Impacts & risks for agriculture from climate chance:

Adaptation solutions & the role of new plant varieties

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Climate change effects intensify

DW NEWS

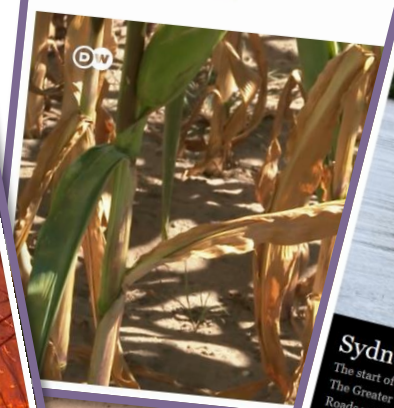
Heat wave in Europe: Which countries are worst hit?

Summer fires aren't unusual. But climate change means they've scorched Western Europe much earlier than usual this year, destroying tens of thousands of acres of land and causing massive evacuations as some places record their hottest temperatures ever.

DW NEWS

Drought forces the Netherlands to adapt to climate change

The Netherlands is normally one of the wettest countries in Europe. But this summer, it's also battling a prolonged drought and water shortages. With a third of its land below sea level, the Netherlands is particularly vulnerable to climate change.



Sydney flooding

The start of July brought the fourth set of floods in 18 months to the Australian state of New South Wales. The Greater Sydney area was especially affected, with eight months worth of rain falling in just four days. Roads were turned into rivers and tens of thousands of people evacuated from their homes. Prime Minister Anthony Albanese said the repeated floods proved the need for climate action.

South Africa extreme rains

In April, intense rains hit the eastern coast of South Africa, causing floods and landslides that claimed more than 400 lives, destroyed over 12,000 houses and forced an estimated 40,000 people from their homes. A World Weather Attribution study found that climate change made the rains in South Africa twice as likely and up to 8% more intense.

East Africa prolonged drought

East Africa is experiencing one of the worst droughts in decades. It started last year and is still ongoing after a fourth season of failed rains. Up to 20 million people are now at risk of severe hunger. Scientists say the decline in the spring rainy season, which is tied to warmer waters in the Indian Ocean, causes rains to fall rapidly over the ocean before reaching land.

ENVIRONMENT

Climate change: Flooding, drought, fire and heat waves around the world

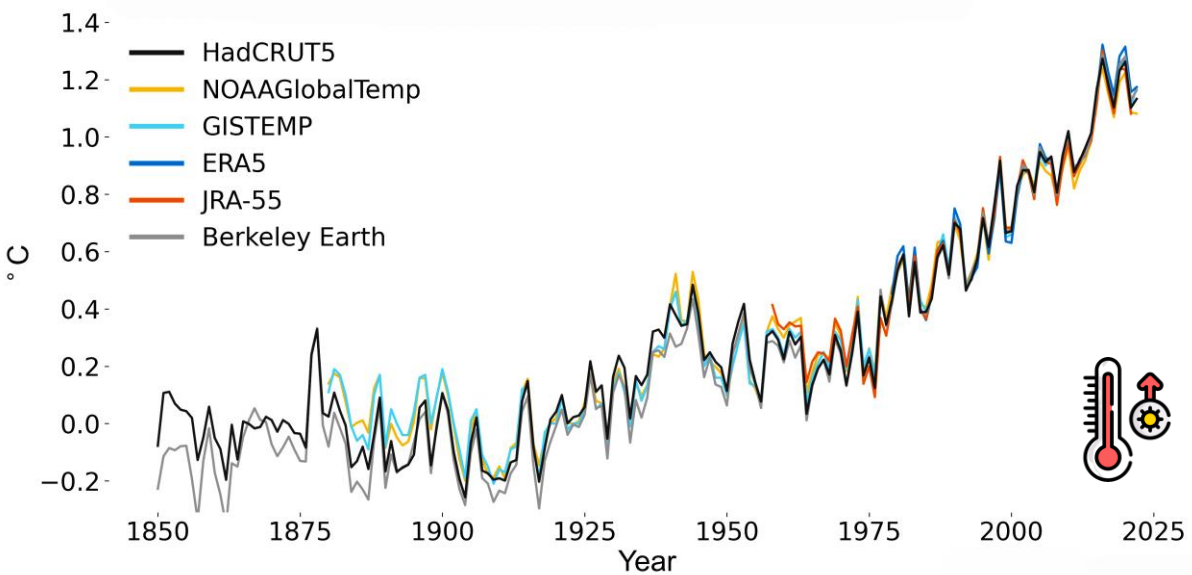
The climate crisis has intensified risk conditions for extreme weather events across the world. Erratic seasonal swings have caused floods, wildfires, heat waves and droughts on an unprecedented scale.

Heavy rains devastate communities in Kentucky, USA

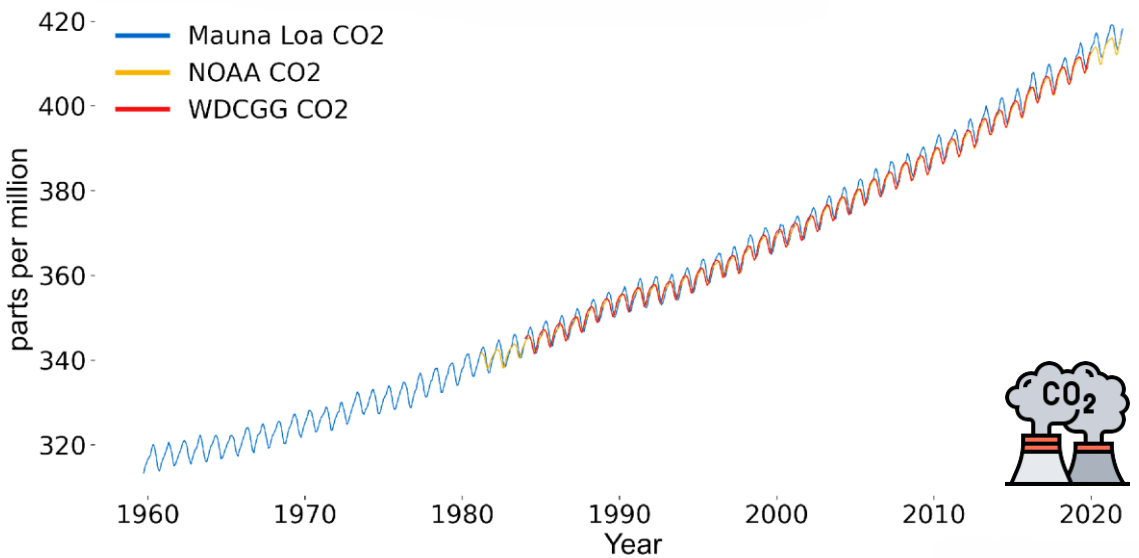
Heavy rain has pummeled mountain communities in the US state of Kentucky. Water rushed down hillsides, swallowing towns, washing away homes and trapping hundreds of people. At least 30 people have been killed. US Vice President Kamala Harris said the flooding showed the urgency of crisis and announced $1 billion in grants to help states prepare for weather extremes worsened by climate change.

Climate change global indicators

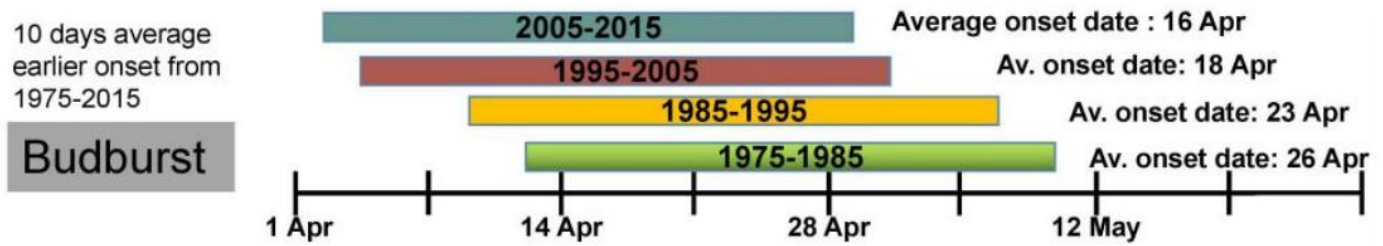
Global mean temperature difference from 1850-2022

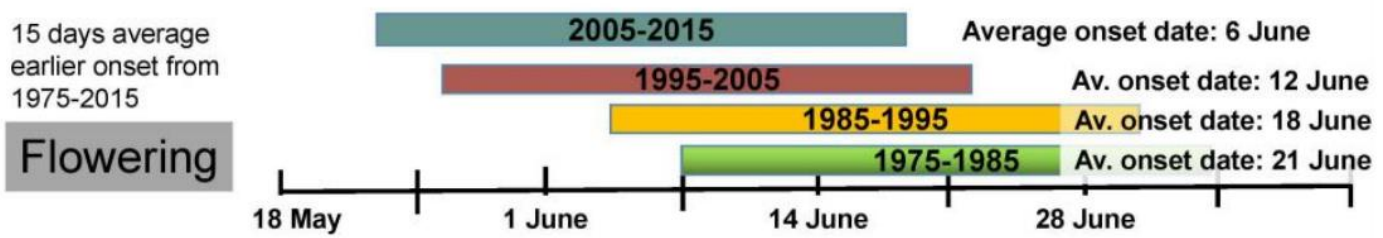


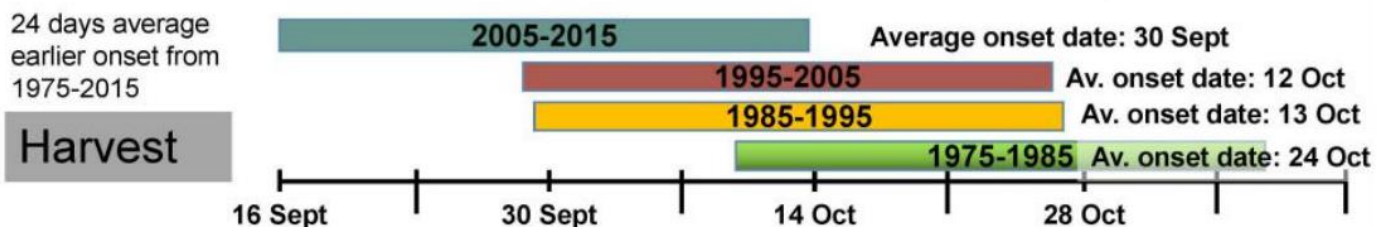
Carbon dioxide concentrations (parts per million)

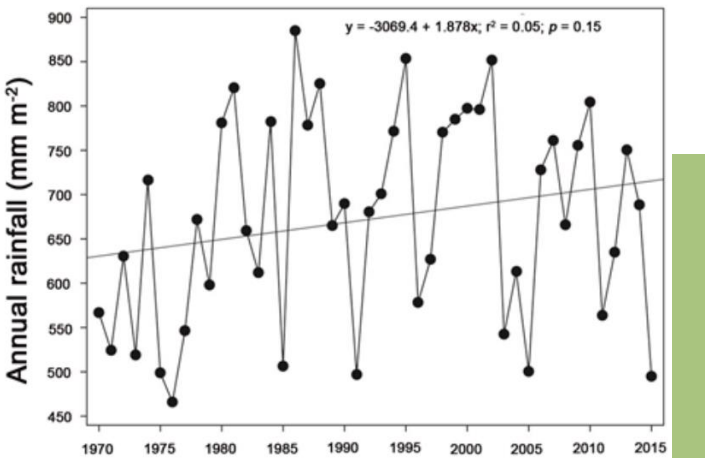


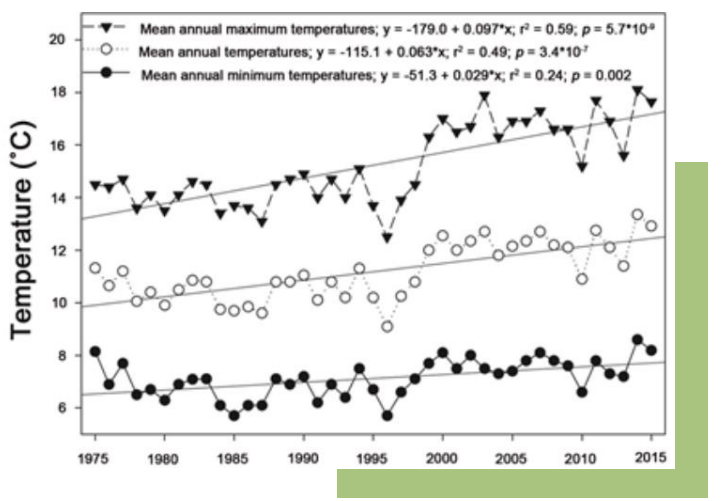
Phenological changes of four grapevine varieties grown in Hainfeld, Germany (1975-2015)











Variedades 'Pinot Gris', 'Pinot Noir', 'Riesling' and 'Muller Thurgau'

Impact of climate change on plant breeding

Loss of genetic biodiversity

Changes in environmental conditions promote erosion of biodiversity

Outbreak of pest and diseases

Increase in temperature and relative humidity set the ideal environment for disease proliferation

Risk of water supply

In some areas, rainfall intensifies or on the contrary it can cause prolonged drought

Change in seasonality

Increasing occurrence of climatic events out of season such as late-spring frosts

Heat stress

A combined effect of heat and water-deficit stress leading to a reduction in plant productivity

Food insecurity

Climate change impacts agricultural production, supply chains, and food pricing

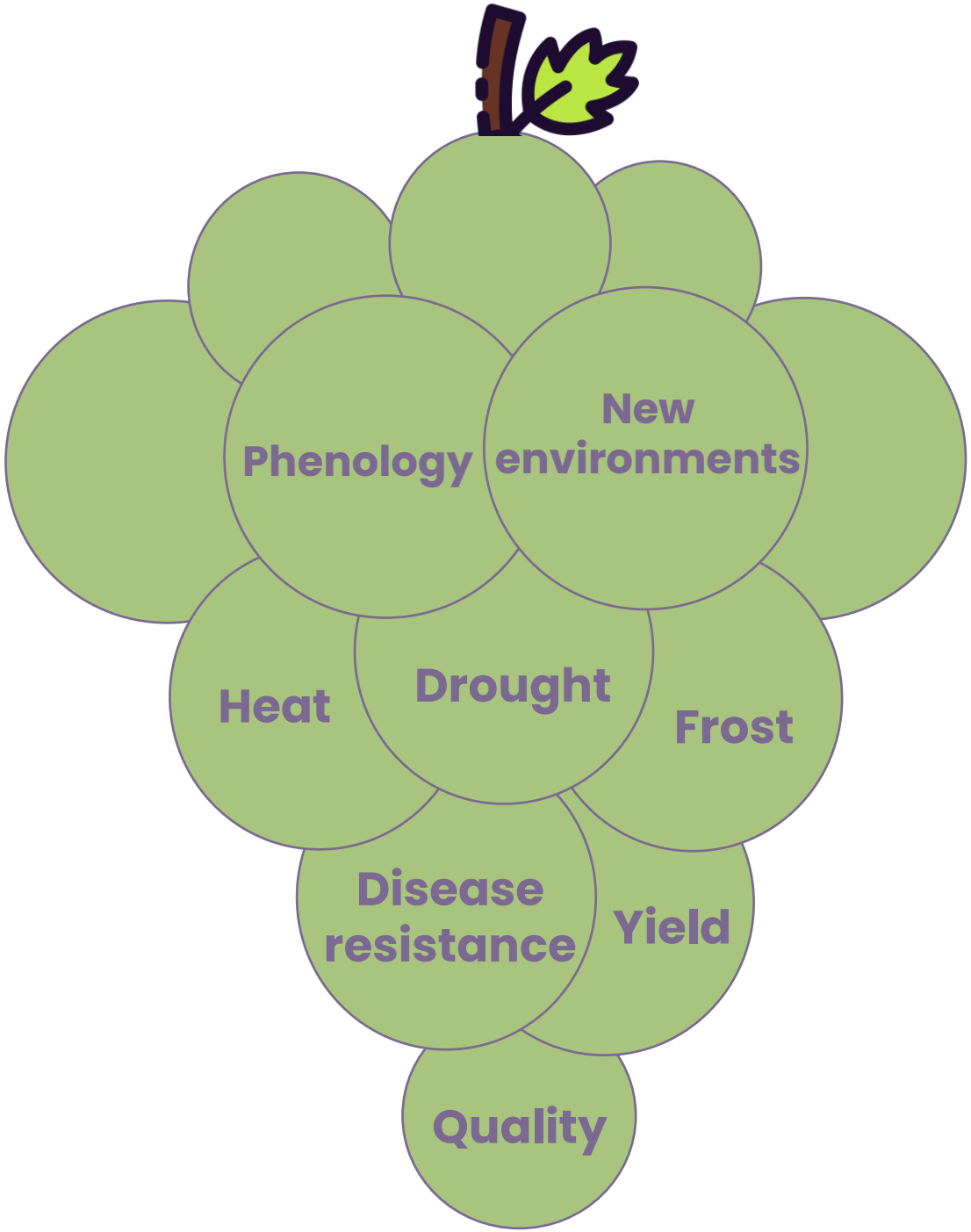
Climate change adaptation solutions

Approach of plant breeders

Increasing Climate Resilience

Accelerated Plant Breeding

Grapevine breeding



Climate change adaptation solutions

Accelerated Plant Breeding

Optimizing CRISPR Systems

Plant regeneration methods

Predictive breeding

Should be extended to vulnerable crops

Securing genetic diversity

Finding “lost traits”

Speed breeding

Accelerating crop research and breeding

Prospectives

Heterogenous Impact

Climate changes affects differently every crop depending on the location

Increase diversity

Encourage a general expansion of genetic pool and make available functional genes

Accelerating Plant Breeding

- Use of new technologies
- Speed Breeding
- Extend the new methods to more crops

Thank you for your attention

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