Everything you need to know about plant health and why it matters more than ever

Dr Ida Wilson

Bio Revolution

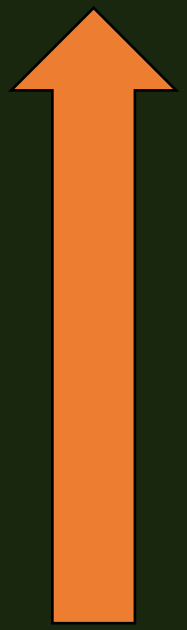
Open Rubri


Vulnerability
Risk
Climate change
The world today
Plant health

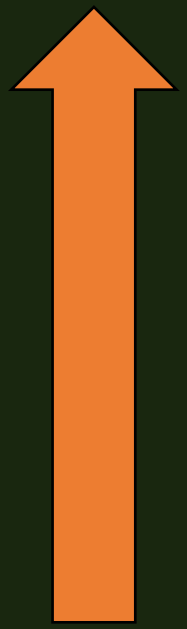

Vulnerability

Risk

Vulnerable



Risk



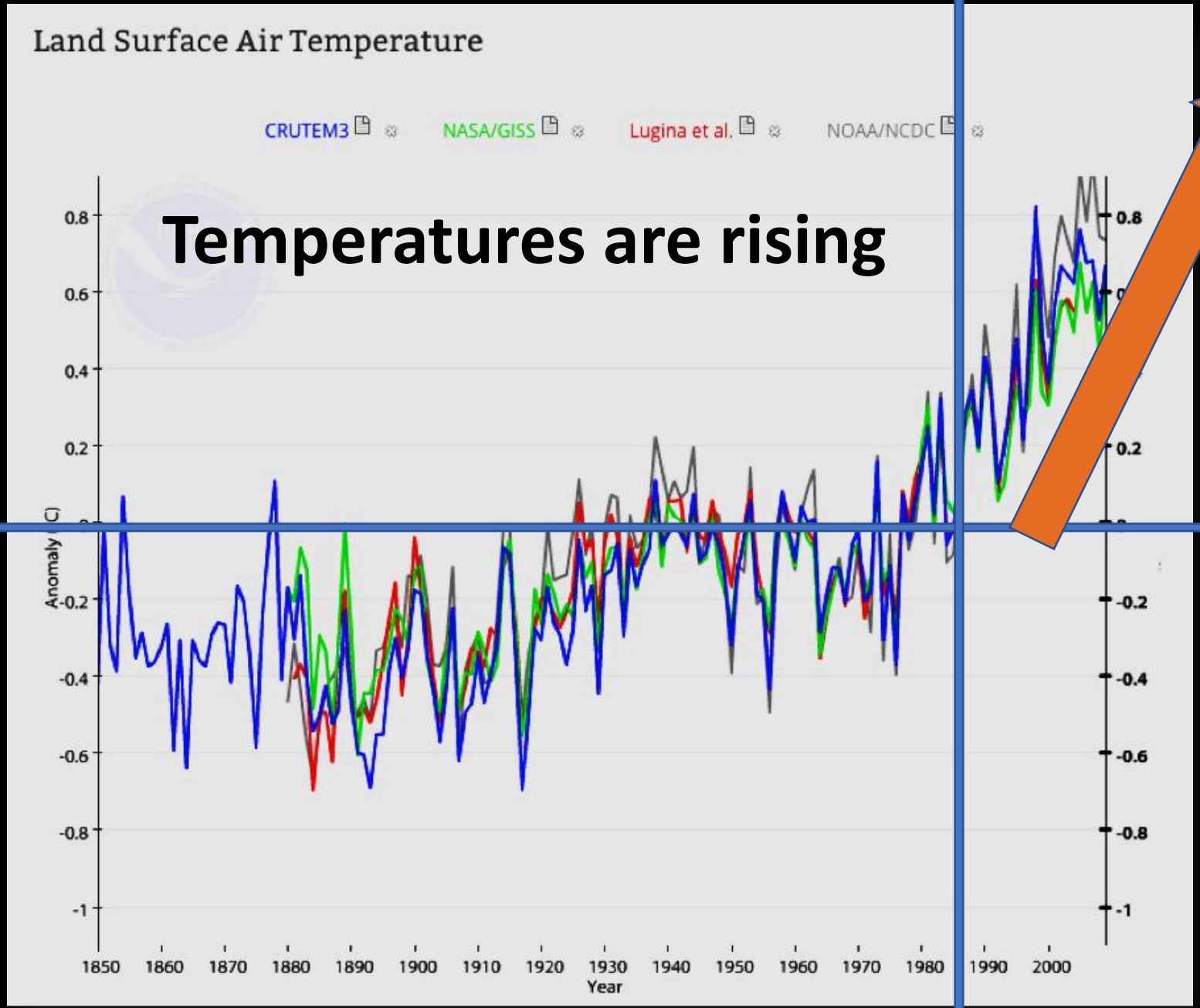
Vulnerable

Vulnerable

Vulnerable

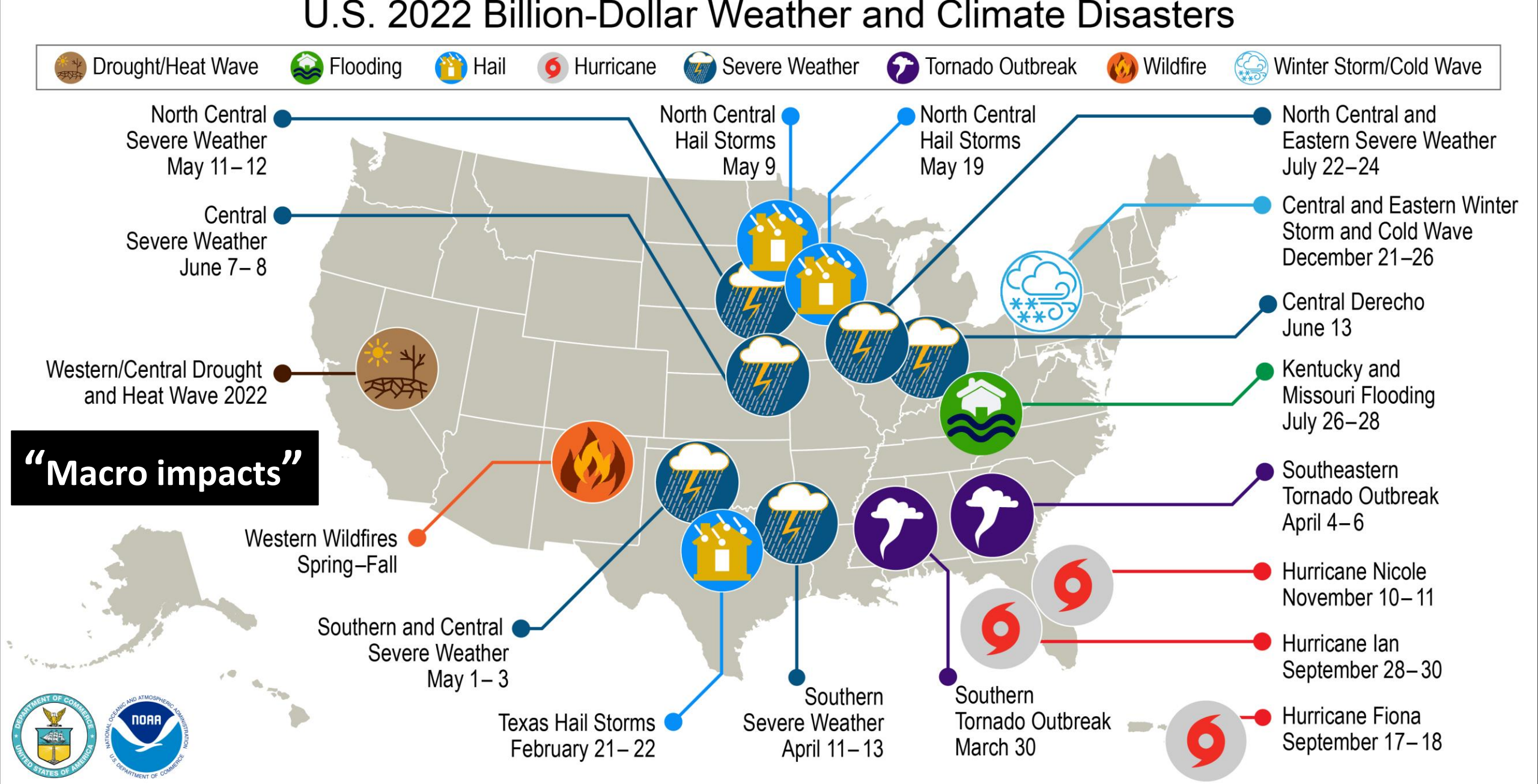

Climate change

Greenhouse gasses are rising



https://www.climaterealityproject.org/blog/10-indicators-that-show-climate-change

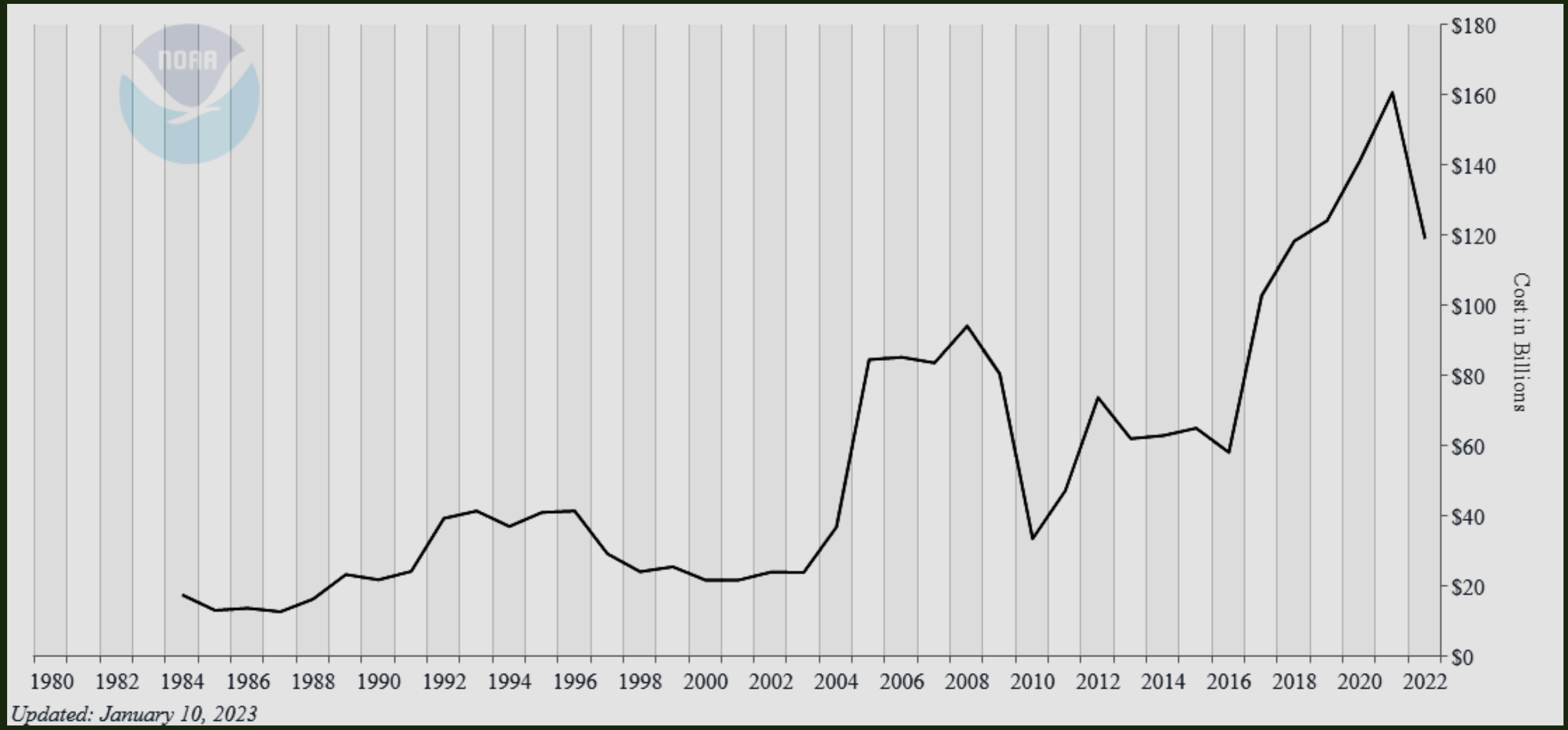
U.S. 2022 Billion-Dollar Weather and Climate Disasters



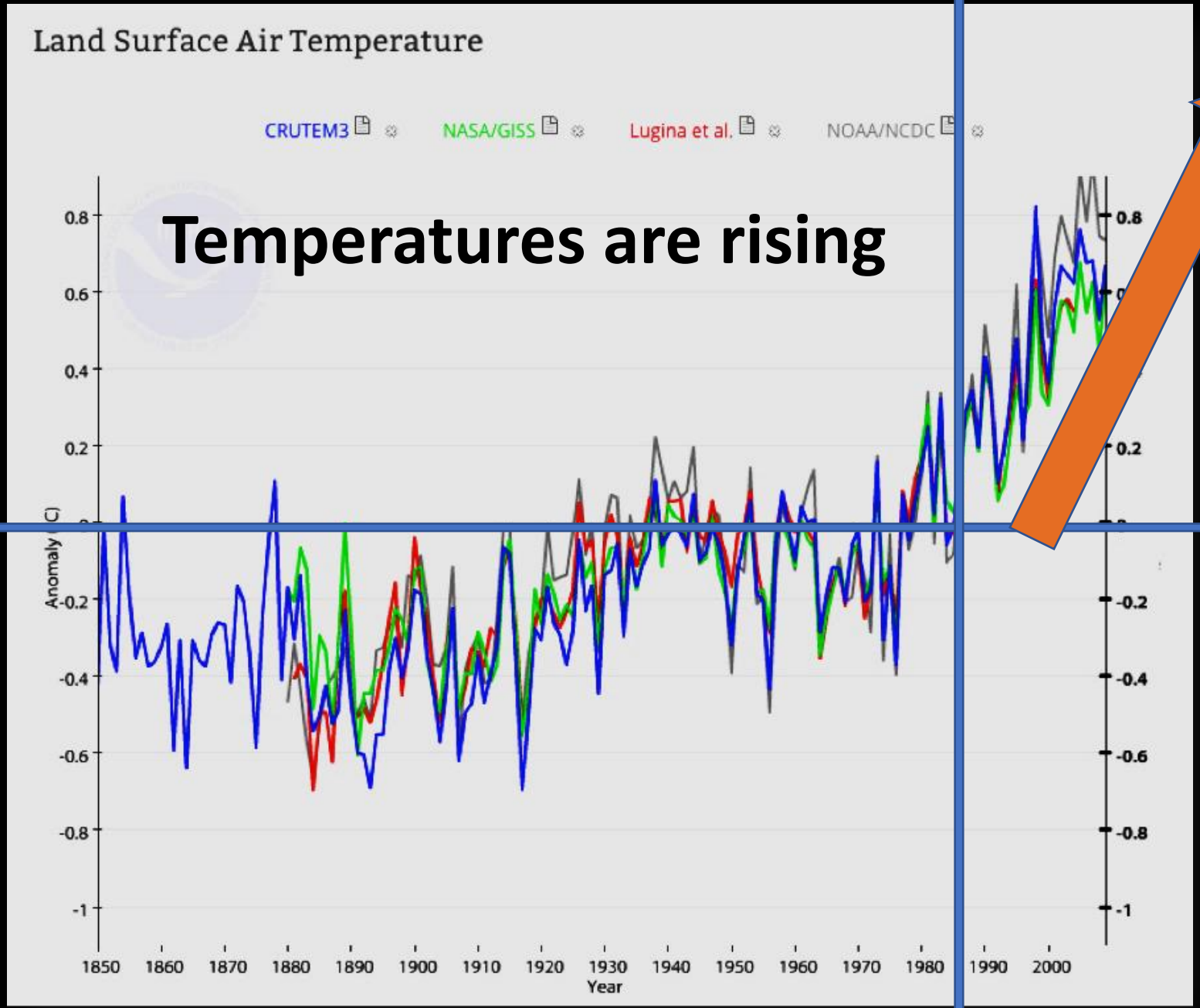
"Macro impacts"

*This map denotes the approximate location for each of the **18 separate billion-dollar weather and climate disasters that impacted the United States in 2022.***

Average 5-year cost of disasters in Billions



National Oceanic and Atmospheric Administration 2022



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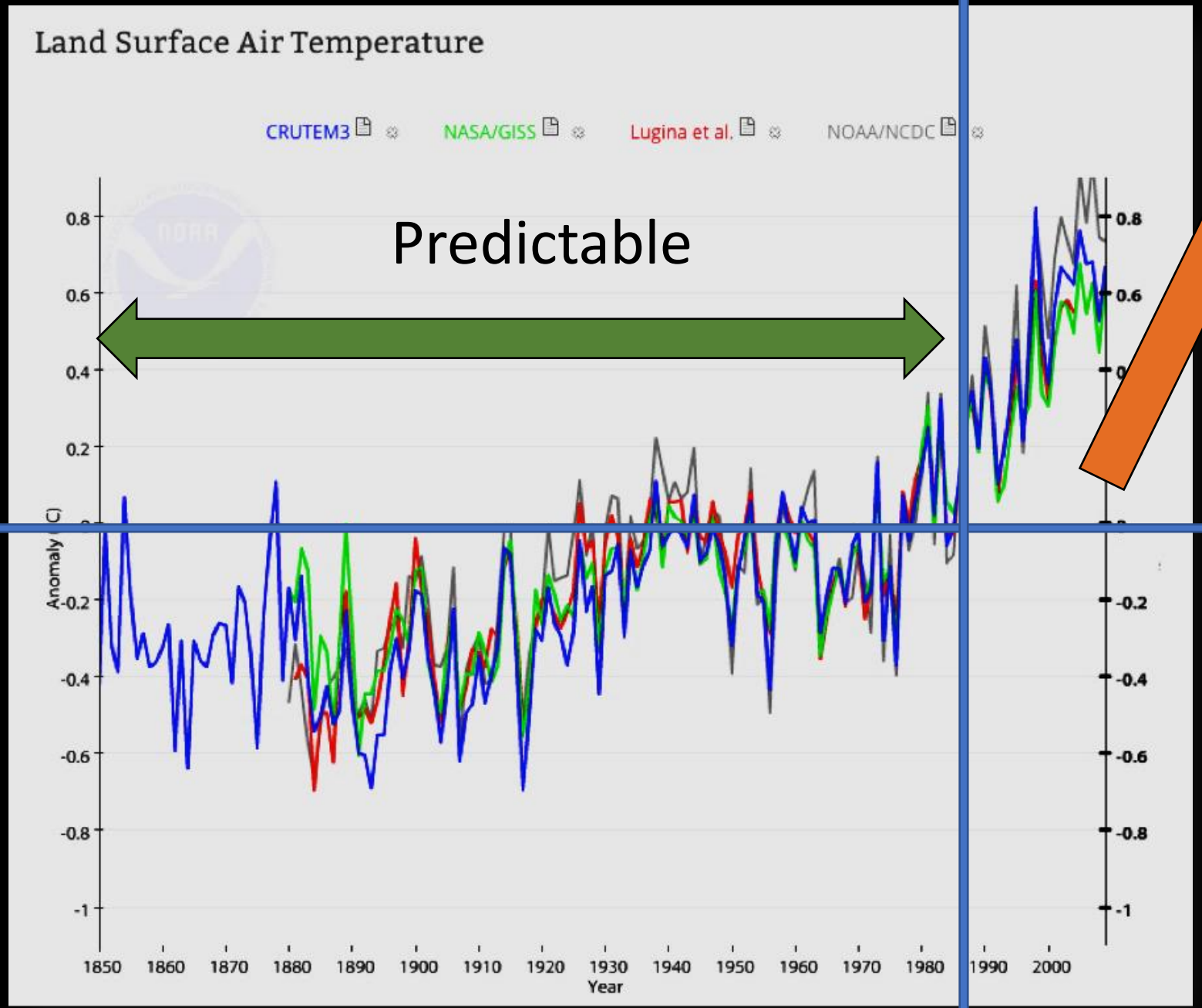
“Micro impacts”

Climate is the driver of the occurrence of **all living organisms** on the planet.

As **climate changes** the geographical areas where organisms live and their **relative abundance shifts**.

Our current climate is not the same as the climate of the past



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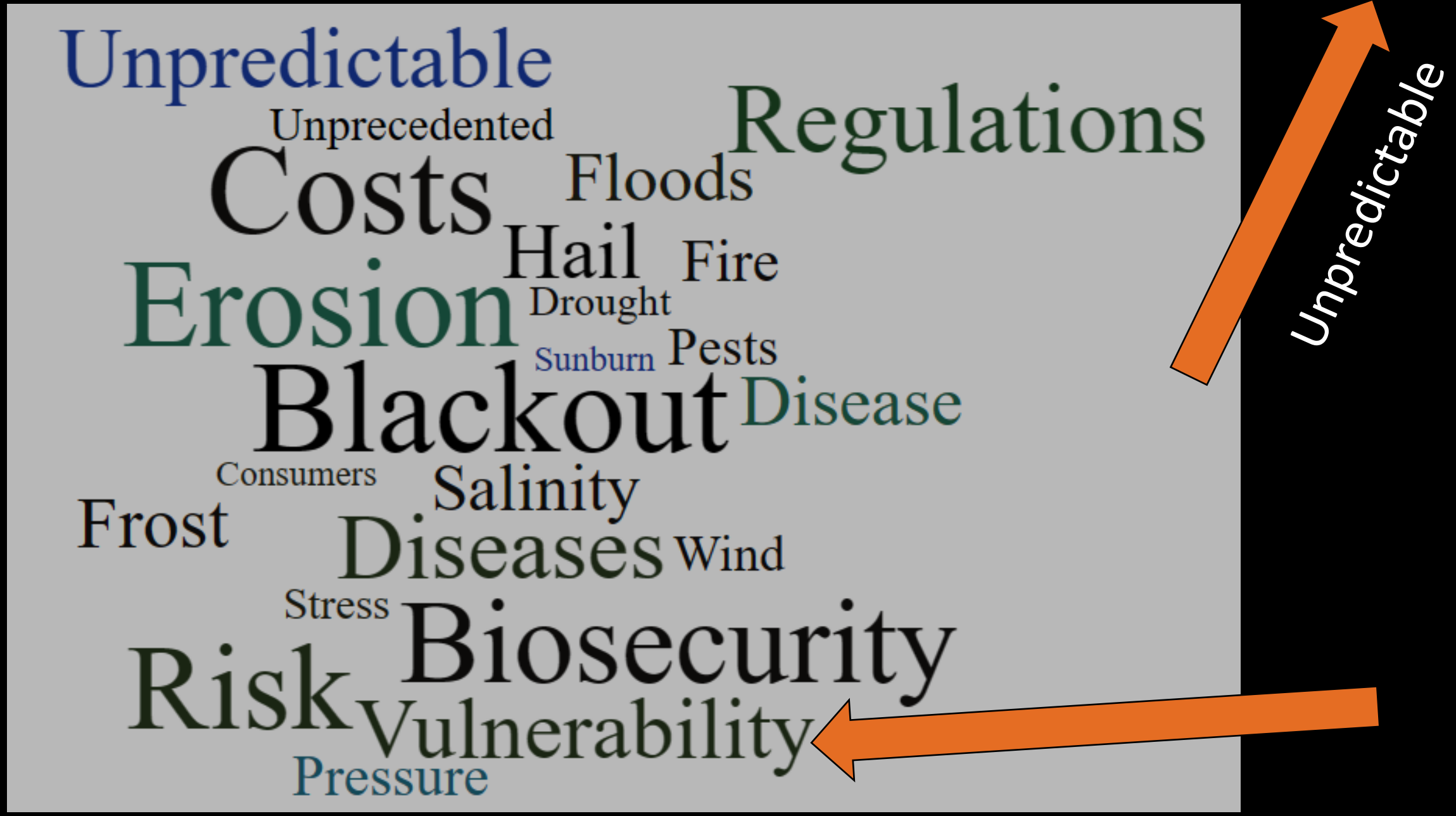
Unpredictable
Unprecedented
Regulations
Costs
Floods
Hail
Fire
Erosion
Drought
Sunburn
Pests
Blackout
Disease
Consumers
Salinity
Frost
Diseases
Wind
Stress
Biosecurity
Risk
Vulnerability
Pressure
Unpredictable

BUSINESS AS USUAL

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SLOW RESPONSE COULD BE GOOD ENOUGH

SUCCESS IN CROP PRODUCTION WITH "OLD RECIPE"

1850-2000

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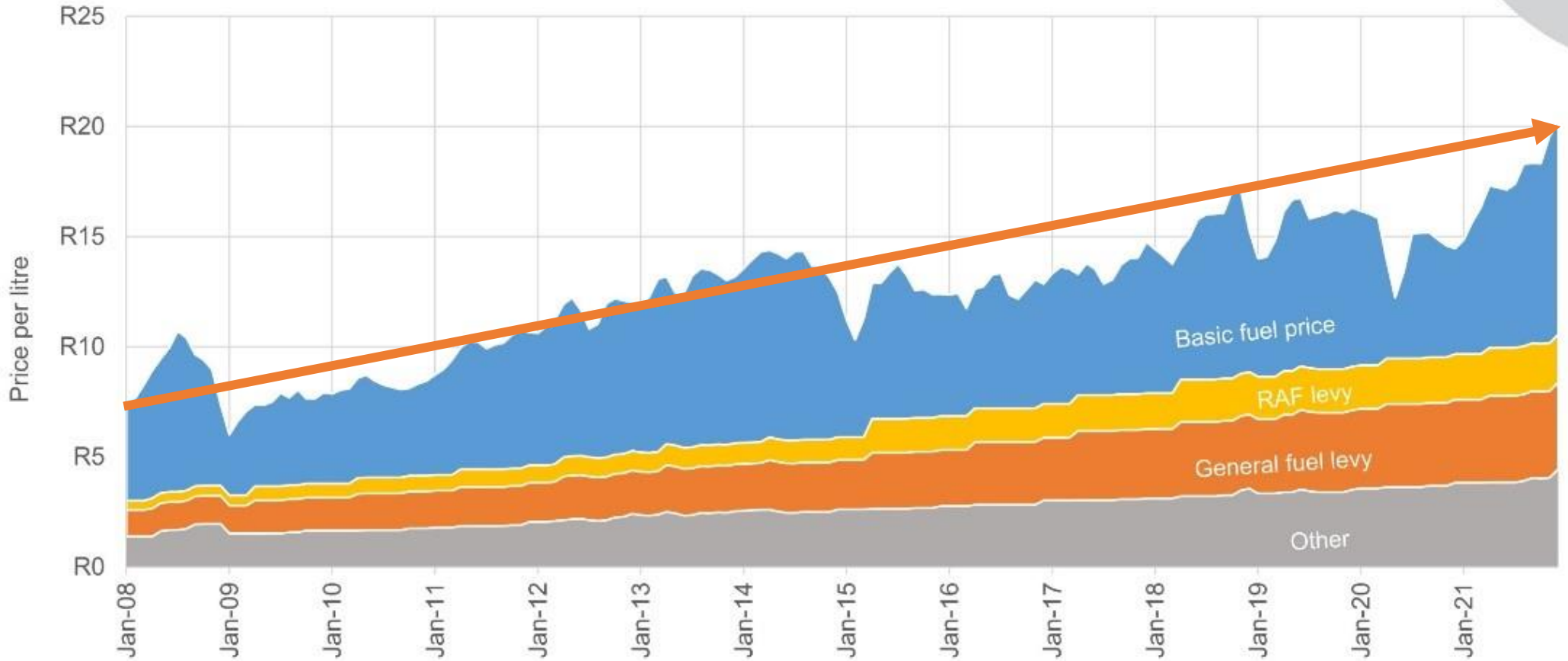
NEEDS NEW APPROACH

POST 2000

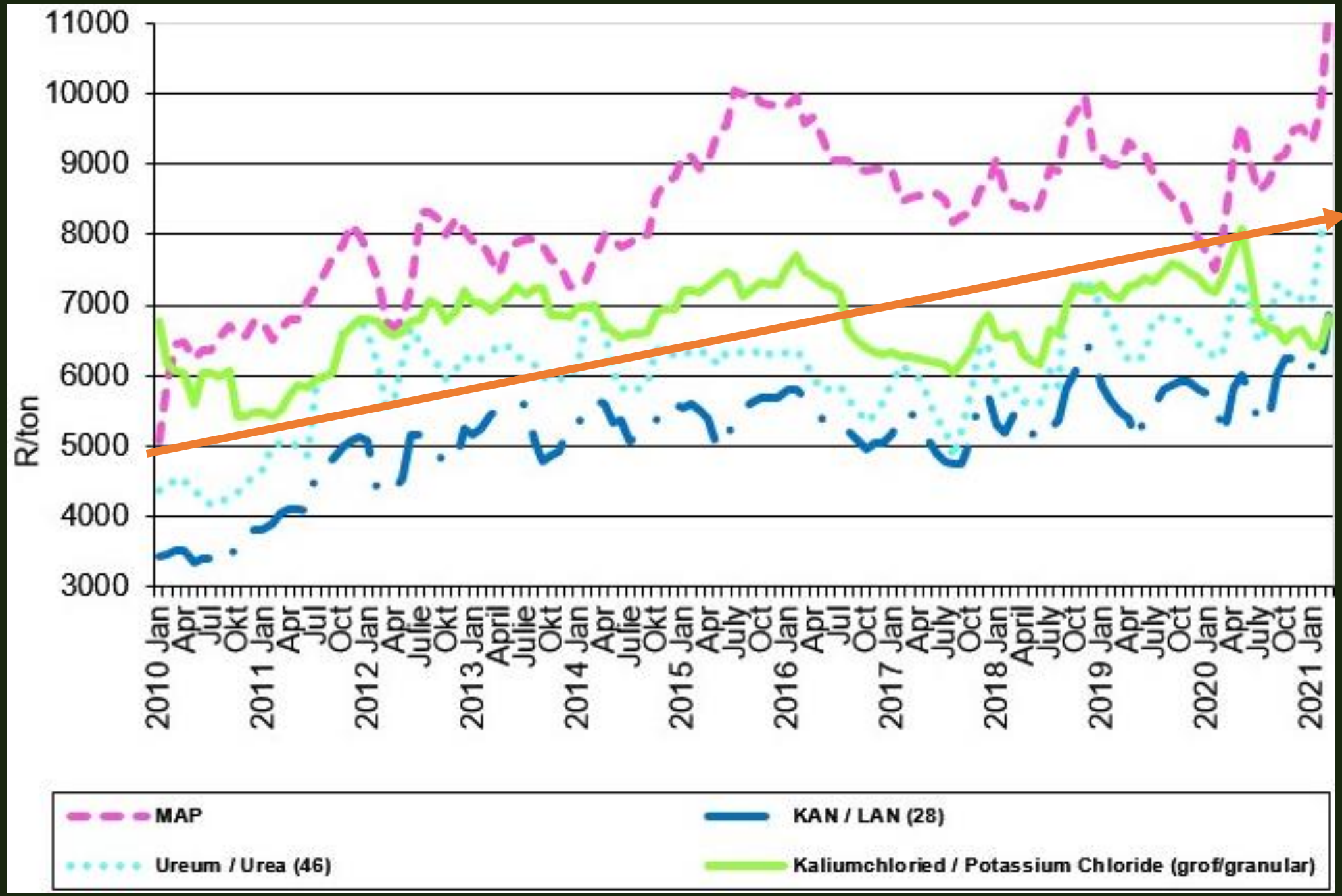
The world today

Figure 2: Components that make up the petrol price have risen over time

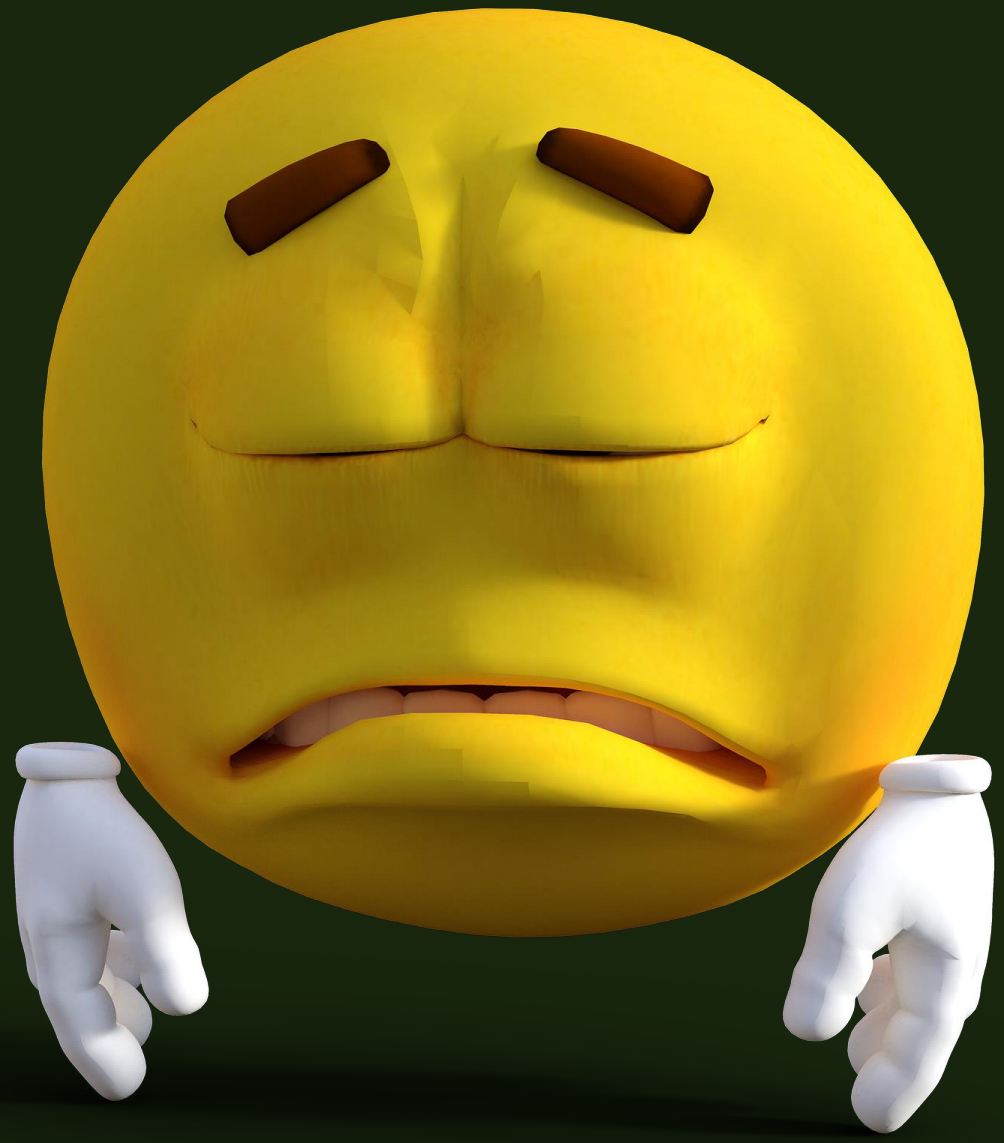
A breakdown of the monthly per litre price of inland 95-octane petrol



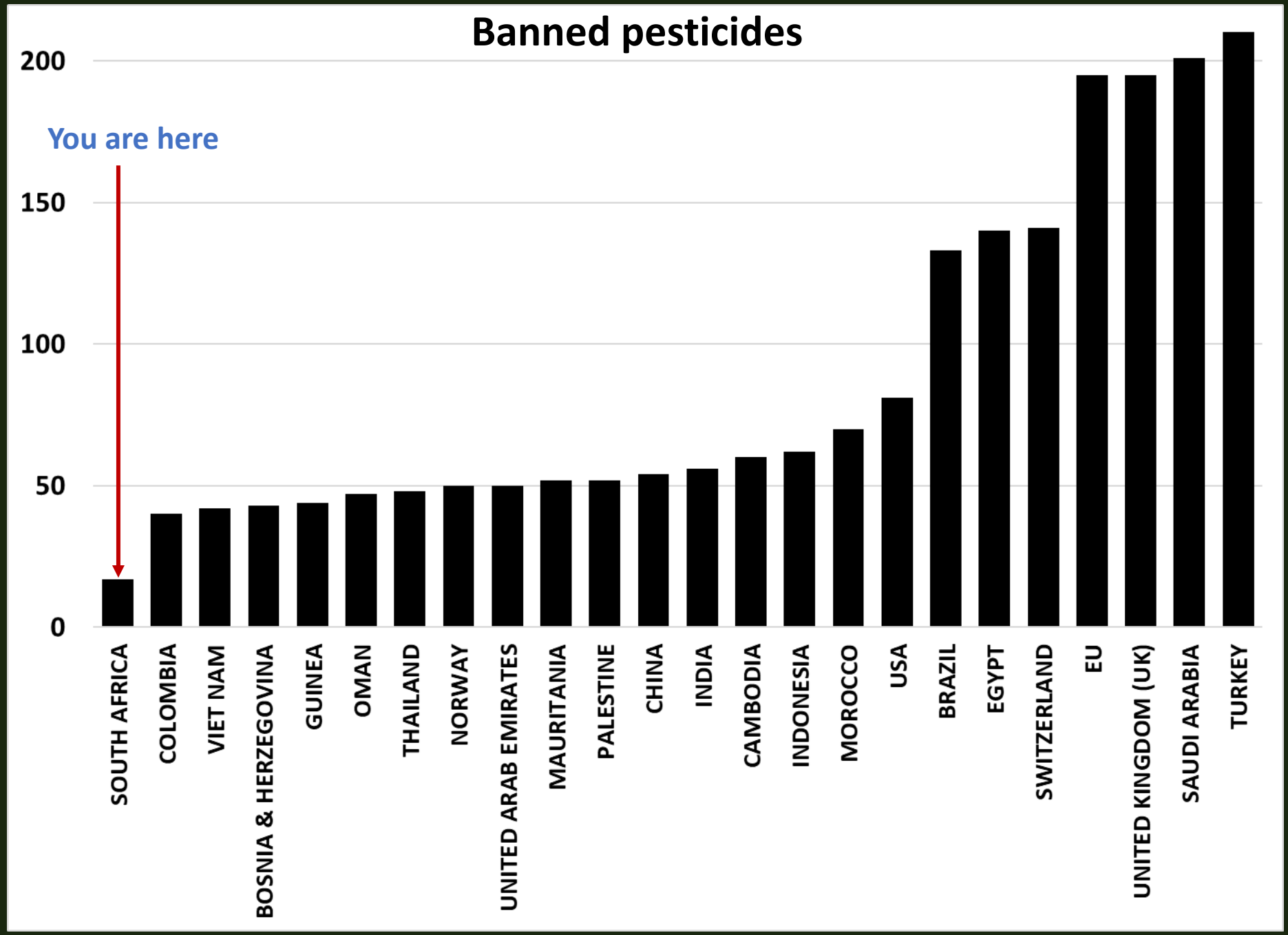
Source: Department of Mineral Resources and Energy, http://www.energy.gov.za/files/esources/petroleum/petroleum_arch.html



Ikageng Maluleke, Agricultural Economist – data sourced from GrainSA



Eskom



PAN International Consolidated List of Banned Pesticides 6th Edition, May 2022

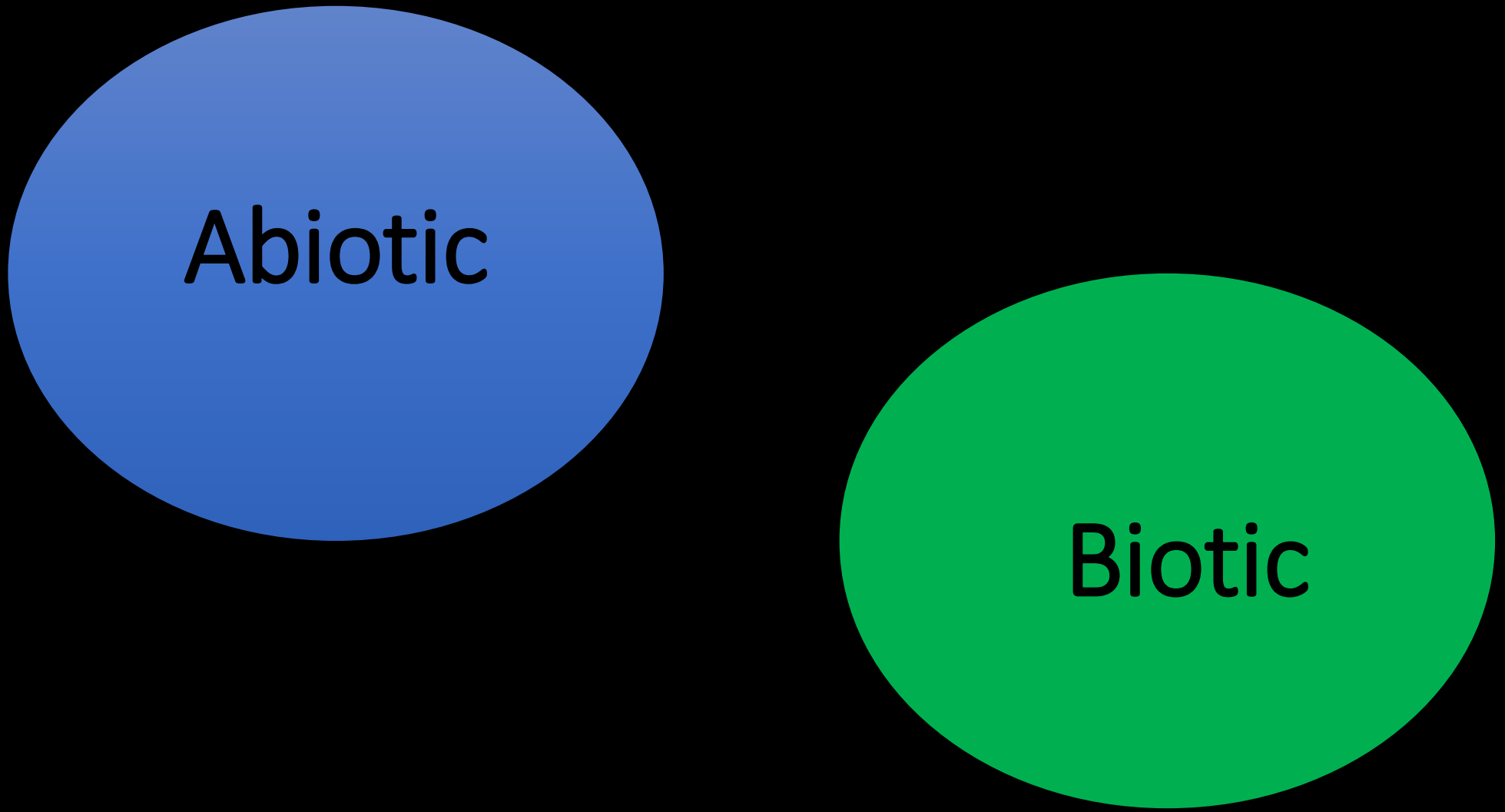
Polyphagous shot hole borer

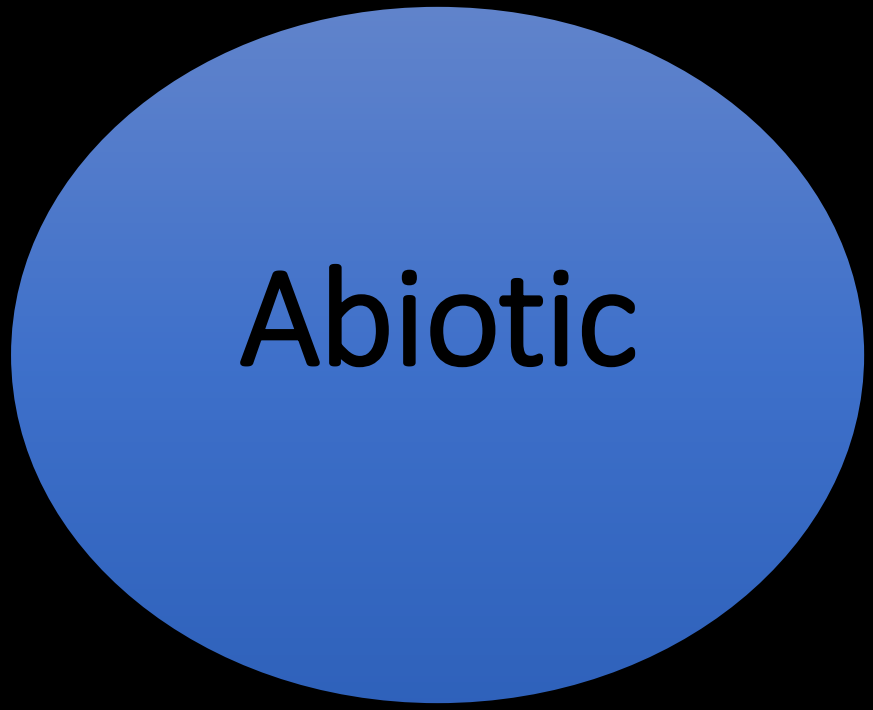
BUSINESSTECH

This tiny beetle is eating its way through tree-rich towns in South Africa – and is set to cost the economy R275 billion

Staff Writer 25 May 2022

What is the cause injury to plants to make them sick?


Abiotic
Biotic



-Non living things

- Climate extremes like drought

- Nutritional imbalances

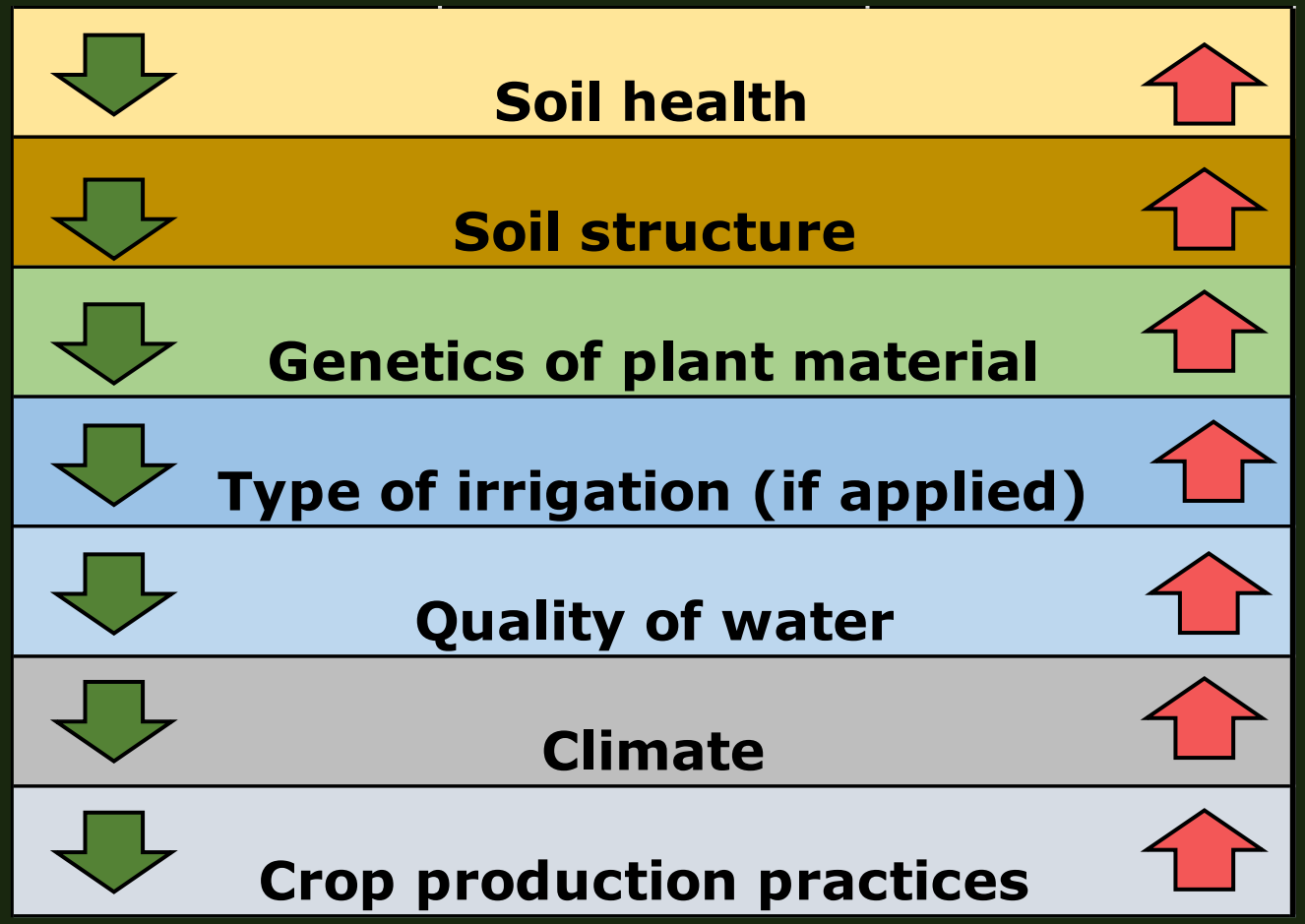
- Damage due to agrochemicals

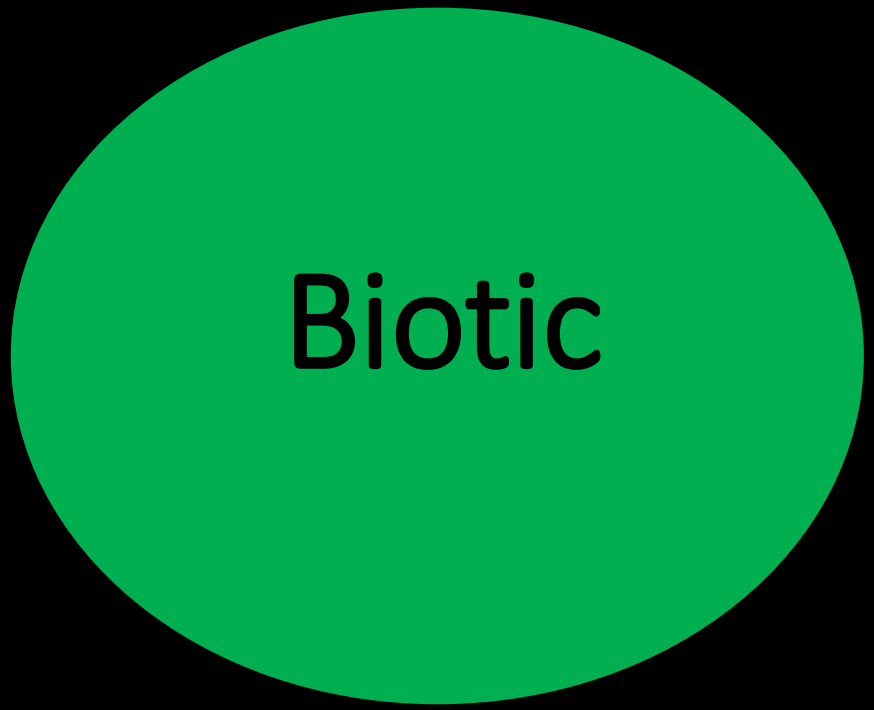
- Genetic traits

RISK PROFILE

Abiotic

Plant production system risk profile





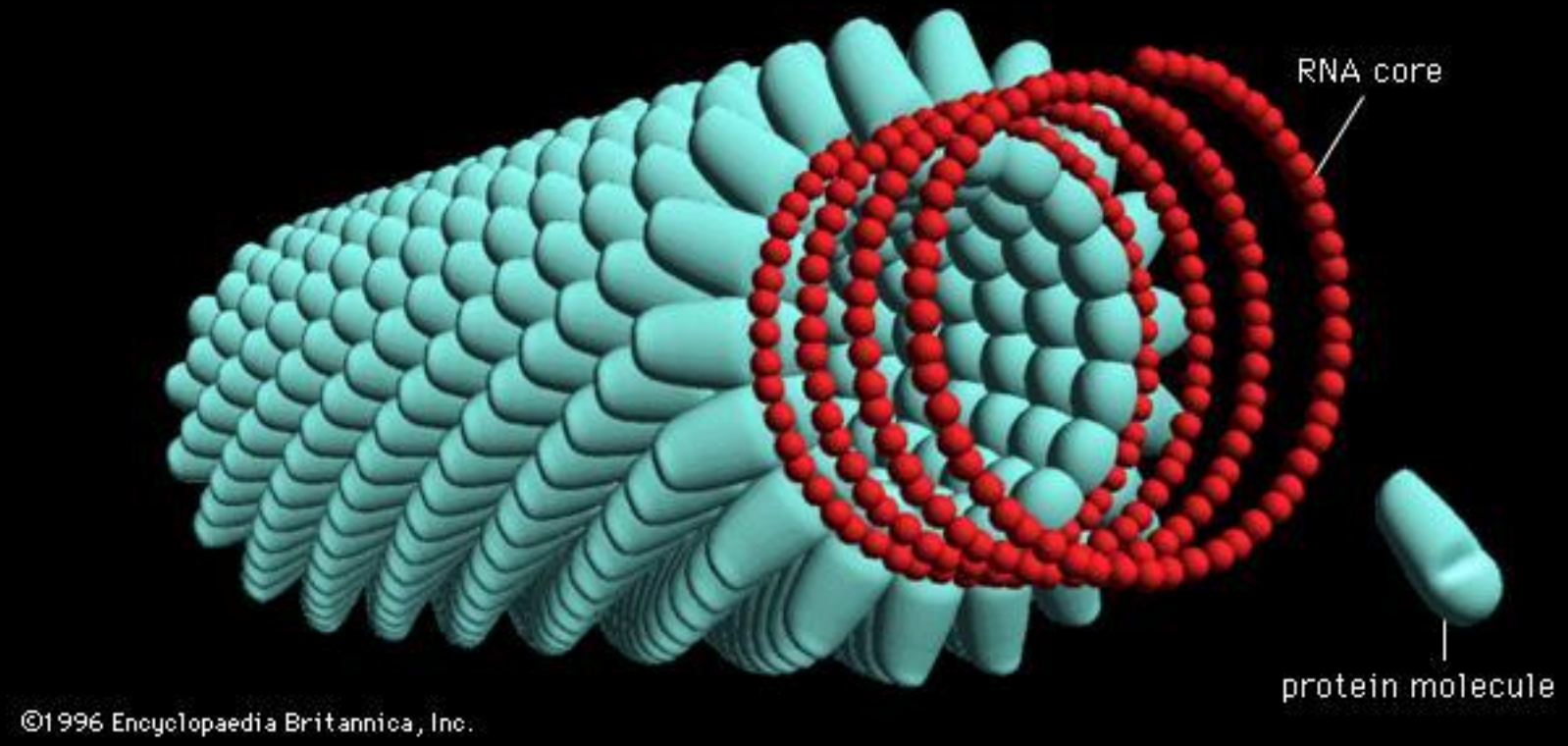
- Living organisms
- Transmittable
- Infectious

Viruses

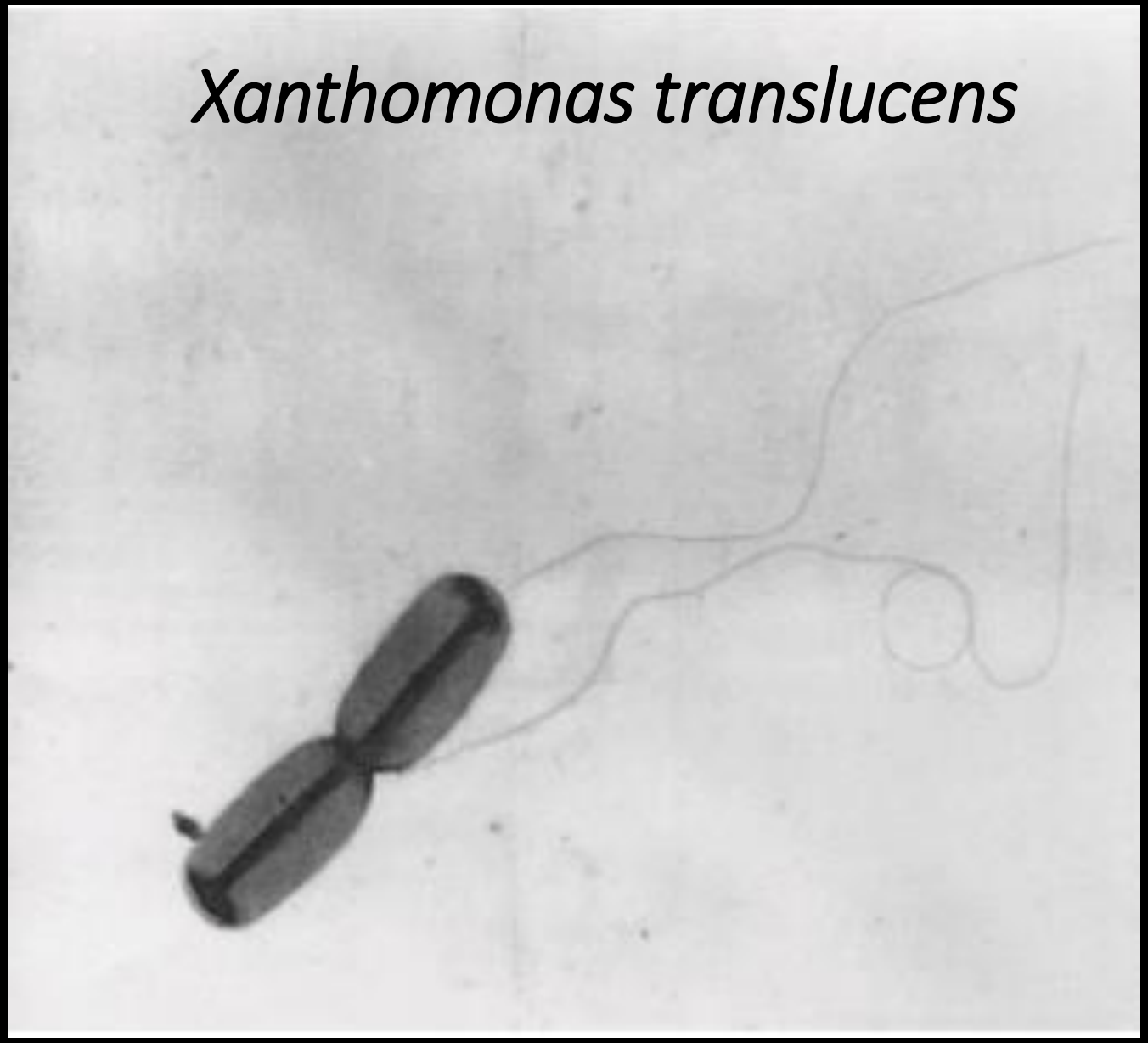
Bacteria

Fungi

Tobacco mosaic virus

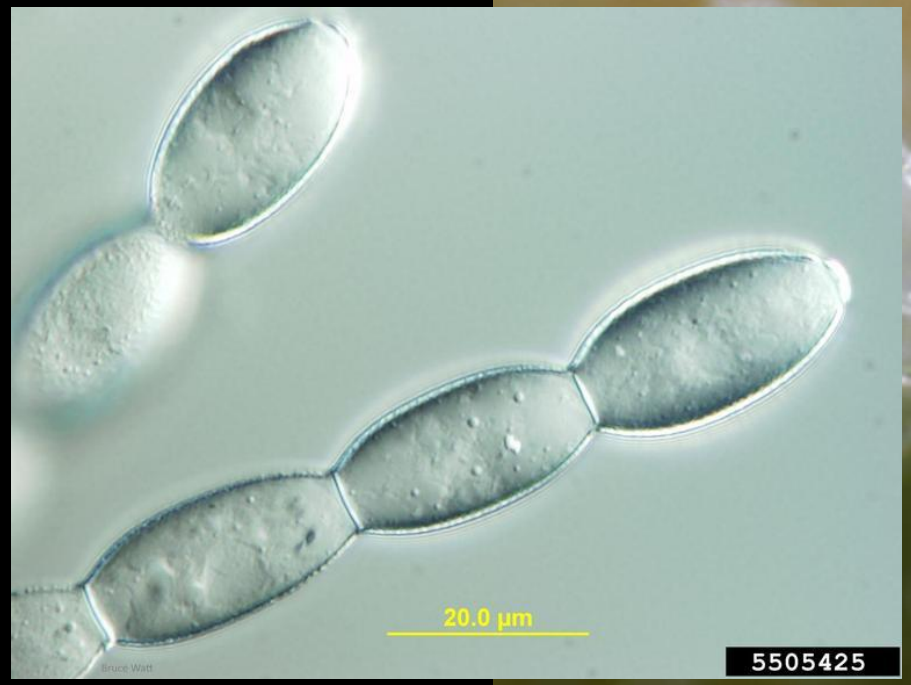


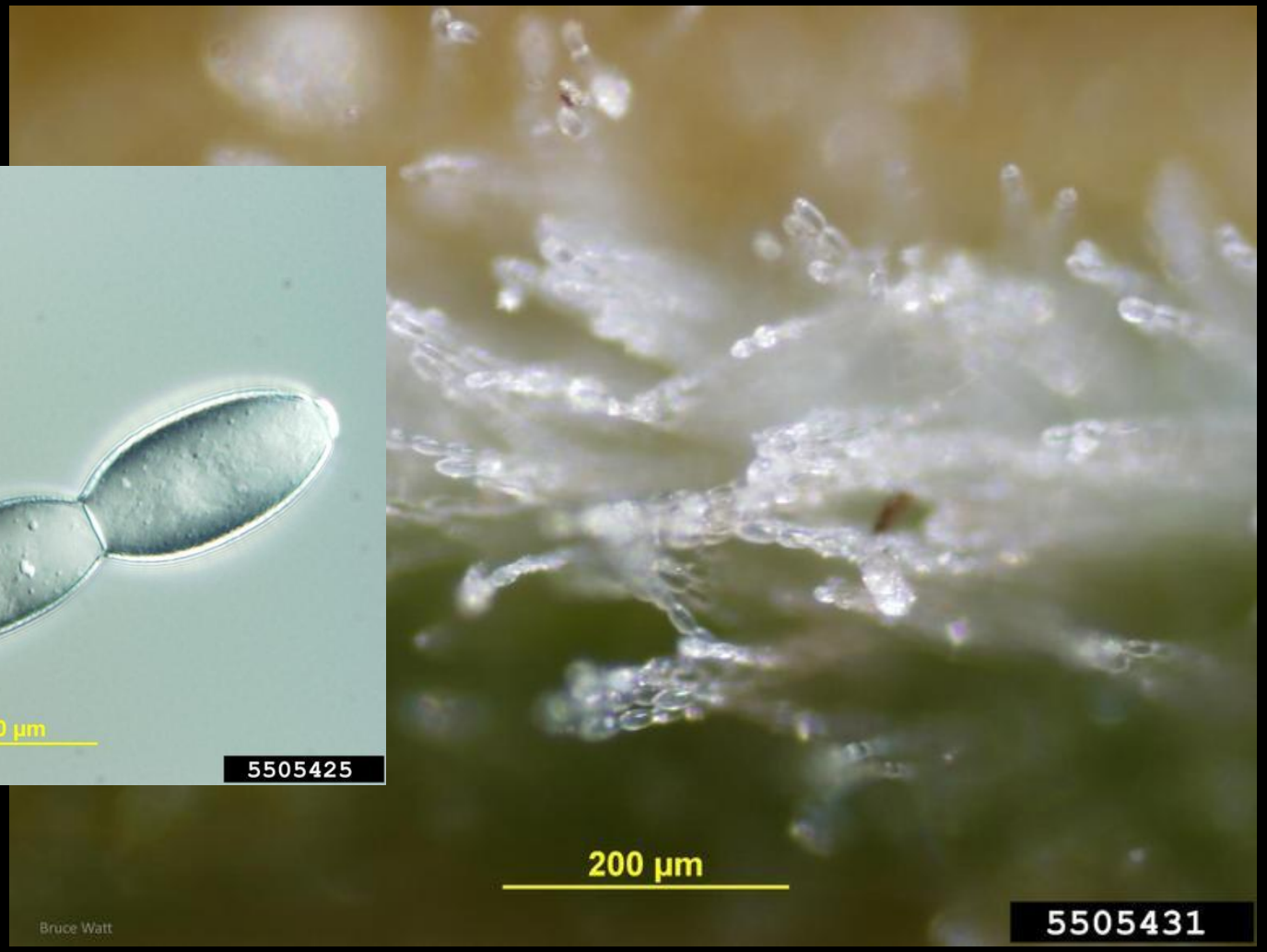
Xanthomonas translucens



Proß, S. and Bachmann, B., 2009. In *Proceedings of the 7th International Modelica Conference; Como; Italy; 20-22 September 2009*

Blumeria graminis





Where do plant diseases come from?

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In Season survival

Out of season survival

Where do plant diseases come from?
(to a certain extent true for pests)

As living organisms on plants














Where do plant diseases come from?

Out of season survival

As living organisms on plants – alternative hosts

In survival structures called fruiting bodies (for fungi)

On various substrates


Mary Burrows Montana State University Bugwood.org
5547986

How are plant diseases dispersed

Dissemination of bacteria by water

Dissemination powdery mildew by wind

Dissemination *Septoria tritici* leaf blotch by water

Mary Burrows Montana State University Bugwood.org

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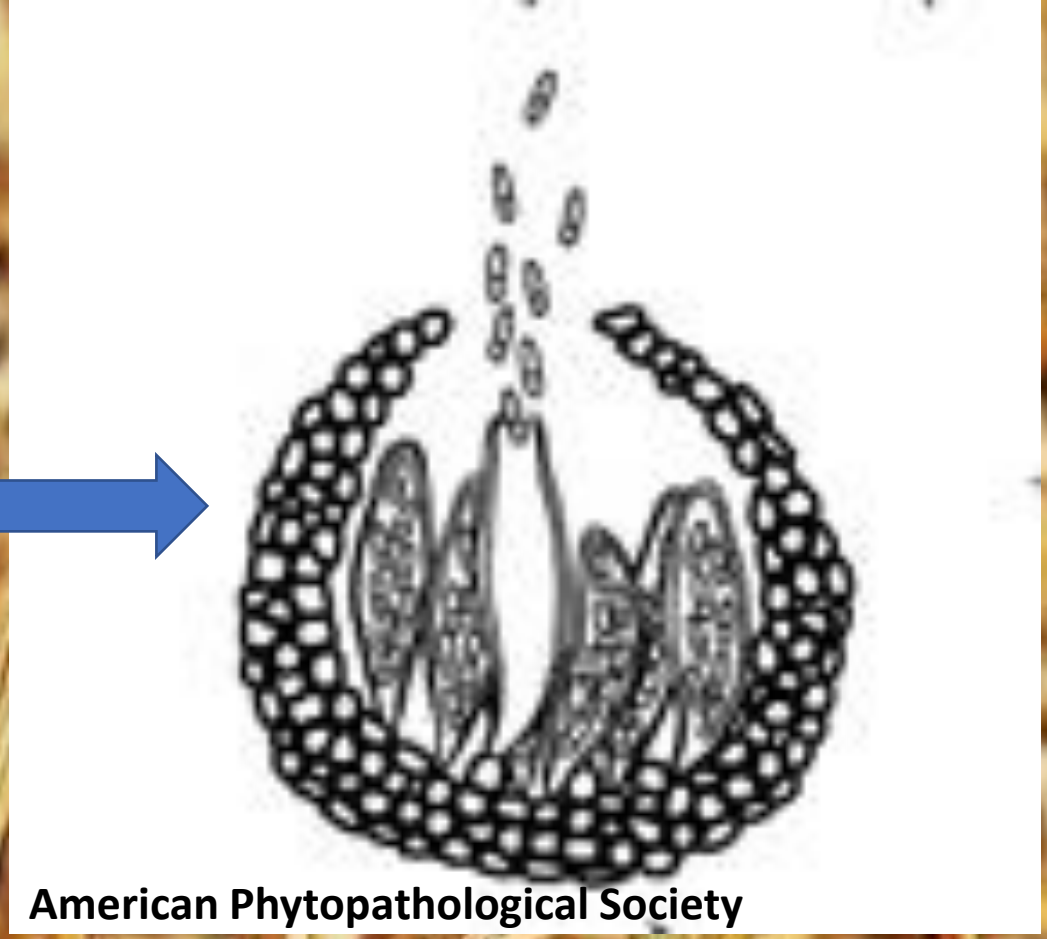
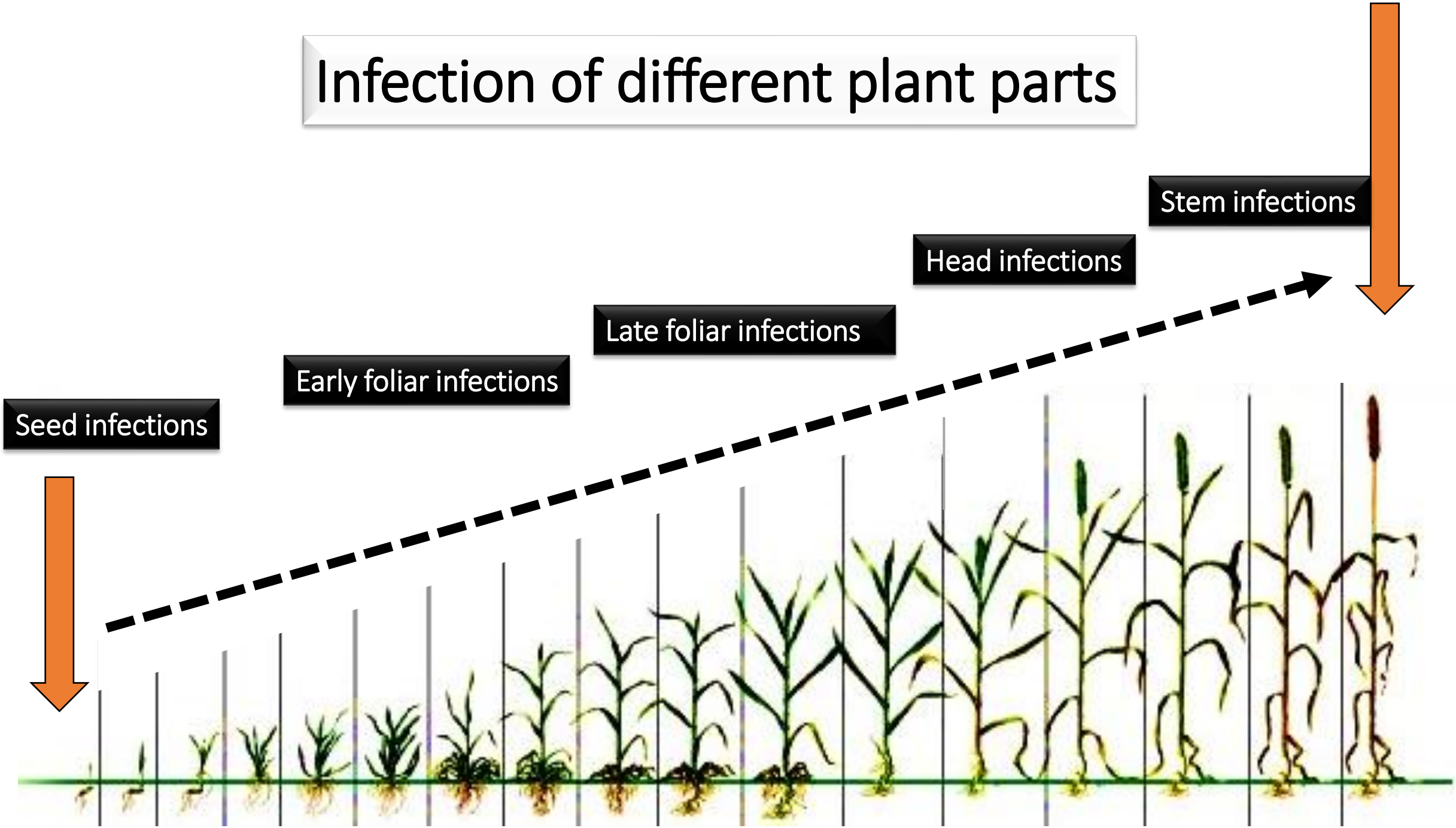


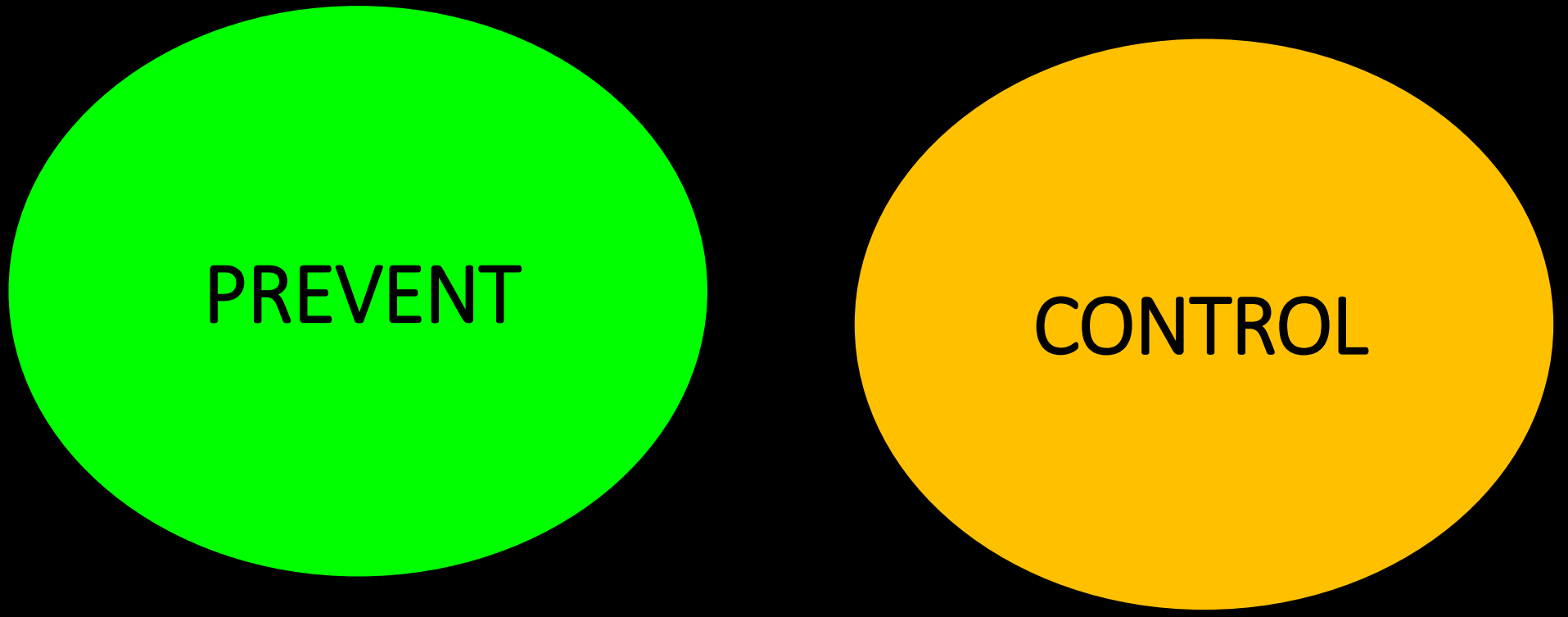
American Phytopathological Society

How do plant diseases infect plants?

Infection of different plant parts



How do I manage plant diseases?



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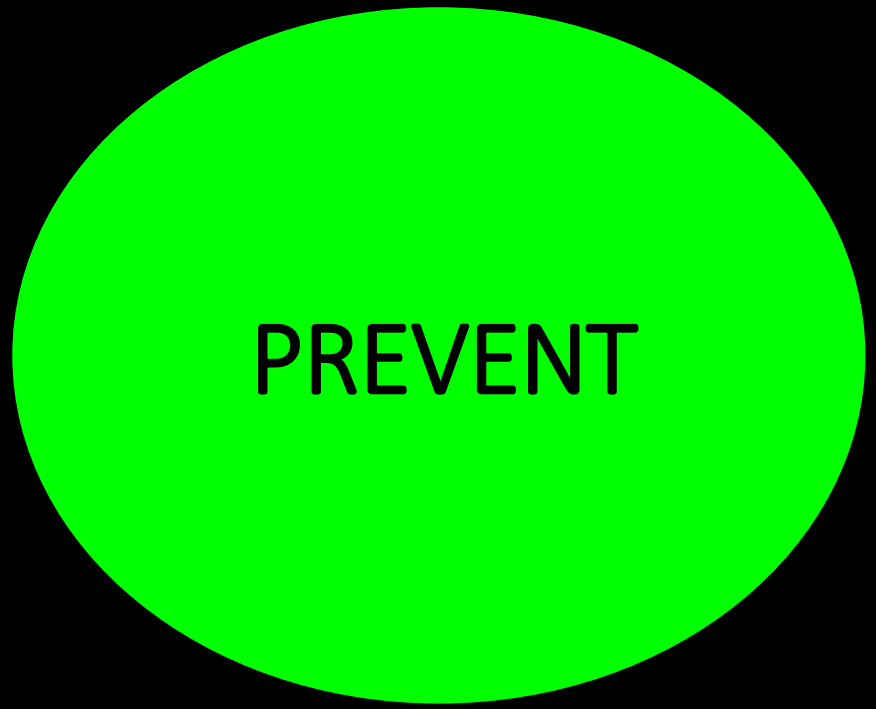
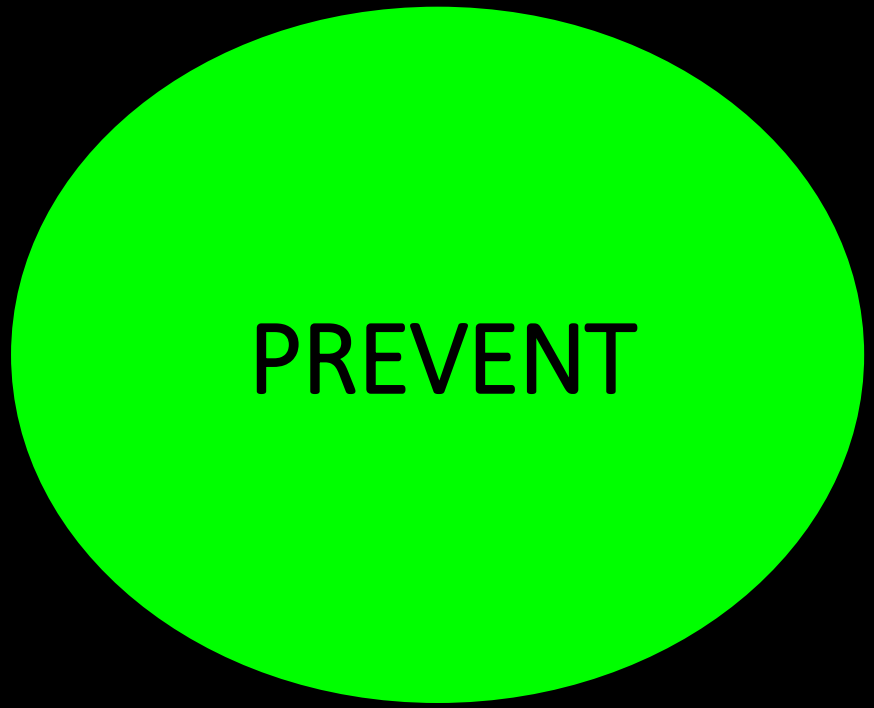


How do I manage plant diseases?
By pro-actively managing plant health



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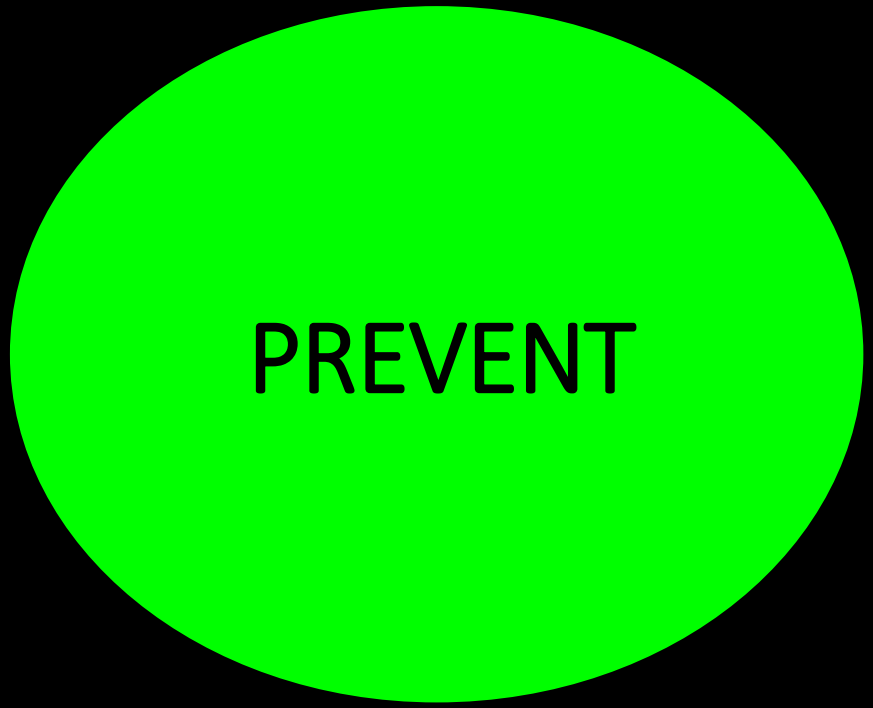


Healthy soil

Choice of variety

Quality and health of seed

Source of seed

Seed treatment

Seedling density

Fertiliser regime

Management of weeds

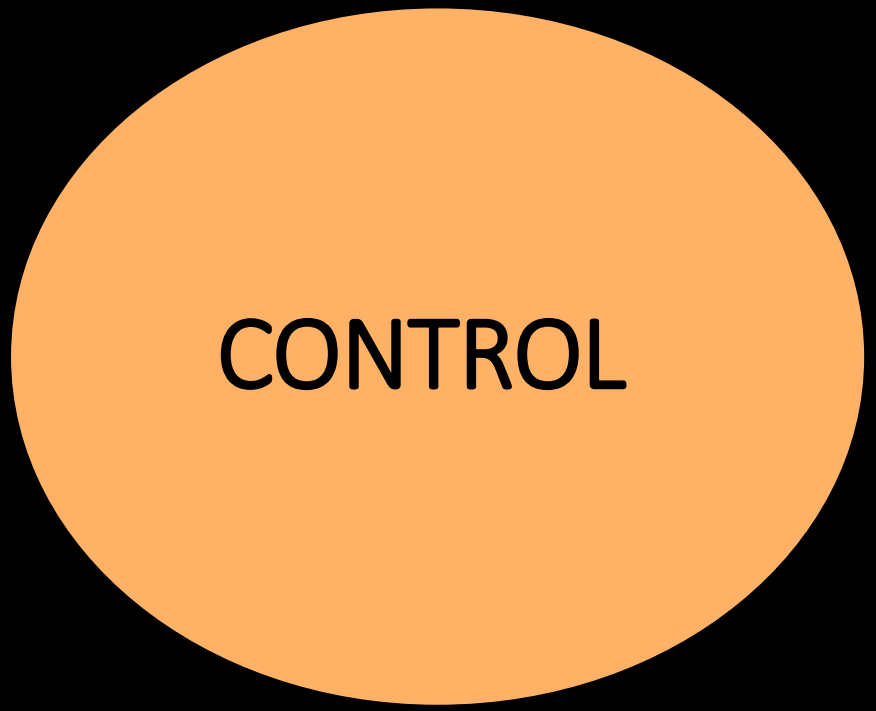
Vulnerable

Lower risk by lowering vulnerability

An option found me: Crop4Life

Soil health
Soil structure
Genetics of plant material
Type of irrigation (if applied)
Quality of water
Climate

How do I manage plant pests and diseases?



Scouting

Correct identification

Use registered products for control

Apply products timely

Apply products at the correct dosages

Rotate the of the mode of action of products

Options for control seem to be failing

CONTROL

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Bottomline

Protecting plants from injury is **more difficult than ever**

- Climate change
- The world today –input costs rising
- Choices to be made
- New “problems” constantly on the horizon
- Vulnerability of plants are high
- Risk is high
- Need to lower plant vulnerability by actively promoting plant health

Lowering vulnerability

An option found me: Crop4Life

Lowering vulnerability

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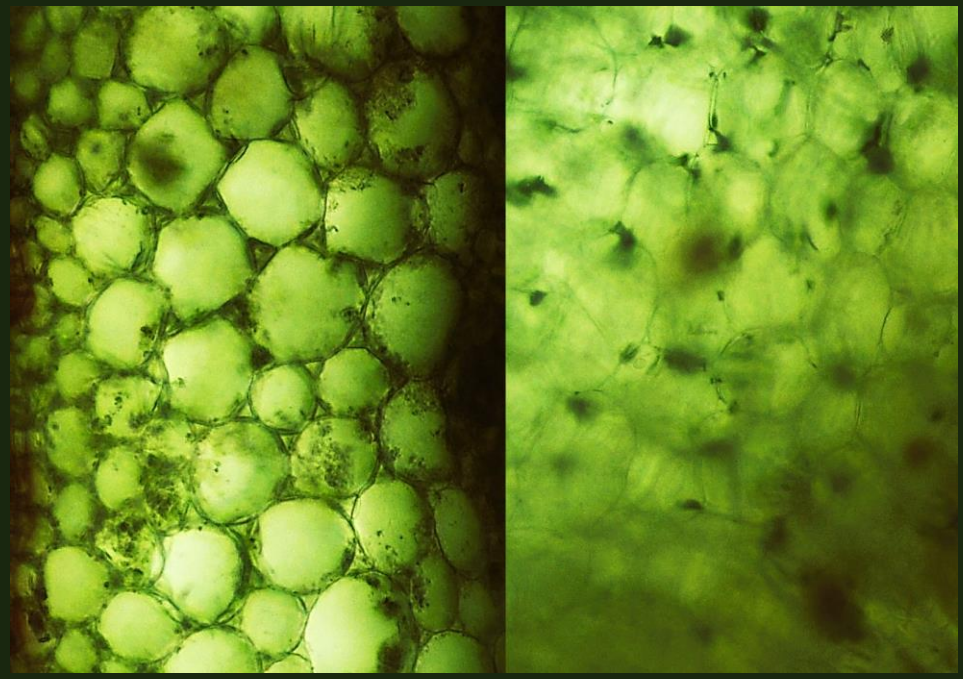

Lowering vulnerability

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Hallo Laubser PhD tesis Stellenbosch University

Increase the yield & quality of crops

Reduces need for toxic inputs

Increases water use efficiency

Protect & enhances soil health

Bio Revolution

Enables genetic potential of crop

Unparalleled technology

Reduces food waste

Enhance microbiome, root growth & carbon sequestration

ida@biorevolution.co.za