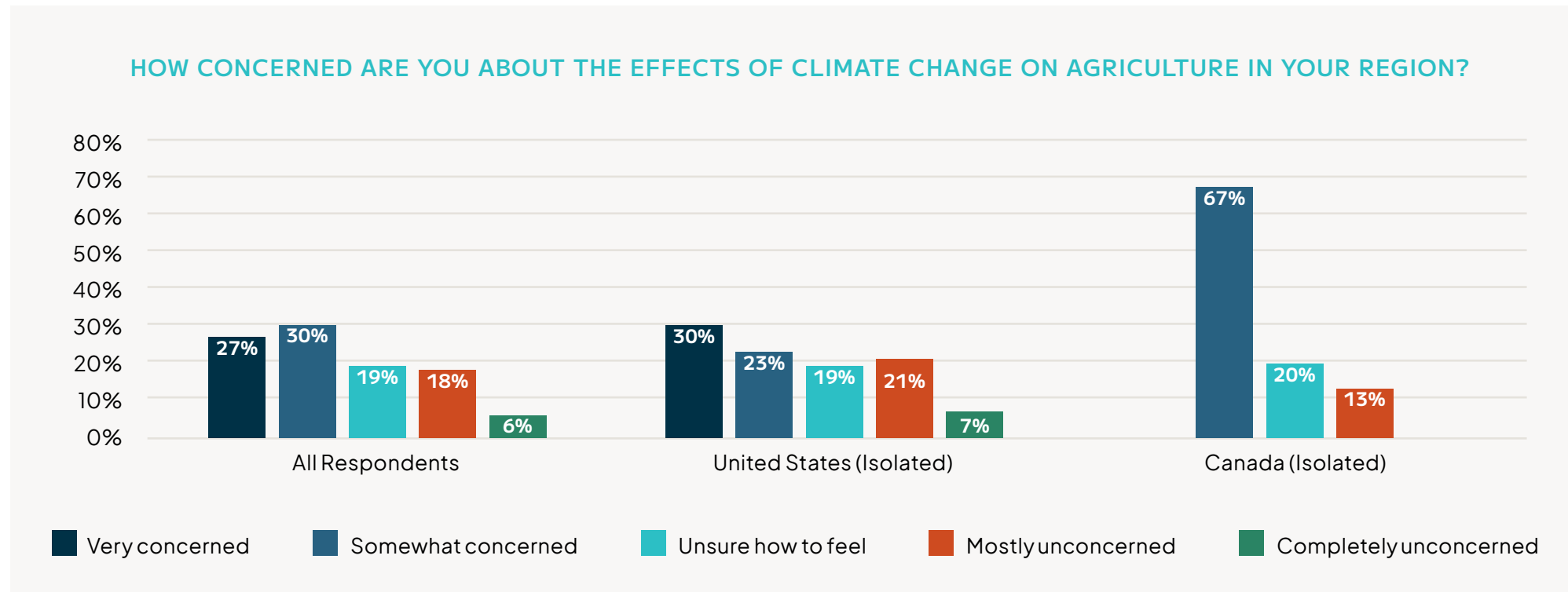
Key finding 2:

Costs are rising for small family farms too

- The number of <100-acre farms reporting losses over \$1,000 grew 4% between the 2023 and 2025 surveys, climbing over **60%**.
- These numbers show it's getting progressively harder to remain unscathed in the face of weather.

How worried are farmers about climate change right now?

Since weather and climate are closely connected, we asked survey respondents:

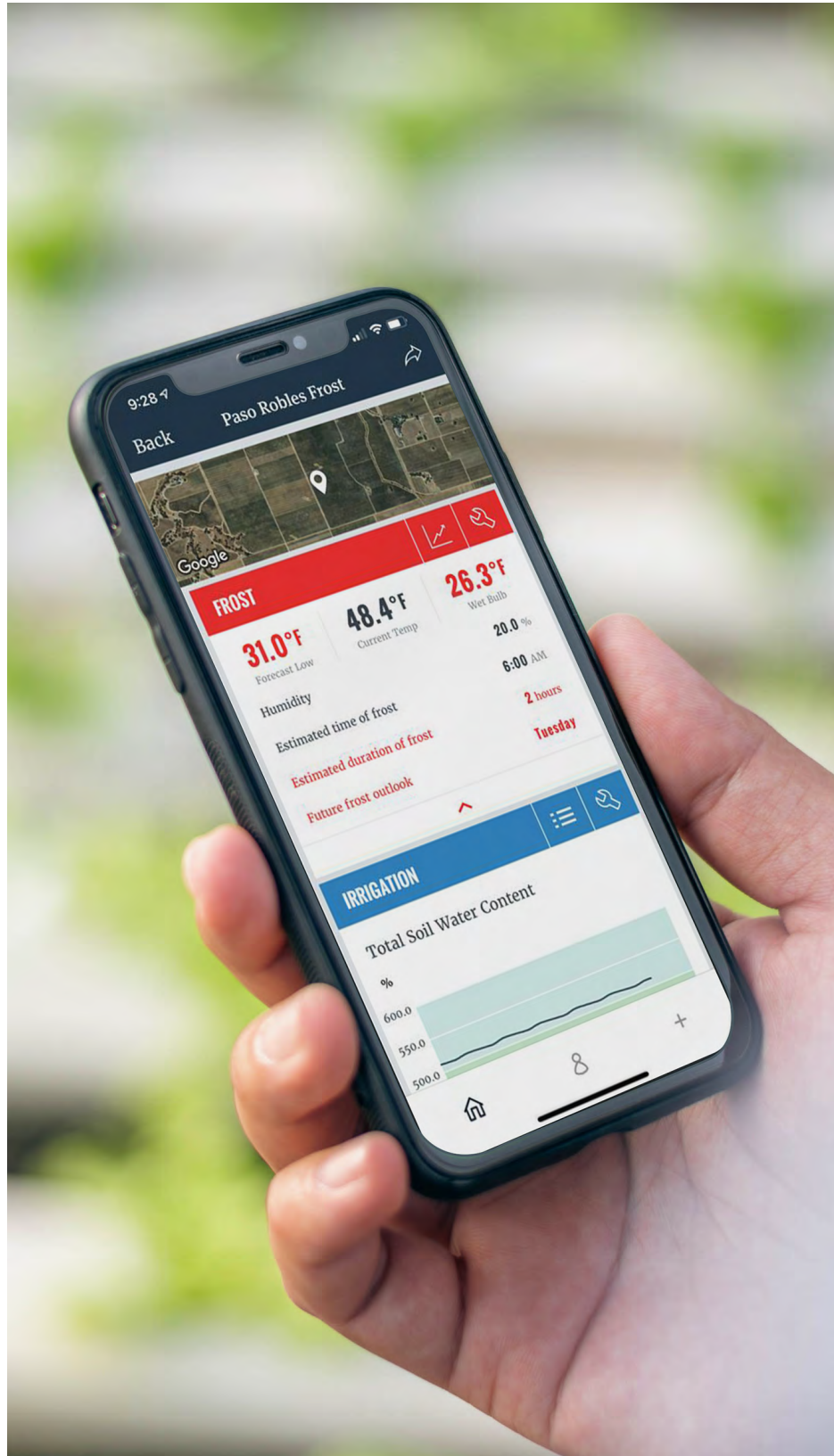


Comparing these results against our 2023 survey, it appears climate concerns among farmers are at a slightly lower level than two years ago. Our latest survey shows that **57%** of all respondents are concerned about how climate change is impacting agriculture compared to 62% in 2023.

That change is certainly reflected in the responses from the United States. Currently, around **53%** of American farmers are concerned about climate change, compared to 59% in 2023.

On the other hand, our findings suggest attitudes around climate seem to be shifting in the other direction among farmers in Canada. In 2023, just one third of Canadian farmers said they were concerned about climate's impact on agriculture. This time, two-thirds of Canadian participants indicated they are at least somewhat concerned, while just 13% express being mostly or completely unconcerned.

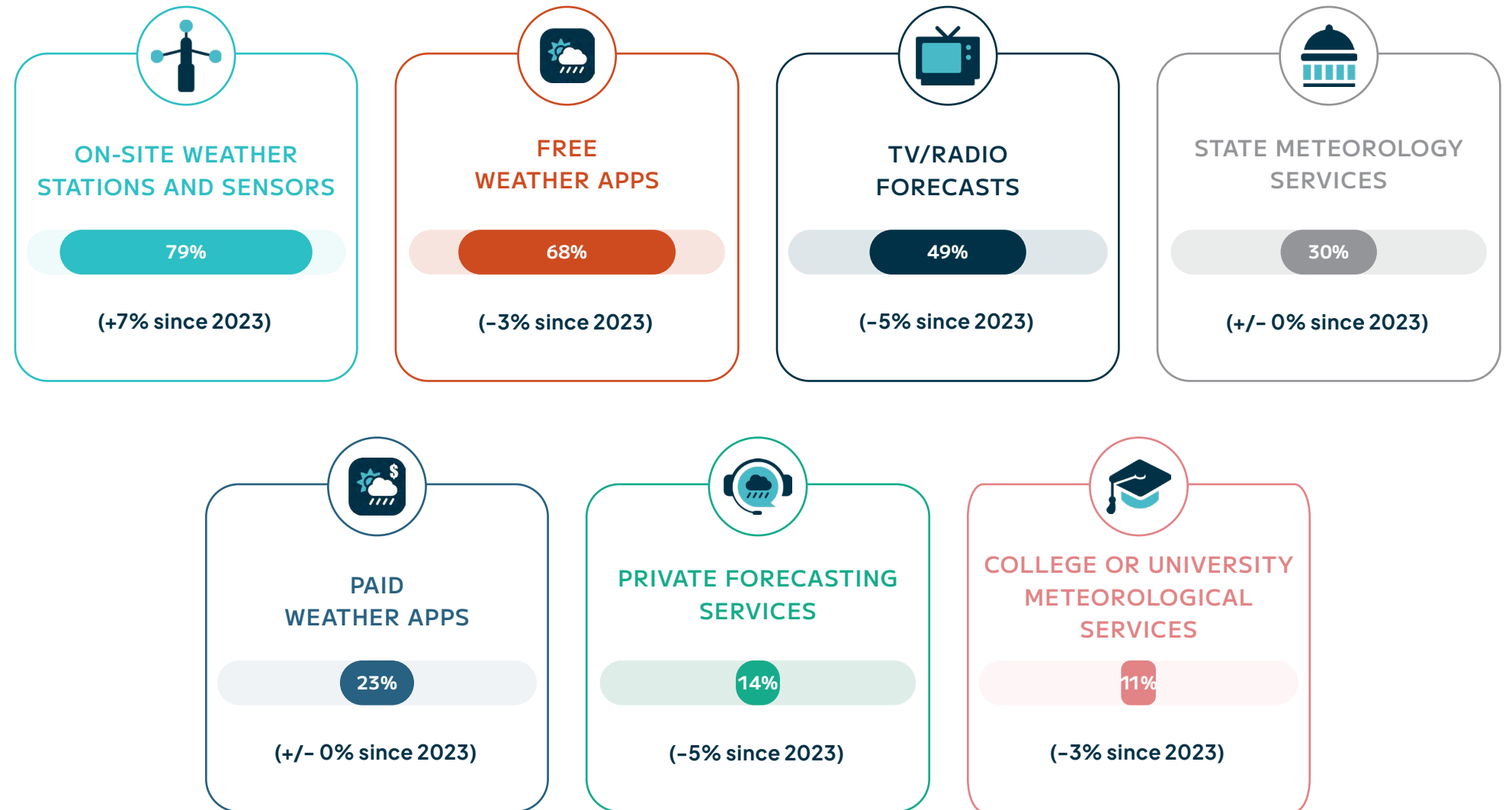




Part 2: How farmers are fighting back against severe weather

How are farmers getting their weather information?

Fighting back against weather requires data-powered decision making. That's why we wanted to profile where farmers are getting their weather data. Here are the usage rates for different weather intelligence sources among farmers and how their usage is trending. (Farmers were encouraged to select all the tools they were using.)



Key insight 1:
In-field monitoring is becoming more common

The survey results indicate that the adoption of modern in-field monitoring is growing. Weather stations and sensors are increasingly common, and the number of farmers who state they don't use environmental monitoring data dropped from 19% in 2023 to **15%** in our latest survey. This may be one of the reasons why farmers are feeling less challenged by weather, compared to two years ago.

Key insight 2:
Traditional weather sources aren't cutting it anymore

Our survey showed a slight decline across the board in the use of legacy forecasting systems (traditional TV/radio broadcasts, free weather apps, and university meteorological services). Farmers are seeking more precise, accurate information that's tailored to their needs and operation, not looking for a general forecast.

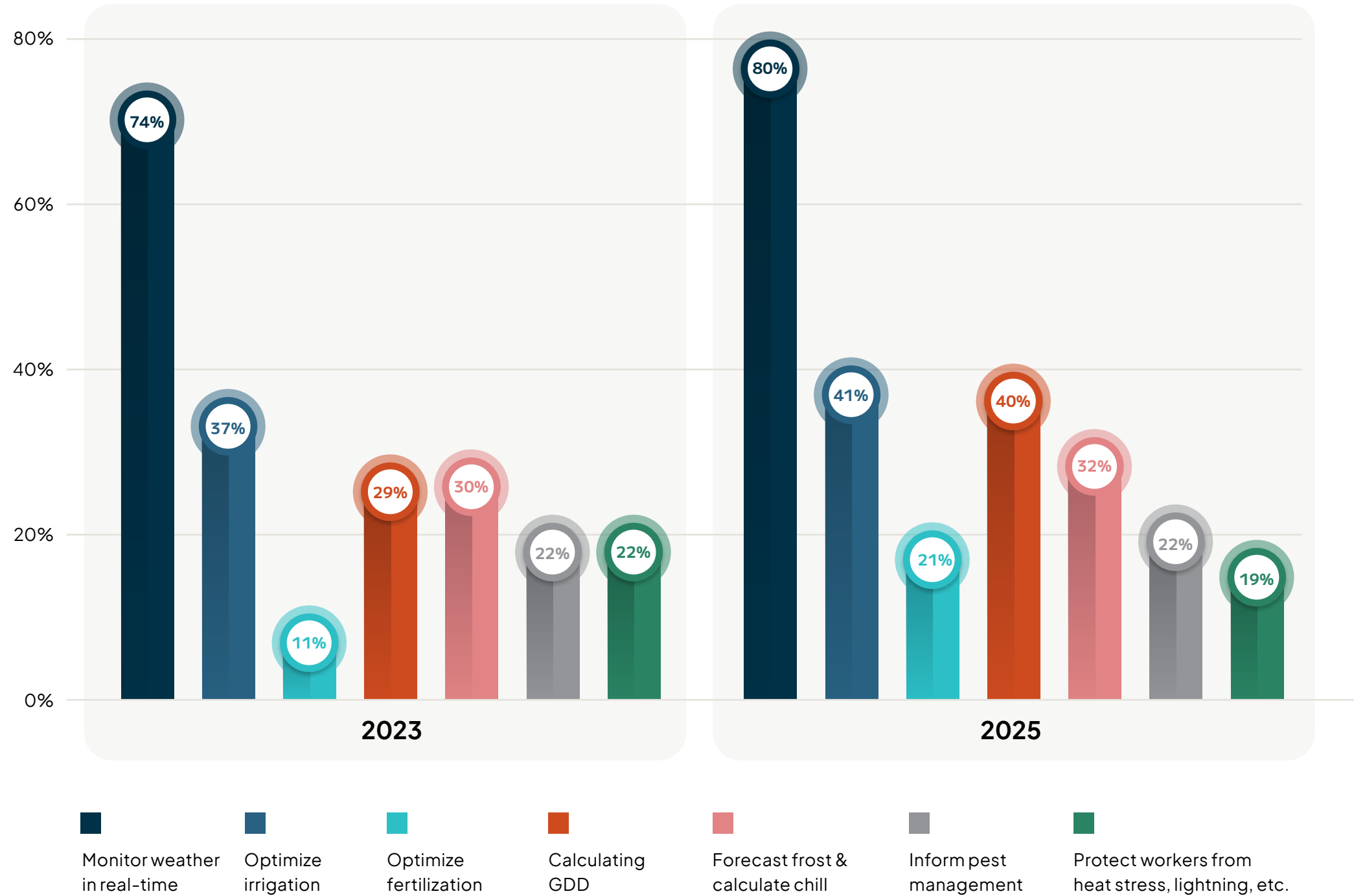


How farmers are getting more out of in-field monitoring

Our survey demonstrated that farmers aren't just buying more weather stations, they're getting more out of them too. Since 2023, we've seen an increase in weather data usage across the board as an increasing number of growers embrace precision agriculture.



ARE YOU USING LOCAL WEATHER DATA FROM YOUR STATIONS AND SENSORS TO...





Key finding 1:

More farmers are using data to get them to a strong harvest

- **10%** more farmers are using data for Growing Degree Day (GDD) calculations and timing fertilization compared to 2023.
- Data-powered irrigation optimization has measurably grown as a practice as well.

Key finding 2:

Weather monitoring is still the most common use case by far

- Farmers still use weather stations and sensors for their primary use case (weather monitoring) at nearly twice the rate they use them for anything else.
- This illustrates how precision agriculture is growing, as users get started at the weather level and add additional use cases as their comfort level increases.

Key finding 3:

Under-utilization of data for safety is misaligned with the growing challenge

- The only use case for weather data that saw a decrease in our most recent survey was worker safety.
- Given that the survey also identified safety as a rapidly growing challenge, farmers require more education on how to help turn weather data into safer operations.

What farmers need to take the next step forward

What farmers say they want

In order to capture authentic feedback from farmers about what they feel like they need in order to take the next step in precision agriculture, we asked:

WHAT'S A WEATHER-RELATED PRODUCT, SERVICE, OR TOOL YOU'RE NOT CURRENTLY USING THAT YOU FEEL COULD MAKE A DIFFERENCE FOR YOUR OPERATIONS? (IT COULD BE SOMETHING YOU'RE AWARE OF OTHERS USING BUT HAVEN'T TRIED YET OR A HYPOTHETICAL TOOL YOU WISH WAS AVAILABLE.)

There were five consistent themes that emerged among the responses:



SOIL MOISTURE AND TEMPERATURE MONITORING

- Soil monitoring was by far the most common response, with approximately **30%** of all farmers who responded to our survey calling it out as something they'd like to try.
- It's a logical next step for growers with weather stations, especially in the face of drought.



EVAPOTRANSPIRATION AND LEAF MOISTURE

- Like soil monitoring, ET and moisture monitoring are a great next step for farmers who want to irrigate with more precision. It was the second most frequently mentioned topic.
- Several farmers even went to the trouble of typing out "evapotranspiration," which shows it's something they've been considering a lot.



ACCURATE FORECASTS, ESPECIALLY FOR RAINFALL

- Many farmers mentioned they were looking for better long- and short-range weather forecasting to inform their operational planning.
- A number of respondents specifically mentioned wanting a forecasting tool that would push them automated alerts to stay on top of emerging situations.



AIR QUALITY INFORMATION

- In areas where wildfires are prevalent, air quality monitoring is essential for worker safety and protecting crop quality (especially for grapes).
- Some farmers were curious about how they could add air quality monitoring to their existing weather stations.



FUNGUS FORECASTS AND DETECTION

- Multiple people said it would be useful to have a forecasting tool that included fungus warnings/alerts alongside other weather information. That aligns with the survey's finding that pests and fungus are a growing challenge compared to two years ago
- Several farmers are curious about the possibility of real-time fungus spore monitoring using in-field sensors.

Key takeaways



Farmers currently see weather as one of their top two challenges, alongside labor costs and availability. Over the last two years, labor has claimed weather's place as the most farmers' #1 challenge. With that said, almost half of farmers around the world lose more than \$10,000 to weather each year.



Concern over climate change seems to be decreasing somewhat among growers in the U.S., although the opposite appears to be true in Canada.



More farmers are using environmental monitoring data to make decisions compared to two years ago, and that number will continue to grow. More farms are adding weather stations, and many of those that have been using weather stations for a while are looking to expand their monitoring capabilities.



Improved soil and moisture monitoring is currently the most common wish for efficiency-minded farmers, which makes sense, given that drought is today's single biggest challenge.

Recommendations

Based on the results of the survey, farmers seem to have a strong understanding of what they need to thrive in today's environment. All the common wants from the survey – from soil and ET monitoring to air quality alerts – are completely achievable goals with today's technology.

We recommend **EnviroMonitor by Davis Instruments** for any farmers looking to level up their approach to data-powered agriculture. It's a reliable in-field monitoring system specifically designed to help farmers tackle today's critical challenges, from precision irrigation to proactive pest management and air quality monitoring. Wherever you are in your journey – whether it's getting your first weather station, adding sensors, or turning data into action – EnviroMonitor can help you get to the next step.

To take your next step toward better harvests, better use of resources, and a better bottom line...

- **Make a priority list of monitoring goals or data you wish you had**
- **Get your copy of the [Davis Agricultural Weather Solution Buying Guide](#)**
- **[Talk to an AEM agriculture specialist](#) about scaling monitoring hardware to your farm**



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