FINRES

THE NEW NORMAL: FRENCH AGRICULTURE IN AN ERA OF CLIMATE EXTREMES

KEY FINDINGS

France experienced one of its wettest agricultural seasons on record in 2024, severely impacting crop yields, especially wheat.

The total precipitation in the agricultural season was 45% above the reference normal for 1991-2020, making it the fourth wettest in modern times.

Excess precipitation leads to lower yields than even the low yields associated with years of drought in the regions[1] producing most of France's wheat. As, a consequence, 2024 will be one of the worst harvests in modern times: wheat production dropped by 26% compared to the average.

By 2050, the likelihood of farmers facing similar conditions of excess precipitation is projected to increase by 20% to 30% compared to the first twenty years of the century, and this trend is expected to continue with climate change.

Adaptation measures like drainage systems could halve losses related to excess precipitation.

Each euro invested in adaptation would lead to a profit of 1.40 euros. For capital expenditure of around 1,400 million, the benefits of adaptation could result in an improvement in yields and therefore income valued at around 600 million euros per year and with total macroeconomic benefits reaching 1,900 million euros.

finres has developed AgHorizon for farmers: the application provides location-specific climate data, yield predictions, and adaptation recommendations to help them make informed decisions in the face of climate change.

FOREWORD

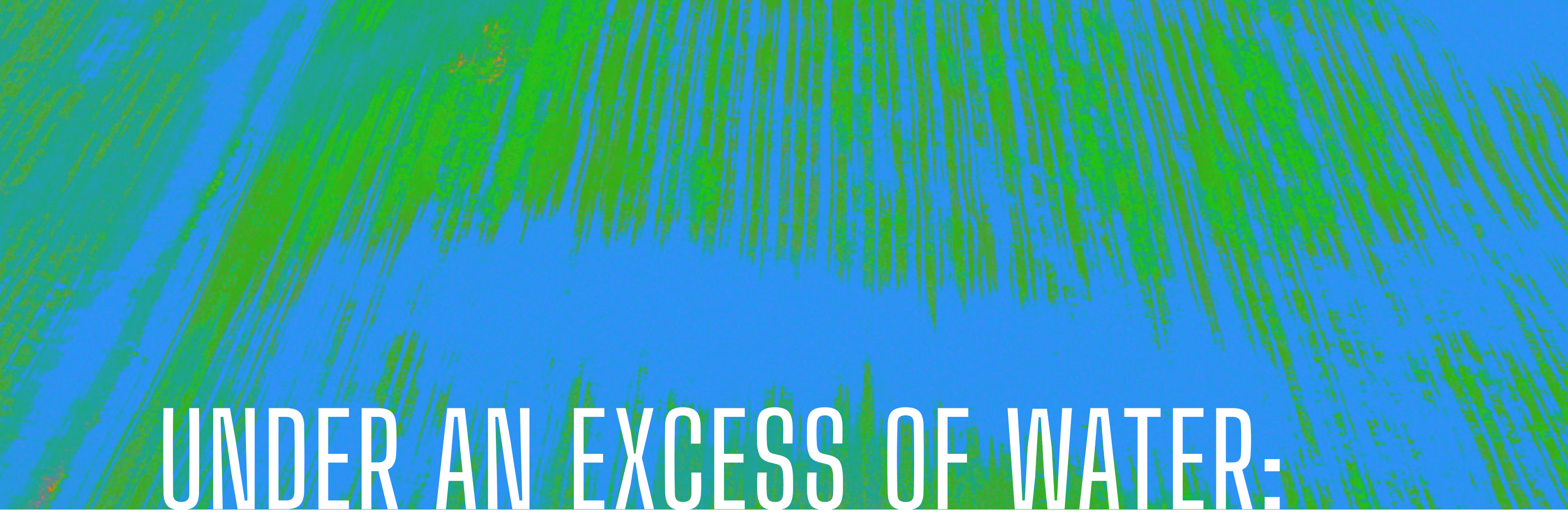
Everyone who cares about the future of farming should pay attention to the 2024 harvest in France. While poor harvests are nothing new, they're becoming more frequent — and this trend is happening worldwide. What we once considered "extreme" weather is now becoming the norm, and today's extremes are even more intense. Farmers stand on the front line of this changing climate, and they need more support than ever.

This is why finres developed the AgHorizon application and undertook this analysis. Farmers are among the most entrepreneurial and resilient people you will ever meet. Yet without clear insights into how the shifting climate will impact their operations, they are essentially navigating into a storm without a map.

Finres was founded to bridge the gap between advanced climate science and practical solutions to make farming more resilient. AgHorizon was developed with this mission in mind — to equip farmers with the critical data they need to invest confidently in their futures. We hope the analysis in this report contributes to ongoing discussions about how agriculture is changing, not just in France but worldwide. Above all, we hope this report, alongside the data from AgHorizon, serves those farmers who continue to produce these essential goods we all depend on, despite increasing volatility. For all of us, their success is crucial.

Florent Baarsch
Founder & CEO

TABLE OF CONTENTS



UNDER AN EXCESS OF WATER: AN ANALYSIS OF THE 2024 GROWING SEASON

The opening ceremony of the Olympic Games was famously wet. An excess of water was not restricted to athletes and performers on one summer evening, however. Farmers across France were also battling the wet weather throughout the year. The result: this year's harvest will be amongst the lowest this century.

This has been caused largely by one of the wettest agricultural seasons ever experienced. Data published in September from Agreste, the statistics service of the Ministry of Agriculture, show that soft wheat production will drop by almost 26% compared to the average of the last five harvests.[2] To put this into context:

- Wheat production is estimated at 25.8 million tonnes, down 26.3% compared to 2023 and down 25.5% compared to the average over the last five years.
- The yield is estimated at 61.5 q/ha, 16.7% lower than that of 2023.
- Due to the weather conditions of fall and winter 2023, wheat was also grown in fewer fields across farms in France this year (down 11.8% compared to 2023), meaning 2024 will be the smallest harvest of straw cereals in at least the last 38 years.

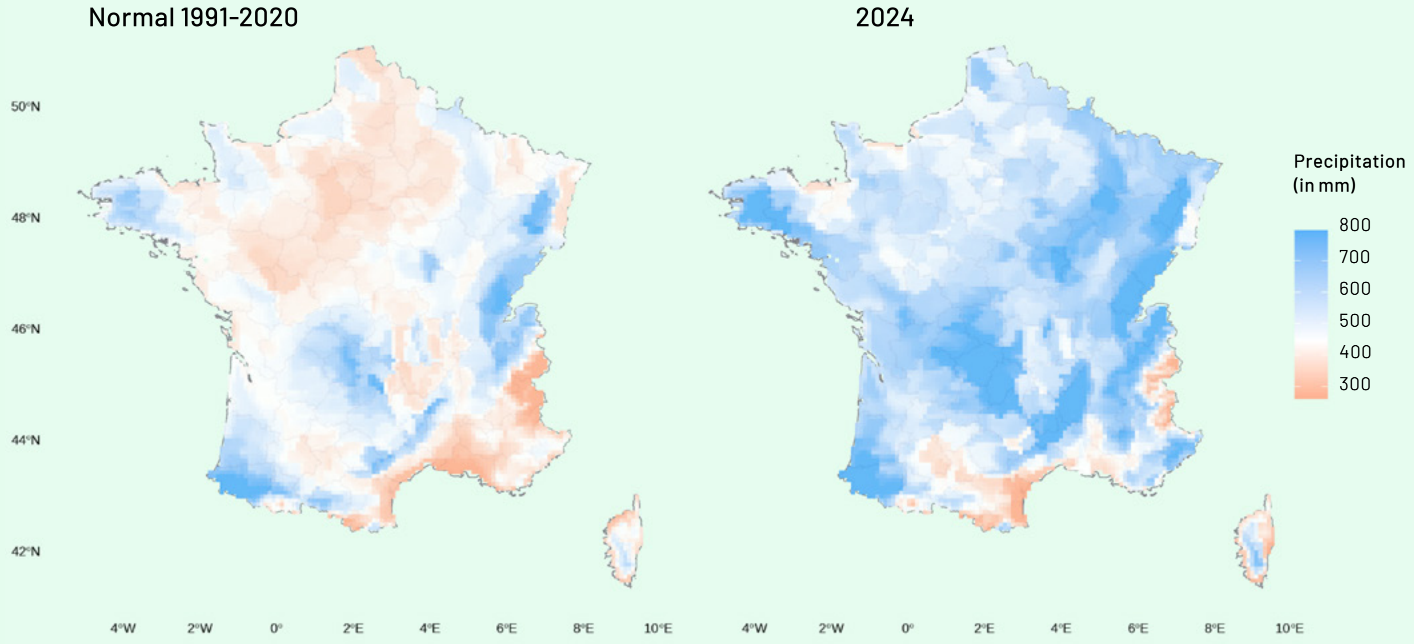
Wheat is the most grown crop in France, constituting almost half of the total area of all cereal crops grown. Crops constitute approximately two-thirds of agricultural output in France.[3] While the abnormal conditions did benefit a few crops this year, the effect on wheat is largely representative of the effect on other crops:

- Barley production is expected to be 10.0 million tonnes, down 18.2% compared to 2023 and down 15.2% compared to the average over the last five years.
- Oats production is down 18.7% compared to the average over the last five years.

- One bright spot to be confirmed once the harvest is finished: grain corn production (including seeds) is expected to be 11.4% higher than 2023 and 8.2% higher than the average. This increase is partially attributable to an increase in the surface area on which grain corn was grown this year (up 22.8% compared to last year).

The historically low yields have been caused by previously unusual weather conditions in the first half of the year. According to an analysis by **finres** of data published by Météo-France, the total precipitation in the agricultural season in 2024 was 45% above the reference normal for the period 1991-2020 (see **FIGURE 1**), and the third wettest ever in modern times (after 2001 and 2016).

FIGURE 1 **Cumulative precipitation 45% above normal in 2024**



Average cumulative precipitation between the months of January and July over the period 1991-2020 (left) compared to the cumulative precipitation in 2024 (right).

Analysis: finres *Data:* Météo-France

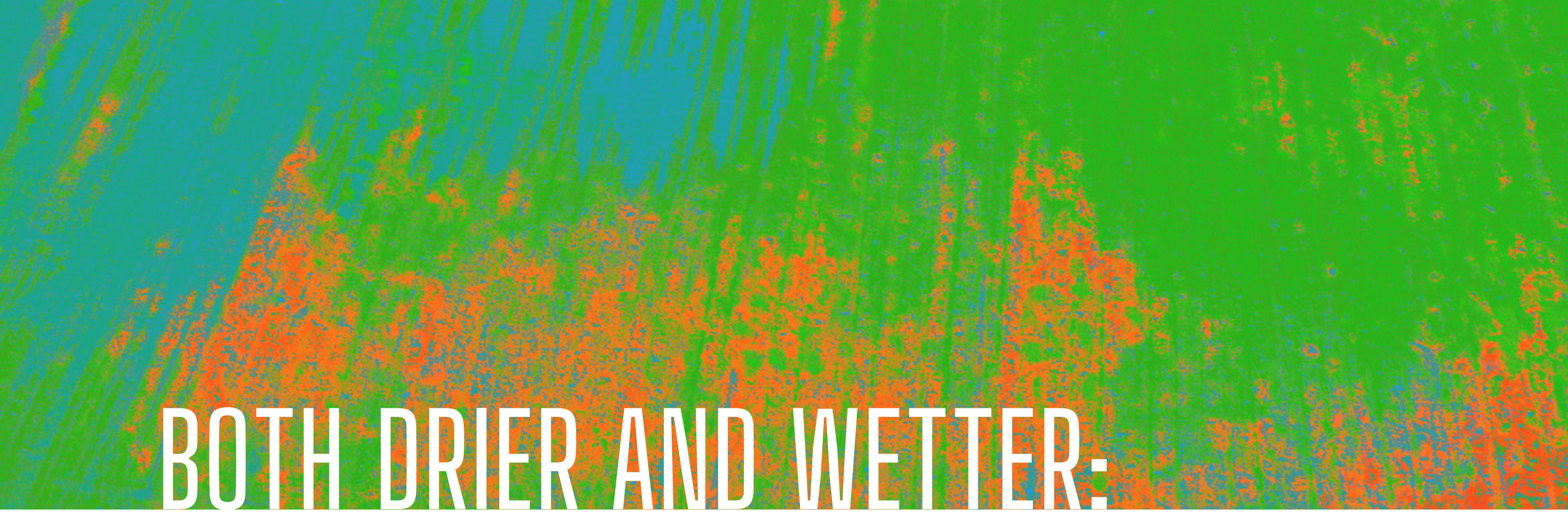
On average for France, the total precipitation over the first seven months of 2024 was 612 mm. The rain has a direct effect on yields, but so too do the clouds blocking the sun from reaching the crops, limiting the photosynthetic activity of the plant. The agricultural season in 2024 experienced a deficit of sunshine and therefore radiation of around 20% on a national scale and of 30% for the north-east of France. Over the last 30 years, this was the second least sunny January to July, only after 2016, with devastating impacts on the amount of energy reaching and supporting crop growth.

Most wheat in France is grown in the north-east, in regions of the country with previously excellent weather and agronomic conditions for this critical crop. Six regions, which combined produce over 60% of French wheat were particularly affected by excess rain. Compared to the climate reference period of the twenty years at the turn of the century (2001-2020), these six regions experienced between 22% and 54% more total precipitation:

- **Centre Val de Loire:** +54% (third wettest year since 1991)
- **Grand Est:** +49% (fourth wettest year since 1991)
- **Île-de-France:** +46% (third wettest year since 1991)
- **Pays de la Loire:** +46% (second wettest year since 1991)
- **Hauts-de-France:** +35% (third wettest year since 1991)
- **Normandie:** +22% (seventh wettest year since 1991)

As excess precipitation correlates with low sunshine, these same wheat producing regions therefore experienced a deficit of plant-nourishing radiation, ranging from 9% lower than 2001-2020 average in Normandie to 20% lower in Île-de-France.

These adverse conditions over the main part of the wheat growing season spelled catastrophe for farmers. This year's weather, while bad, is becoming more frequent due to the impacts of climate change. Farmers are having to face greater volatility in the weather, with years with more extreme precipitation and less sunlight, with dramatic impacts on their yields.



BOTH DRIER AND WETTER: CLIMATE CHANGE IN FRANCE

Over the last two decades, French wheat farmers have faced precipitation both extremely low (like 2003) and extremely high (like 2016 or 2024) affecting their yield and overall production.

Why is climate change, or "global warming" as it is often referred to, causing this extra rain? Headlines relating to climate change mostly refer to small changes in the temperature, for example "2 degrees Celsius of warming". This is an important scientific and political threshold. The historic Paris Agreement refers to "keeping global temperatures well below 2°C above pre-industrial times while pursuing means to limit the increase to 1.5°C".

Simple numbers provide easily understandable benchmarks. For example, the latest assessment by the World Meteorological Organization confirmed that 2023 was the warmest year on record, with the global average temperature at 1.45°C above the pre-industrial baseline.[4]

But small averages hide big impacts. This seemingly small increase of global-mean temperatures is already leading to outsized changes in global weather patterns. At a simple level, as the world warms, more water exists as vapor in the atmosphere. Scientists have detailed how these apparently marginal increases in overall temperatures lead to more water being carried in the atmosphere, with significant consequences for our weather, the amount of rain that falls, and the intensity of extreme weather. Look beyond the small increases in average temperatures, and climate change means more extreme and volatile weather. This has resulted in historically wet years, often followed by years of drought conditions with too little precipitation.

Climate change is increasing the volatility of the weather leading to conditions like those seen in 2016 and this year. The impact of climate change on agriculture in France requires us to look beyond the average effect on the temperature and at the increased variability of new extremes which farmers will have to navigate.

THE EFFECT OF TOO MUCH RAIN: EXCESS PRECIPITATION LEADING TO YIELD REDUCTIONS

The effect of droughts on agricultural production are well known. These conditions also impact yield and require different agricultural responses compared to periods of heavy rain. While there has been high profile focus on the need for irrigation and other water management systems to manage the years in which there is less rain, the reality of climate change for French agriculture is increasing volatility and unpredictable swings between years of drought and deluge. The recent experiences of 2016 and 2024 demonstrate the importance also of excess precipitation.

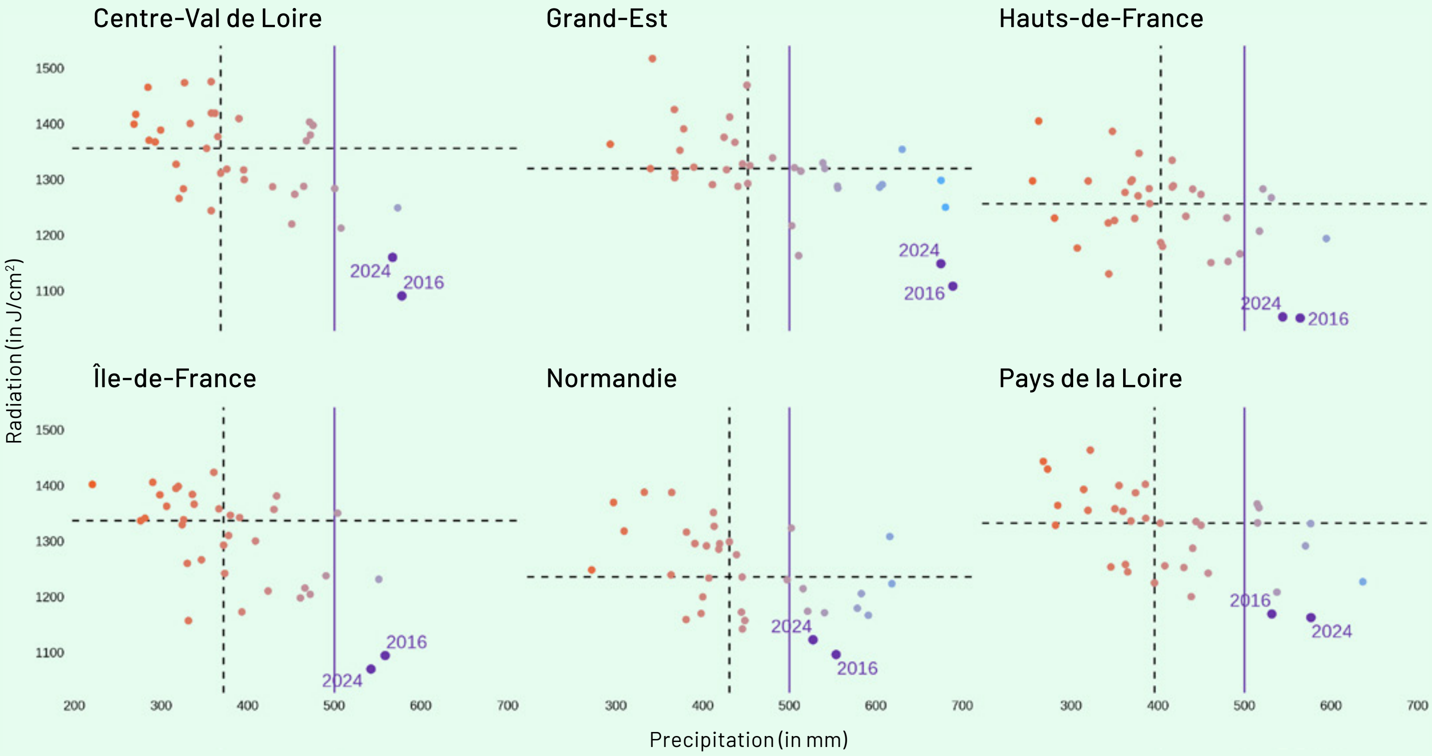
As shown in **FIGURE 2**, these years saw a combination of extremely high amounts of rain and low amounts of sunshine, which together lead to low yields. For the six wheat-growing regions in North-Eastern France, these two years were the wettest (as shown horizontally along the x-axis) and least sunny (as shown by being low vertically on the y-axis).

Analysis from **finres** uses the examples of 2016 and 2024 to show the impact of the excess precipitation on yields. When total rainfall within a region exceeds 500mm over the first seven months of the year (the growing season of wheat), yields can be seen to drop significantly. **FIGURE 3** shows the effect of cumulative precipitation on wheat yield in the six wheat producing regions studied as part of this analysis.

Between 2019 and 2023, departments within these wheat-growing regions showcase the highest yields in France, going up to 92 q/ha in le Nord (against a national average of 73 q/ha). These yield levels, especially those obtained in the Hauts-de-France region, reflect optimal precipitation and temperature conditions and effective farmer practices, allowing for wheat to thrive.

Excess precipitation beyond the "normal" levels hence leads to steep decreases in wheat yields. After total rainfall in the first seven months of the year exceeds 500mm, yield decreases range from around 25% in Hauts-de-France to 40% in Île-de-France.

FIGURE 2 An exceptionally wet year with little sun

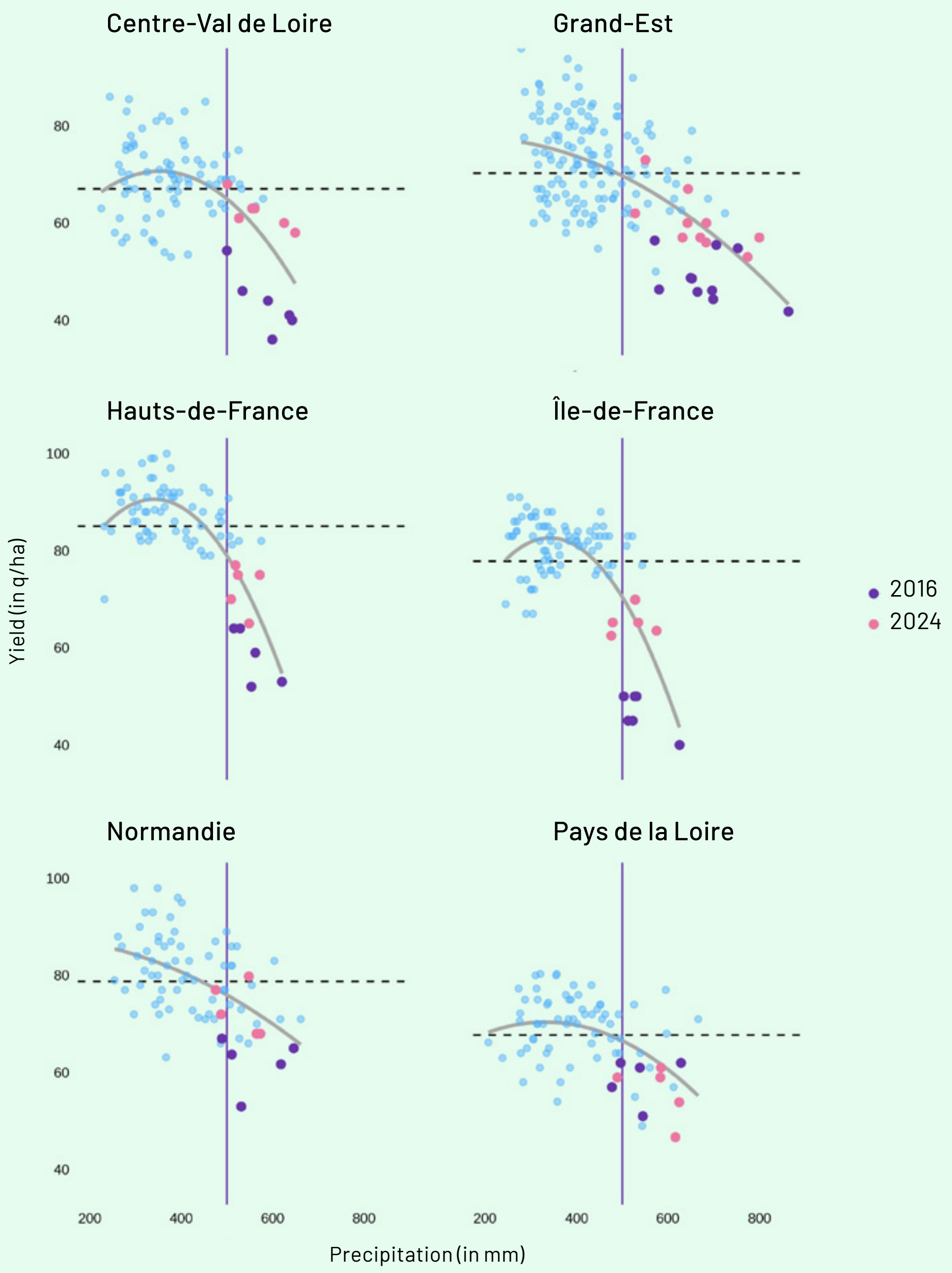


Cumulative precipitation and radiation between January and July over the period 1990-2024. The vertical and horizontal dotted lines represent the median precipitation and radiation by region. The purple vertical line indicates the threshold of 500mm of precipitation beyond which yields decrease rapidly.

Analysis: finres *Data:* Météo-France

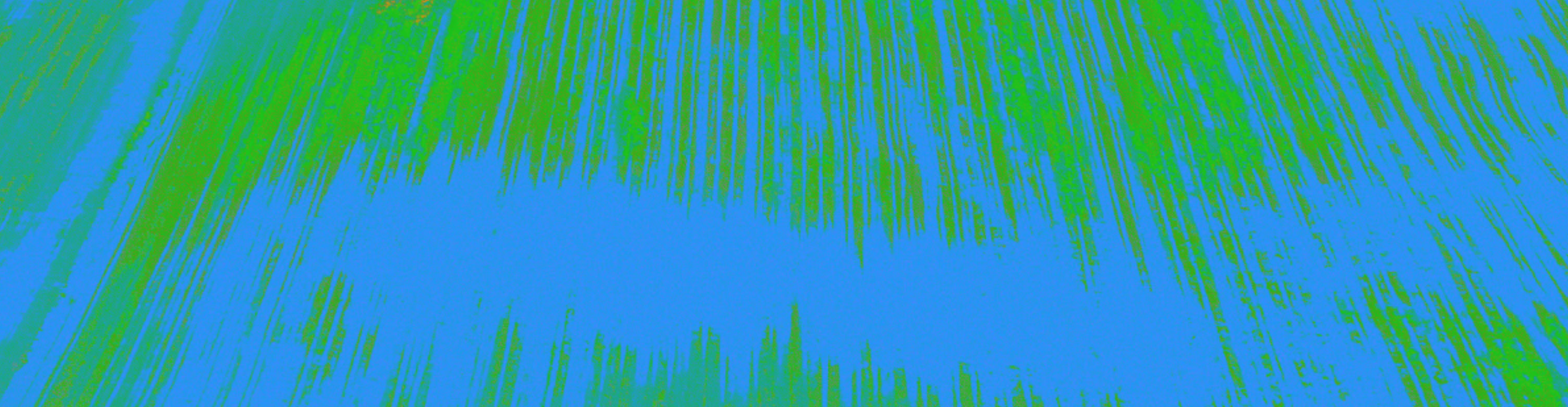
In other words, this more extreme weather has significant impacts for farmers. Excessive rainfall can water-log soil, provide more favourable conditions for fungal diseases, delay planting, and impede field access for farmers, all of which directly impacts the ability to sow, grow, and harvest key crops such as wheat. The corresponding lower amount of incoming sunlight reduces photosynthesis rates, slowing wheat growth and development, which in turn leads to weaker plants and delayed maturation.

FIGURE 3 Excess water harms wheat yields



Wheat yield by region as a function of cumulative precipitation between January and July over the period 2010-2024. The purple vertical line indicates the threshold of 500mm of precipitation beyond which yields decrease rapidly. The blue dots represent the departments in each region in years other than 2016 and 2024.

Analysis: finres *Data:* Météo-France



MORE EXTREMELY WET YEARS: THE IMPACTS OF CLIMATE CHANGE

Weather has always been variable from one year to the next. This is not new. Farmers and the communities they feed have had to rely on good years balancing out the bad. But previous variability was largely predictable based on experience alone. Farmers knew what a 'bad' year was, and a one-in-a-hundred-year event was exactly that: once in a hundred years. This is now changing. The climate has changed and is continuing to change.

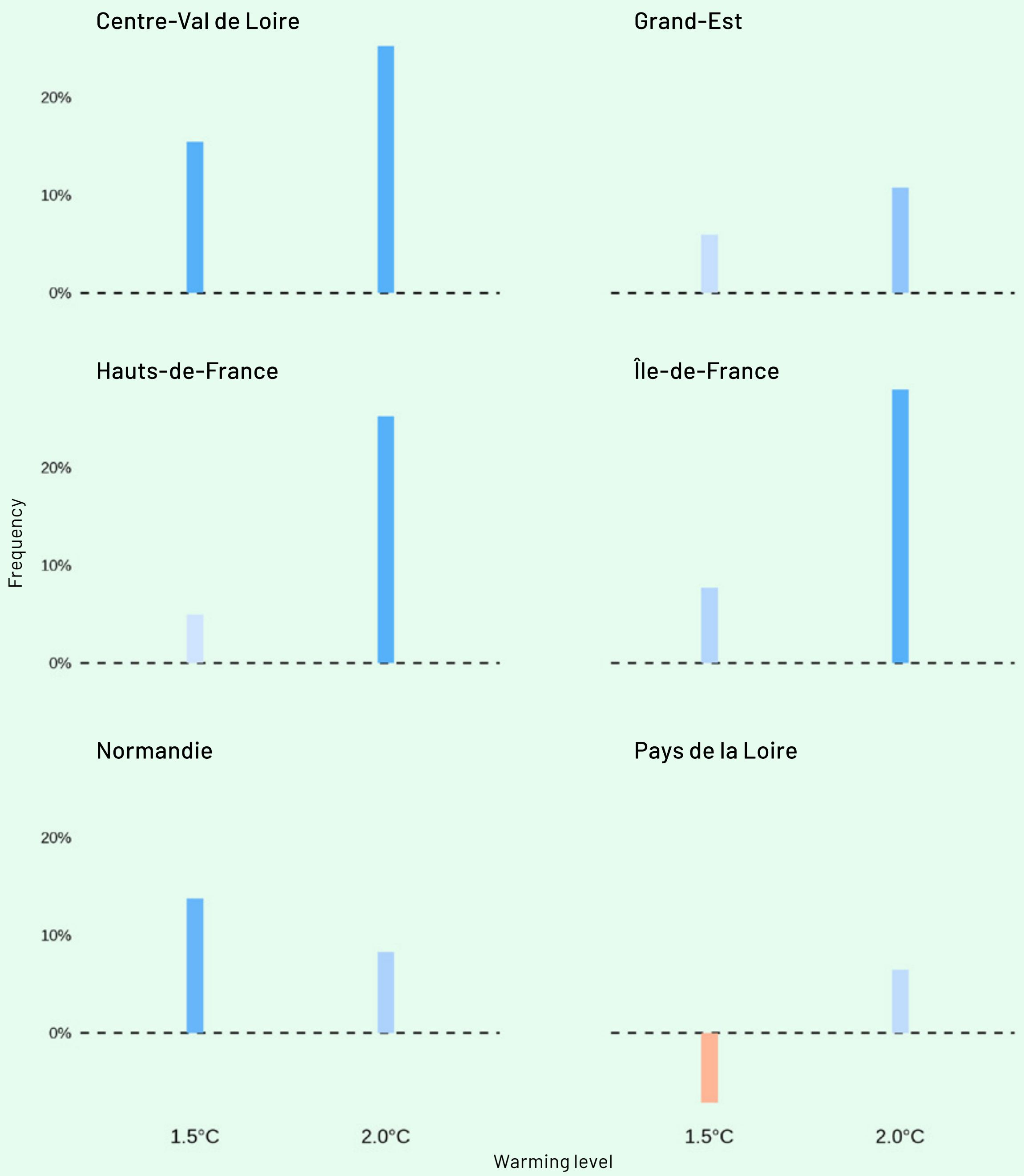
Due to climate change, farmers in France will face more wet years like 2016 and 2024. In the wheat-producing six regions assessed in this analysis, the probability of farmers facing such excess precipitation has increased by between 20% to 30% compared to the first twenty years of the century.

The 2016 wet agricultural season and poor harvest was called "extraordinary".[5] Yet just eight years later, 2024 witnessed another catastrophic harvest. Analysis from **finres** using the climate science data and models used by Météo-France, shows the increasing frequency with which these "extraordinary" years will re-occur, and become more ordinary.

FIGURE 4 shows the increased probability of a wet agricultural season, of more than 500mm total rainfall as experienced in 2016 and 2024, in the six main wheat-producing regions of France as the temperature increases to 1.5°C and 2.0°C. In Pays de Loire, the frequency of these excessively wet agricultural seasons may decrease in the short-term, but for all regions, the frequency increases over the medium to long term. **FIGURE 4** shows the increased probability at different warming levels: 1.5°C and 2°C, both compared to pre-industrial temperatures.

On the current trajectory of climate change, the world will experience a warming of 1.5°C around 2035 (period 2025-2044) and 2°C around 2050 (2040-2059). In France, this warming will be higher at 2.0°C and 2.7°C for the two periods mentioned above. With an average farmer aged approximately 50,[6] this cohort will experience the greater number of excessively wet agricultural seasons associated with 1.5°C of warming. A young farmer starting his career today will experience the increased number of excessively wet agricultural seasons associated with 2°C of warming.

FIGURE 4 **When the exceptionally wet of the past becomes the norm of the future**



Frequency of years in which the threshold of 500mm of cumulative precipitation during the months of January to July is exceeded for the reference period (2001-2020) and two warming horizons: 1.5 °C and 2.0 °C.

Analysis: finres *Data:* Météo-France

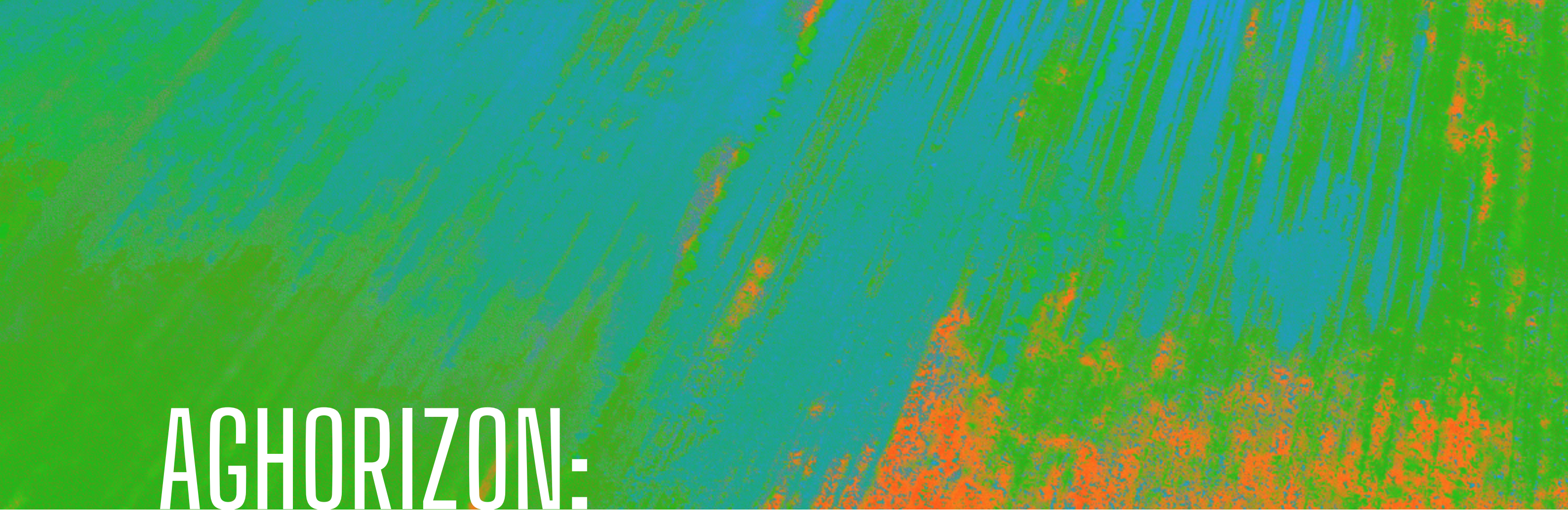
With a 20% to 30% increase in the frequency of excessively wet agricultural seasons in the future, wheat yield in the northern part of France could experience increased variability and potentially an overall downward trend if combined with an increased frequency of extremely hot and dry years as observed in 2003 or 2022. This increasing volatility in yields impedes investment and discourages new farmers from joining the profession. Such variability and the increased frequency of major losses could also have significant consequences on public finances as under current policies low yields caused by climate shocks are compensated through government-subsidized insurance and grant schemes.

While we cannot predict exactly when future poor harvests will occur, the increased probability of their recurrence, and the implication for farmers is stark. Analysis from **finres** on agriculture in France reinforces the research developed by other institutions globally,[7] showing that bad harvest years — marked by significantly reduced yields due to adverse weather — are set to become more frequent as climate change progresses.

In this context of a changing climate, the livelihood and wellbeing of farmers depends on being able to access adequate information on risks and how to mitigate them. This is the mission of **finres**. The following special focus on adaptation and presentation of **AgHorizon** are testimony to our commitment to the agricultural sector.

ARE WE UNDERESTIMATING THE RISKS?

The Coupled Model Intercomparison Project or CMIP is a global collaborative effort to run standardized climate models, helping scientists understand and predict climate change using ensemble approaches. This means using multiple climate models or multiple runs of the same model with slightly different initial conditions to study and predict climate change. Ensemble approaches allow scientists to identify robust trends that appear across multiple models, quantify uncertainty in climate predictions and understand the range of possible future climate scenarios. For the preparation of the Explore2 dataset,[8] the data underlying our analysis, Météo-France has used the data from the CMIP5, i.e. the fifth update of the ensemble approach adopted by the CMIP.[9] However, a study by Palmer *et al.* (2021)[10] has shown that CMIP5 models underestimate the magnitude of precipitation and temperature changes over central Europe and the Mediterranean regions, compared with CMIP6. Models run using the sixth generation of CMIP data show wetter conditions for the winter months and drier conditions for the summer months than modelled in the CMIP5 models. By using an older generation of climate models, the climate change impacts and changes in frequency of weather extremes might therefore be an underestimate.



AGHORIZON: EMPOWERING FARMERS

As this report shows, farmers are already experiencing the negative consequences of climate change. Yet most lack the information of how the climate will continue to change in their region, how these changes will affect their crops, and what they can do about it. To facilitate decision-making on adaptation and resilience, **finres** has produced this analysis to alert farmers, policymakers, and other agricultural actors, on the risks and opportunities represented by the changing climate.

Finres has developed solutions to provide the data necessary to make informed decisions about future climate risks and the value represented by different adaptation technologies and measures. To make actionable data available to all farmers in France, **finres** launched the **AgHorizon** application, available at aghorizon.finres.org (FIGURE 5).

By entering their postcode, farmers can view climate, yield, and adaptation recommendations, all specific to their precise location. On **AgHorizon**, farmers have access to three essential sets of information:

1. **The evolution of their future climate across selected indicators relevant to crop-growth,** and in agronomically relevant time periods, for example from October to July for winter wheat.
2. **The consequences of these climatic evolutions for crop yield and revenues**, with a special attention on extreme weather years that particularly harm farmers.
3. **A prioritization of adaptive technologies and practices**, across six categories, specifically customized to the needs of each farmer, and measured against the consequences of extreme weather events on yields and revenue.

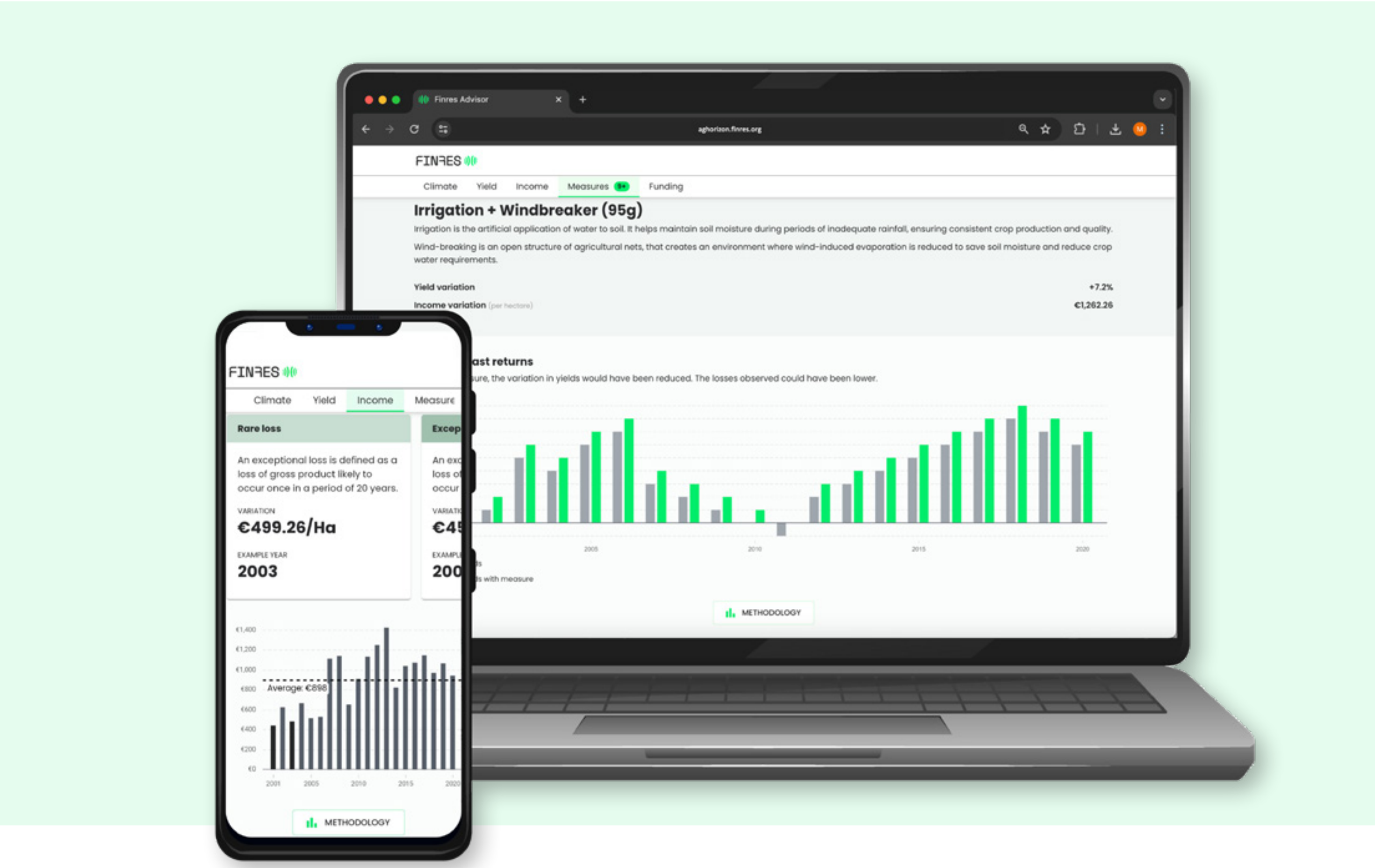
This data empowers farmers with the information they need to make the right investments to protect their income from the impacts of climate change. Adaptation options are prioritized by their return on investment, enabling farmers to optimize yields for specific crops given the changing climate in the location it is grown.

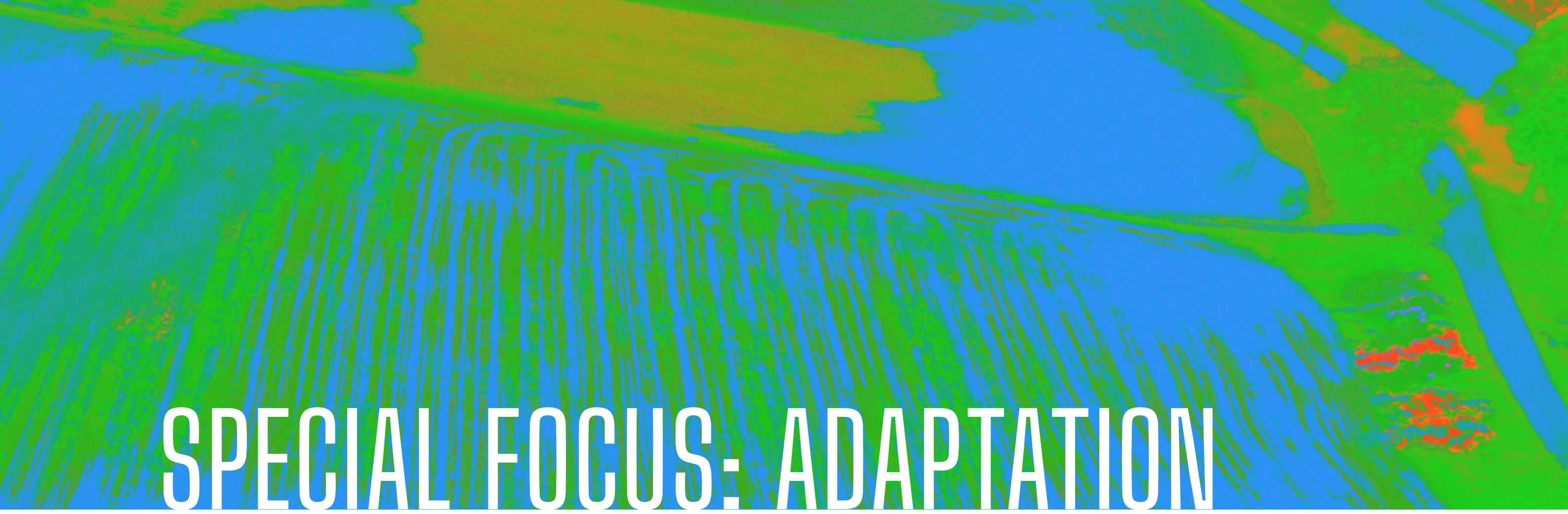
The value of these measures is shown in 'normal' years as the climate changes, but also for the extreme weather years which are most harmful to a farmer's income. Data for rare weather years (defined as likely to take place once every ten years) and exceptional weather years (once every 20 years) provide confidence to the farmer.

This information is calculated using advanced methodologies incorporating machine learning and other artificial intelligence to provide downscaled data from the world's leading climate models. This is combined with deep agronomic expertise on how specific crops are affected in each location and supplemented with scientific assessments of the impact of different adaptation measures and technologies. These include, for example, regenerative solutions such as soil covering or agroforestry, irrigation, different forms of shading, and drainage.

AgHorizon is currently available for 11 crops in France at an 8-km resolution. Data for more crops and European countries will be to be made available in the coming months, including at even greater resolution.

FIGURE 5 AgHorizon: empowering farmers with the information they need to invest in resilience





SPECIAL FOCUS: ADAPTATION
THE NEEDS, COSTS, AND BENEFITS

In the spring of 2024, finres produced a pioneering analysis for the Institute for Climate Economics on the cost of adaptation for the French agricultural sector.[11] The analysis showed that the effect of adaptation technologies and practices can reduce losses related to extreme climate by more than 20 percentage points. A euro invested as capital in adaptation generates a macro economic benefit of 1.40 euros.

Typical adaptation measures in agriculture include drainage for excess rain, irrigation for drought, but also innovative measures such as crop-covering, agro-forestry, and other means to support efficient plant growth given different weather conditions. At the higher levels of global warming which farmers may face further in the future, the beneficial effects of adaptation are multiplied by between 20 and 40 times, depending on locations, technologies and crops.

The research provided the first large-scale evaluation of climate change's impact on French agriculture. It covered 11 different crops and analyzed these across 86% of usable agricultural land in metropolitan France. Using projections for how climate change will affect each of these crops across all these locations, the report detailed the impact on yield, the most efficient solutions to adapt to the changing conditions, and the associated costs to implement them.

By focusing on the main agricultural regions of mainland France, the benefits associated with adaptation would lead, on average, to an improvement in yields and income valued at around 600 million euros per year. The state already allocates between 1,000 and 1,300 million euros per year to compensate for losses induced by climatic hazards on agricultural operations.[12] These expenses include support for precautionary savings (DEP), the subsidy for multi-risk climate insurance, the National Fund for Risk Management in Agriculture (FNGRA) as well as certain exemptions and coverage of social contributions.

To the extent that these benefits increase with warming, the progressive worsening of the consequences of climate hazards and changes on the agricultural sector would make technologies and practices increasingly necessary for the agricultural world.

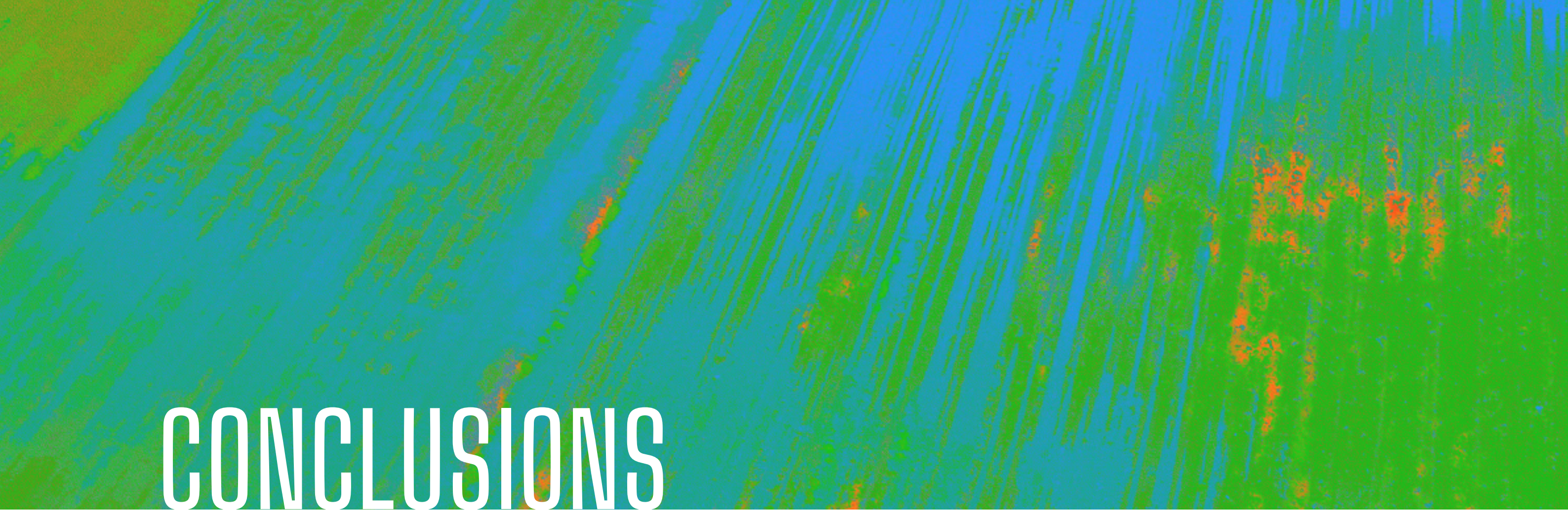
Achieving these benefits, however, would require substantial investments. The analysis from **finres** found that the annual cost of capital expenditure required aligned with the government's policy on food sovereignty, maximization of yields and resilience, guaranteeing the food self-sufficiency of France and Europe is 1,400 million euros.

As high as these figures are, they must be weighed against the total annual cost to the government of supporting the agricultural sector to deal with climate-related disasters. The agricultural sector in France also receives 8,744 million euros per year through the EU's Common Agricultural Policy, some of which is targeted towards sustainability initiatives but has been criticized for not focusing enough on the impacts of climate change.

NOT MONEY DOWN THE DRAIN

Adapting to the intensified variability of the climate is essential to sustain France's agricultural sector and to support the rural economy. One of the measures that could be implemented to reduce the negative impacts of excess precipitation on wheat yield is drainage. The table summarizes some results available in **AgHorizon**, which uses the same methodology developed for the groundbreaking study provided to I4CE. In some regions of France, especially those with specific pedological and climatological characteristics, drainage could avoid major losses. The benefits associated with drainage can be very large, especially when focusing on the extreme weather events expected to take place once every 10 ("rare") or 20 ("exceptional") years. Providing this data to farmers is critical for farm management strategies and investment planning, which is why finres developed **AgHorizon**.

Region Postcode	Reduction in loss associated with 1-in-10-year rare weather year	Reduction in loss associated with 1-in-20-year rare weather year
Grand Est 51300	-16% to -10%	-27% to -18%
Hauts-de-France 59200	-13% to -10%	-19% to -14%
Centre-Val de Loire 45600	-13% to -8%	-24% to -17%
Normandie 50200	-27% to -8%	-29% to -11%
Île-de-France 77720	-12% to -10%	-19% to -14%
Pays de la Loire 85200	-7% to 0%	-14% to -3%



CONCLUSIONS

This was a historically bad year for French agriculture.

Climate change is increasing the frequency and intensity of these bad years. This report has spotlighted the impact on the important wheat producing regions of north-eastern France. Extremely wet years leading to dramatic reductions in yield will increase 20-30% in the coming decades.

In addition to the increased frequency of acute climate shocks causing poor harvests highlighted in **AgHorizon**, farmers also must confront the longer-term, chronic impacts of climate change. Rising global temperatures and the changing climate means shifting zones of optimal growing conditions for different crops. Some farmers may struggle to generate sufficient returns maintaining their current rotation, others will need to modify their rotation to account for these changes and for the magnified variability of the current and future climate. Further research from **finres** on the impact of future climate conditions on crop suitability is under preparation and will be published in the coming months.

Farmers face many challenges as they seek to make a stable and rewarding return on their work to ensure the world has enough food to feed a growing population. The future of farming will involve shifts to more sustainable forms of farming that reduce the greenhouse gases causing climate change while safeguarding the biodiversity that underpins the long-term health of our planet. If this transition is to succeed, farmers also need more support to prepare for the impacts of climate change. These impacts are already being felt, not just in France, but across Europe, and around the world.

Business as usual cannot continue. Farmers need support to adapt to the changing climate. Governments, food producers, and everyone part of the agricultural value chain all have a part to play. Finres is ready to partner together with everyone committed to supporting the future of farming.

AgHorizon was developed by **finres** to provide farmers with the data necessary to make informed decisions about future climate risks and the value represented by different adaptation technologies and measures. **finres** would like to extend our appreciation to the many farmers who supported us developing **AgHorizon**. Your insights, expertise, and commitment to the future of farming have been invaluable.

Authors and reviewers

This report was written by Florent Baarsch and Mike Girling. Data were prepared by Mohamed Alkassem, Vhiny Mombo, and Sidiki Sanogo. The study benefited from revisions by Michiel Schaeffer, Louis d'Hautefeuille, and Mathilde Duvallet.

Endnotes

The analysis from this report was drawn from the following sources:

[1] These six French regions produce more than 60% of French wheat: Centre-Val de Loire, Grand Est, Hauts-de-France, Île-de-France, Normandy and Pays de la Loire.

[2] Agreste, "Grandes cultures. En 2024, baisse de 22% de la production des céréales à paille par rapport à la moyenne des 5 campagnes précédentes", consulted on 30/10/2024, https://agreste.agriculture.gouv.fr/agreste-web/disaron/IraGcu24113/detail/

[3] Agreste, "Mémento de la statistique agricole, édition 2023", consulted on 30/10/2024, https://agreste.agriculture.gouv.fr/agreste-web/disaron/MemSta2023/detail/

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[5] Arvalis, "Récolte Des Blés 2016 Une Année Complétement Atypique", consulted on 30/10/2024, https://www.arvalis.fr/sites/default/files/imported_files/doss_presse_recolte_bles7728213614823161969.pdf

[6] France 24, "Fewer, older, poorer: France's farming crisis in numbers", consulted on 30/10/2024, https://www.france24.com/en/business/20240124-france-farming-crisis-in-numbers

[7] Nóia Júnior RS, Deswarte JC, Cohan JP, et al. "The extreme 2016 wheat yield failure in France." Glob Chang Biol. 2023;29(11):3130-3146, consulted on 30/10/2024, doi:10.1111/gcb.16662

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[10] T.E. Palmer, B.B.B. Booth and C.F. McSweeney. 2021. "How does the CMIP6 ensemble change the picture for European climate projections?" *Environmental Research Letters* 16 094042, consulted on 30/10/2024, https://doi.org/10.1088/1748-9326/ac1ed9

[11] Institute for Climate Economics, "Implications économiques des trajectoires d'adaptation", consulted on 30/10/2024, https://www.i4ce.org/projet/tracc-implications-economiques-des-trajectoires-de-rechauffement-de-reference-pour-ladaptation-au-changement-climatique/

[12] Institute for Climate Economics, "Estimation des dépenses publiques liées aux crises agricoles en France entre 2013 et 2022", consulted on 30/10/2024, https://www.i4ce.org/wp-content/uploads/2024/02/Estimation-des-depenses-publiques-liees-aux-crises-agricoles-en-France-entre-2013-et-2022_V1.pdf

Note on the data and climate models used

Historical precipitation and radiation are observation data available on the Météo-France 'public data' portal. These data are used by Météo-France as input to the SIM2 hydrological model and are made available with the model's output. The climate projections come from the 'DRIAS Climate Futures' project database and are derived from climate simulations carried out as part of the Explore2 project with 17 regional climate models (RCMs), each forced with the output of a CMIP5 general atmospheric circulation (GCM) model.

More details are available in the following reference :
https://www.drias-eau.fr/accompagnement/sections/305
https://www.drias-climat.fr/accompagnement/sections/401

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