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the seed enhancement company

Part of Croda International Plc

Change, adapt and innovate

Mitigation of Abiotic Stress in young plants

September 2023

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Todays presentors

- **Rob Pronk**
- PhD Biochemistry
- Marketing Manager Incotec
- Eager to scout for new opportunities

- **Barry Hoff**
- Biotechnologist
- Research Scientist
- Leave the world better than I found it

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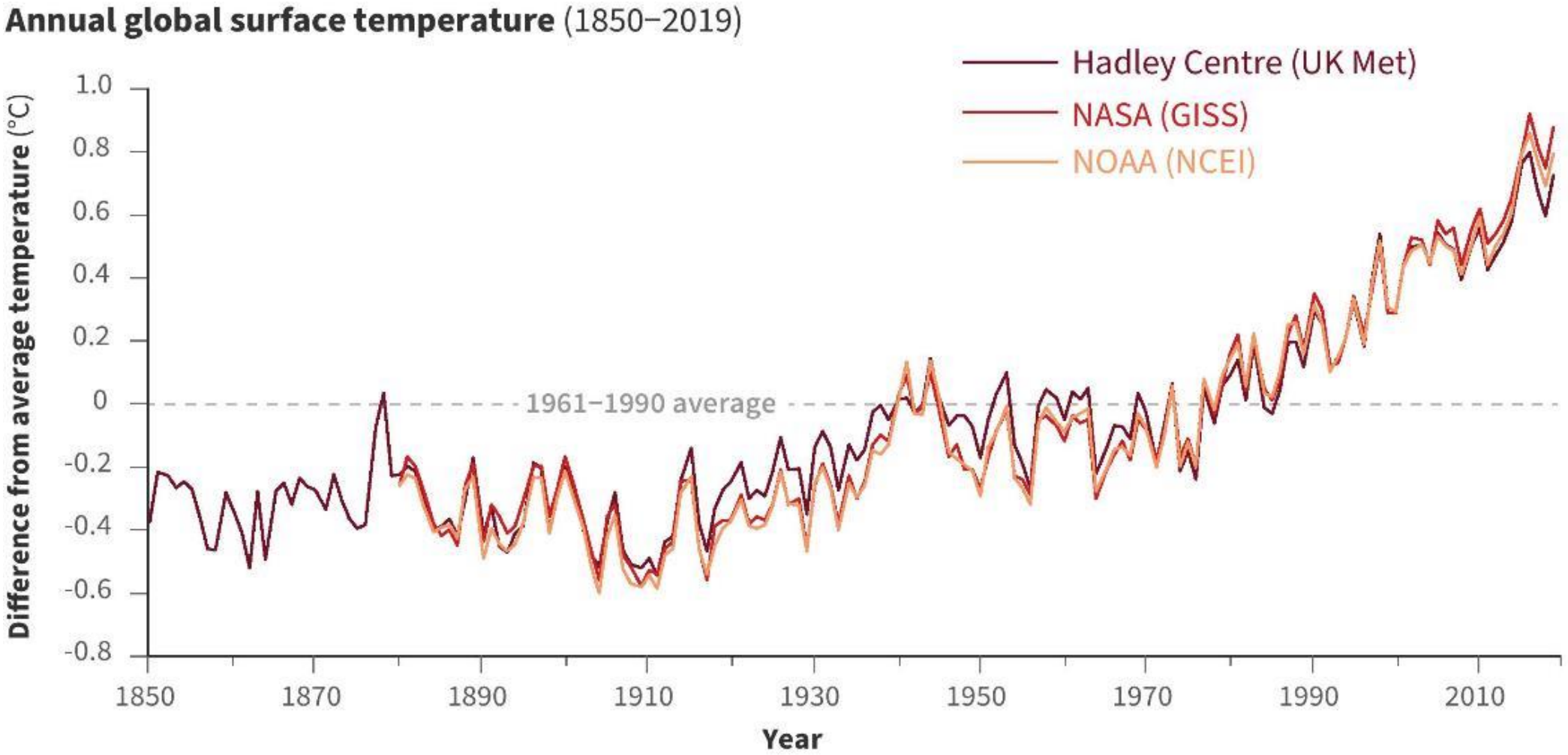
Climate is changing



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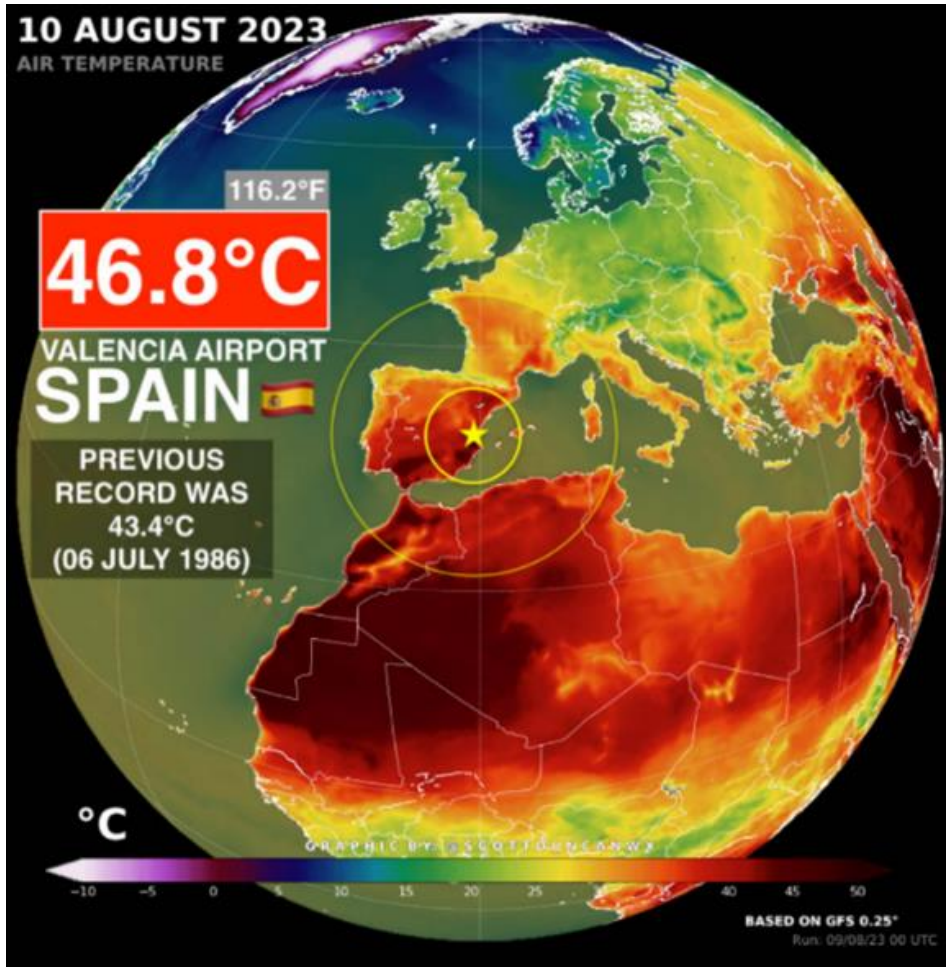
Climate is changing



Climate is changing

Europe facing its worst drought in 500 years, European Drought Observatory report states

Posted Wed 24 Aug 2022 at 6:25am, updated Wed 24 Aug 2022 at 3:39pm

CLIMATE & ENVIRONMENT

What's driving the massive, destructive rainfalls around the country

'The infrastructure we have is really built for a climate we are not living in anymore,' said one scientist who studies extreme precipitation

By Brady Dennis

August 6, 2022 at 2:31 p.m. EDT

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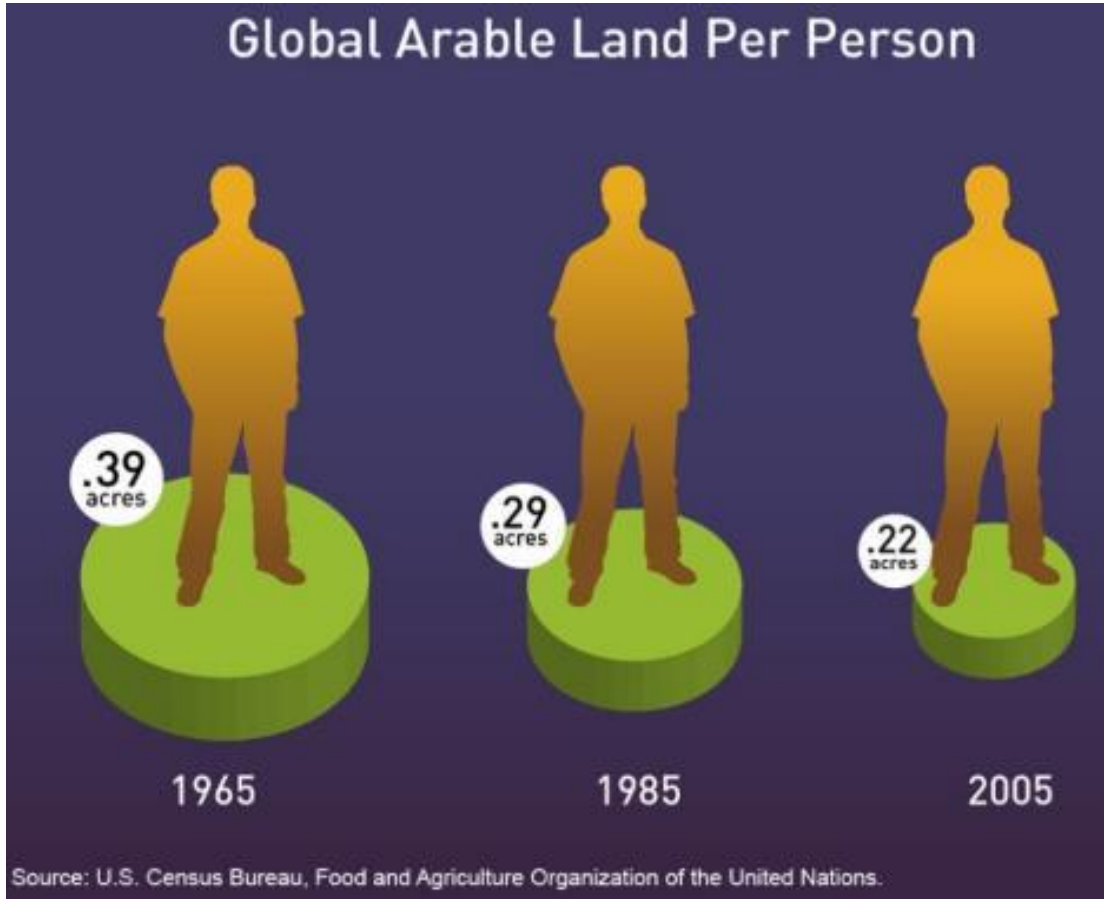
And if that weren't enough....



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In summary…we're not short in challenges…

+32%

Global population[1]

>60%

Food demand[1]

=

Agricultural land

-50%

Pesticide use[2]

?

Climate change effect on yields

Challenge to produce more with less

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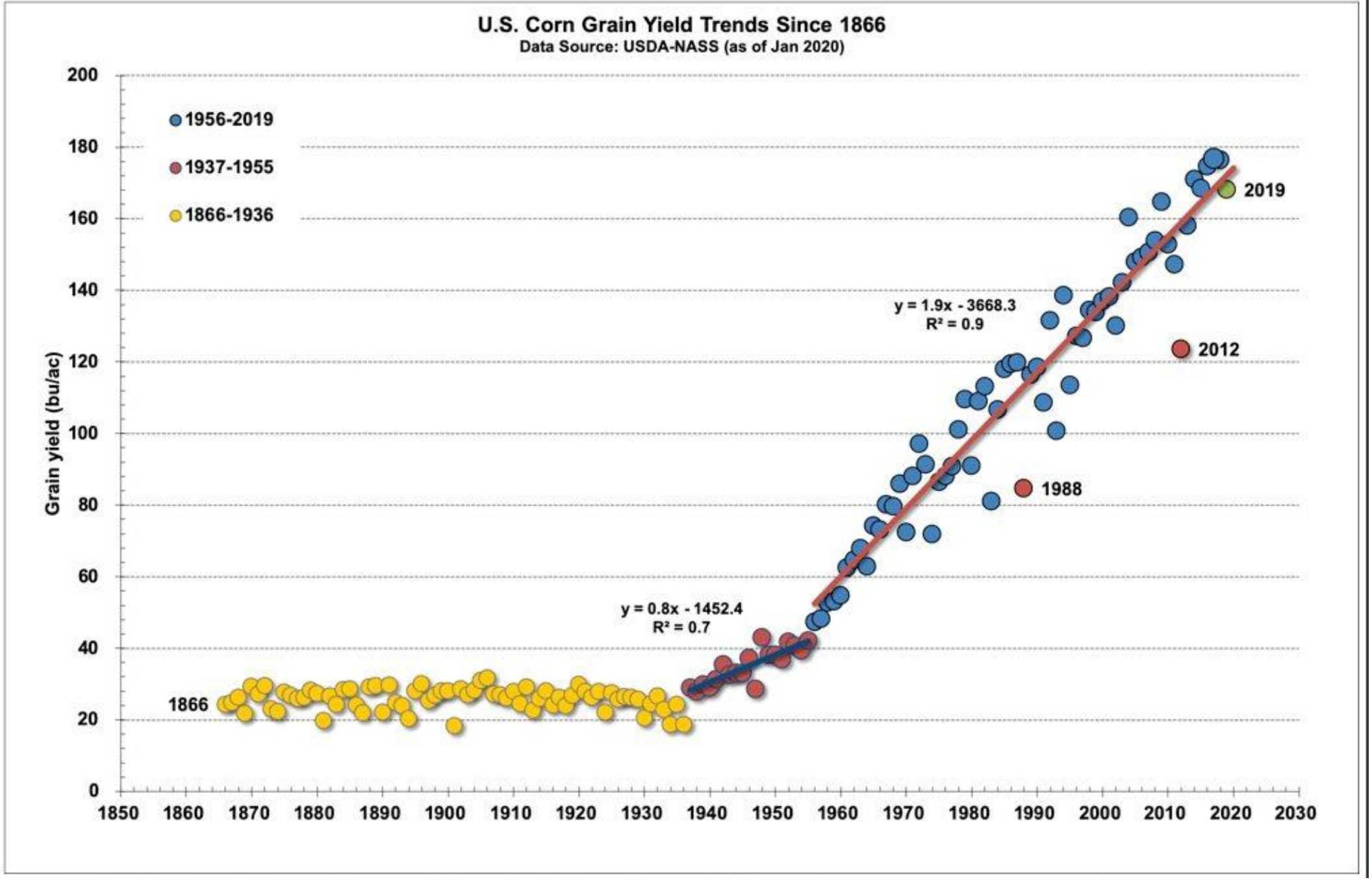
U.S. Corn Grain Yield Trends Since 1866
Data Source: USDA-NASS (as of Jan 2020)
1956-2019
1937-1955
1866-1936
y = 1.9x - 3668.3
R² = 0.9
y = 0.8x - 1452.4
R² = 0.7
2019
2012
1988
1866
Grain yield (bu/ac)
0
20
40
60
80
100
120
140
160
180
200
1850
1860
1870
1880
1890
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010
2020
2030

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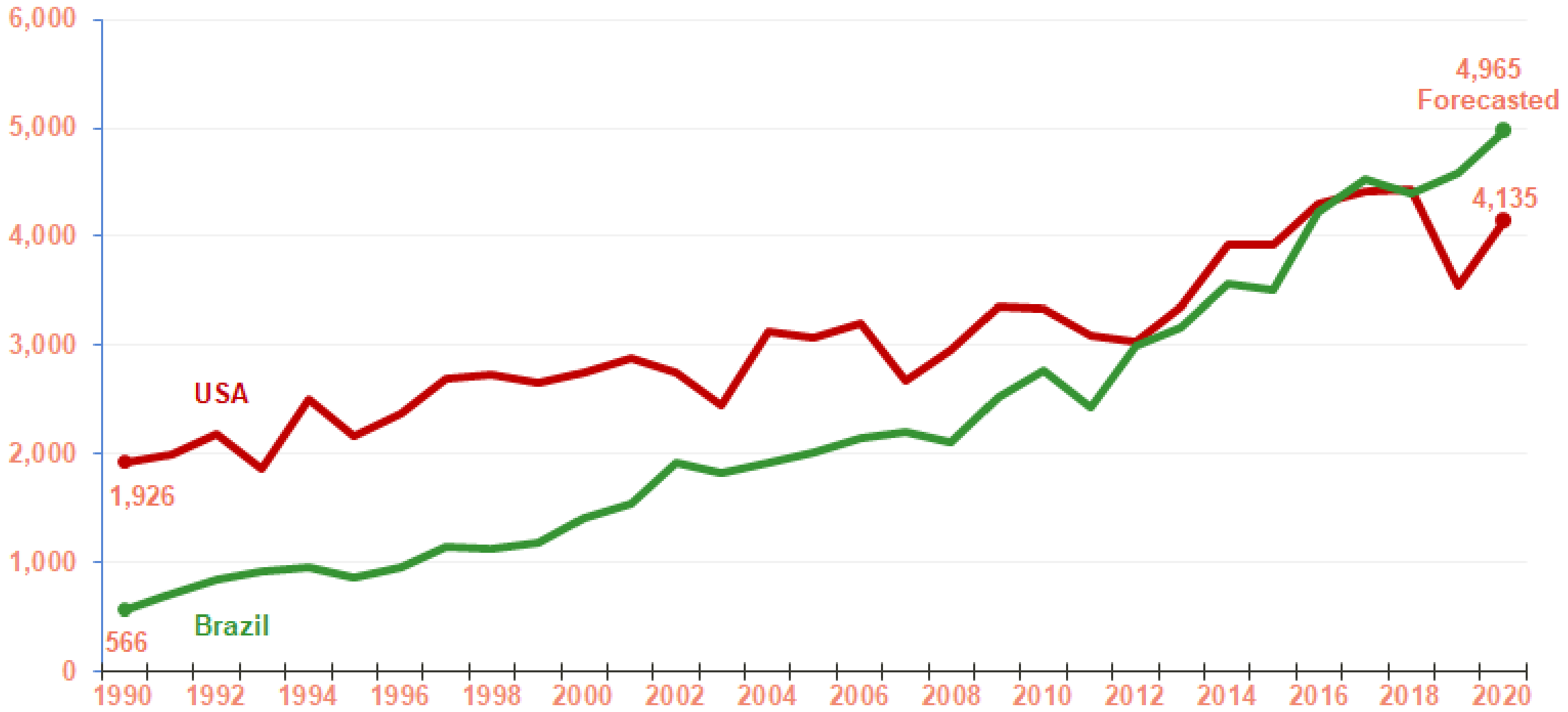
Figure 1. Soybean Production in Million Bushels

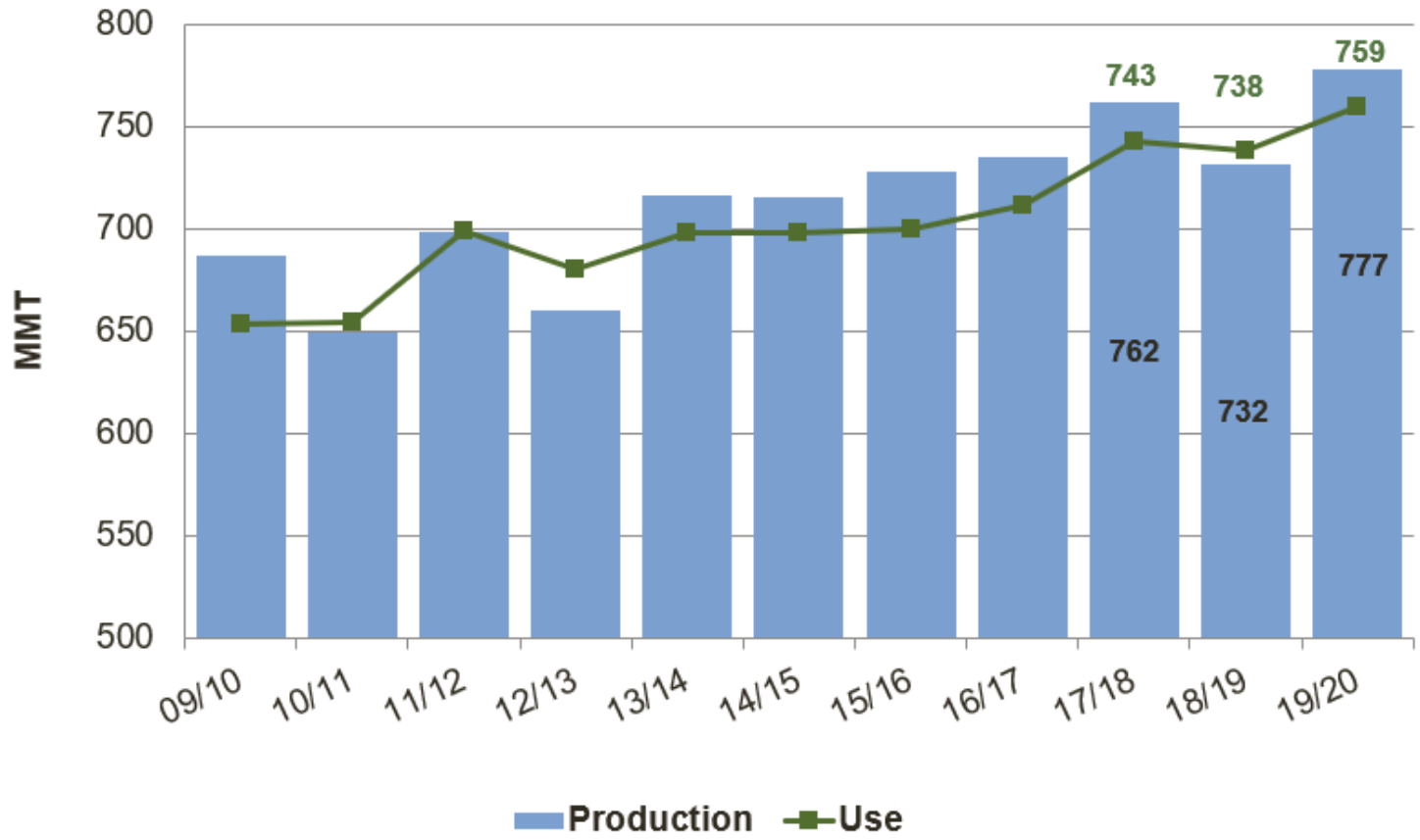


ILLINOIS

Sources: Conab and USDA

farmdocDAILY

World Production and Use



Supply and Demand

U.S. WHEAT ASSOCIATES

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Conclusion

- Agricultural regions face impact climate change
- We are finding solutions which counter stress
- Throughout life cycle of plant

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Stress factors

Abiotic stress

negative impact
from non-living factors

- Drought
- Flood
- Salinity
- Temperature
- Wind
- Toxins

Biotic stress

negative impact
from living factors

- Bacteria
- Fungi
- Viruses
- Insects
- Herbivores

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Goal

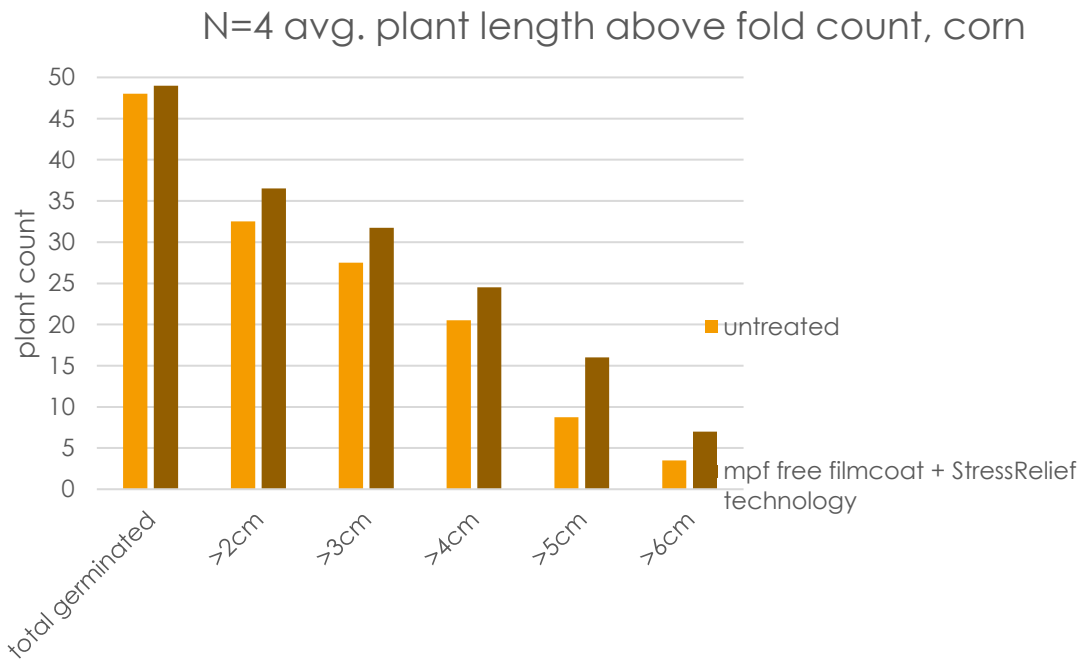
- Identify an additive to be incorporated in seed treatment
- To help young plants overcome abiotic stress
- Thereby improving yield in case of stress

In short

Develop seed treatments to mitigate the abiotic stress effect on young plants

What do we need ?

1. 2. 3. 4. 5.



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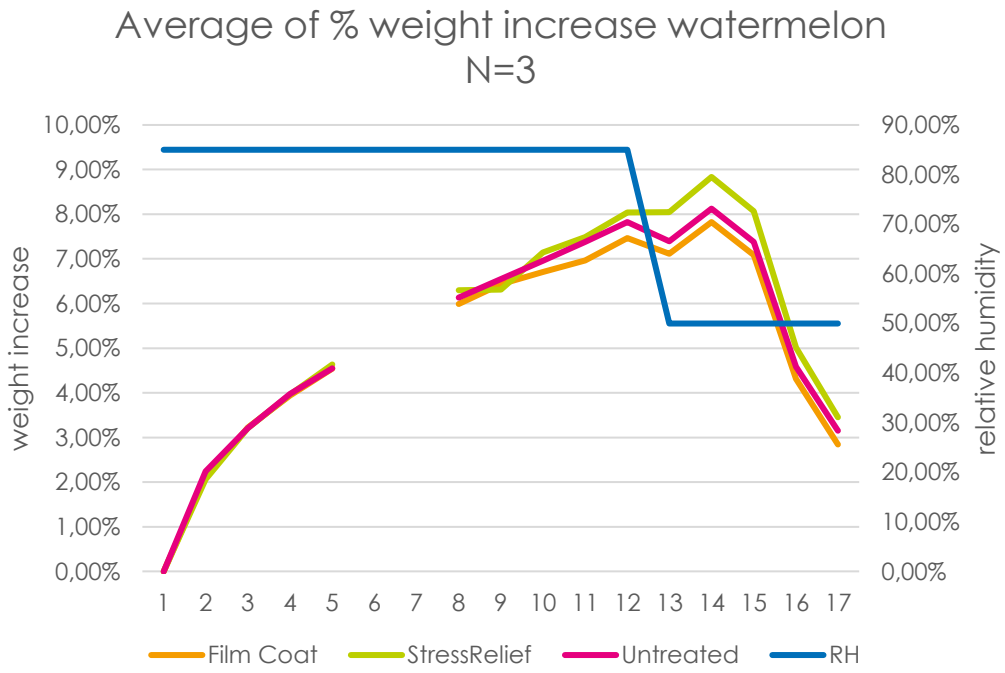
Quiz case study osmotic stress testing corn

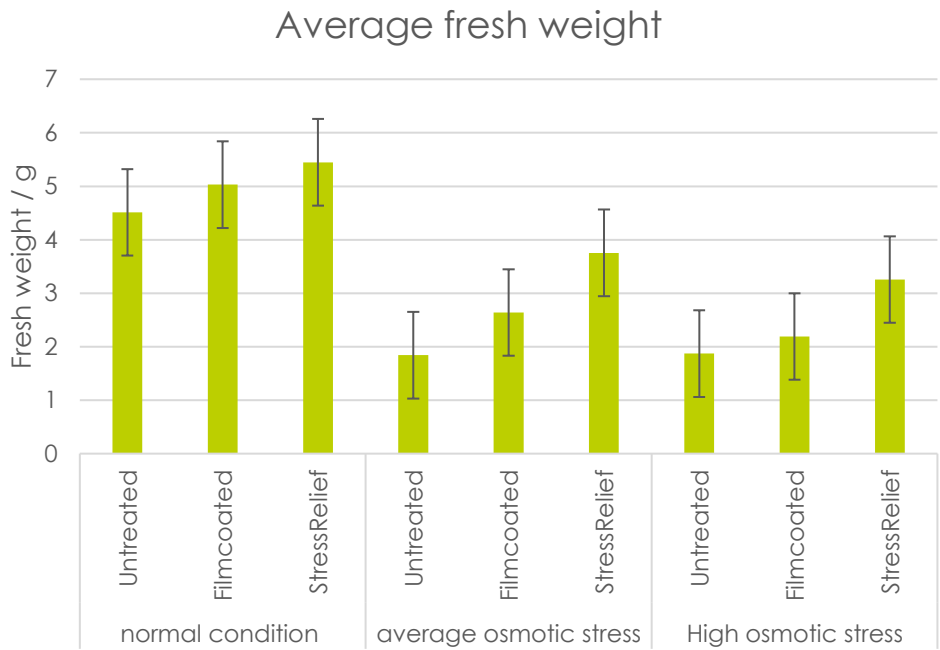
1. **What do we use as a growing medium?**
   a. (folded) paper
   b. potted soil

2. **What are the moisture conditions?**
   a. H2O or watering once
   b. using a hydrophilic polymer

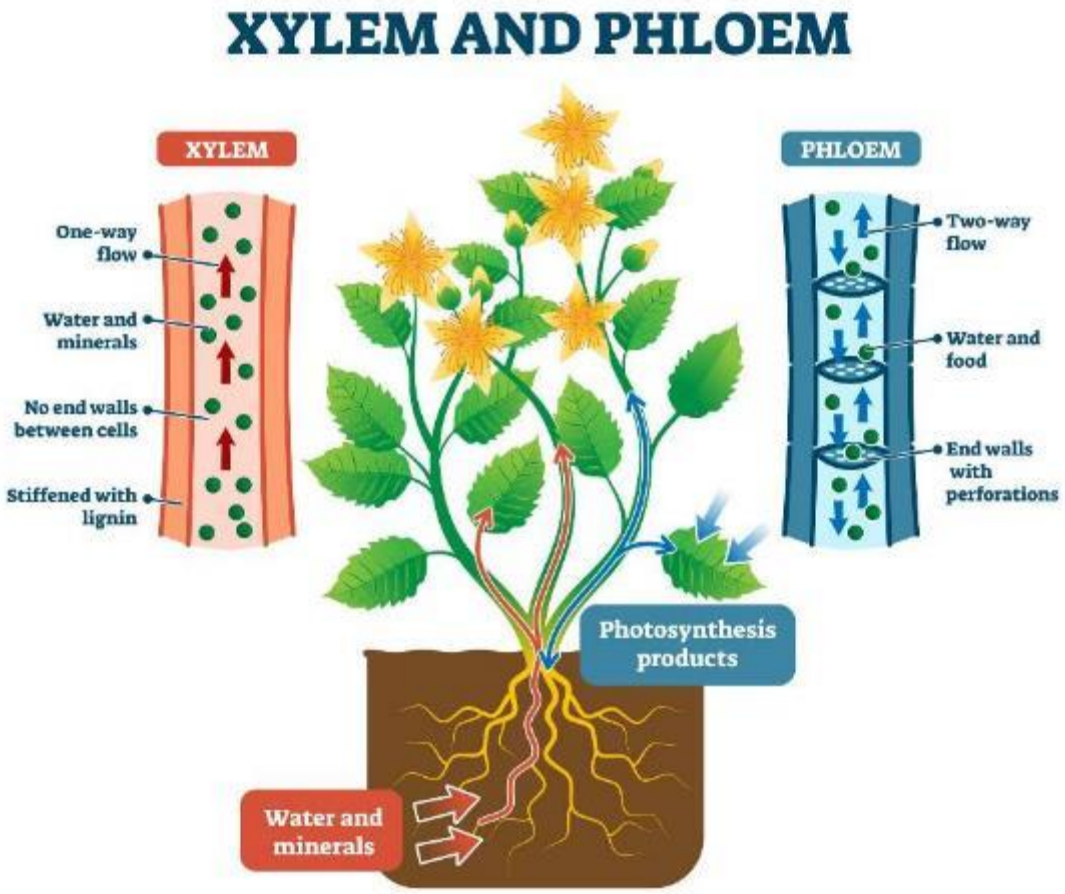
3. **How do we score our test?**
   a. average plant + leaf length
   b. fresh and dry biomass

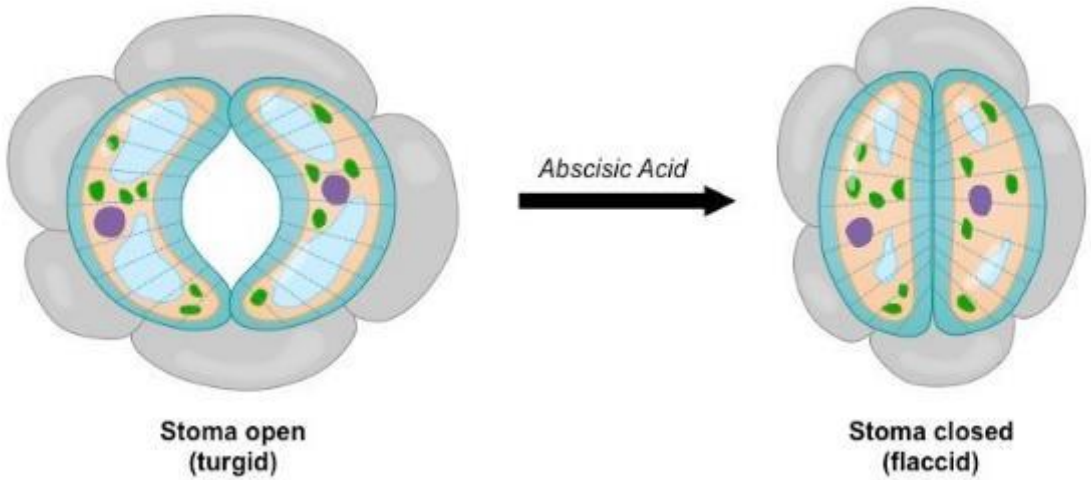
Mode of action research, case StressRelief ™



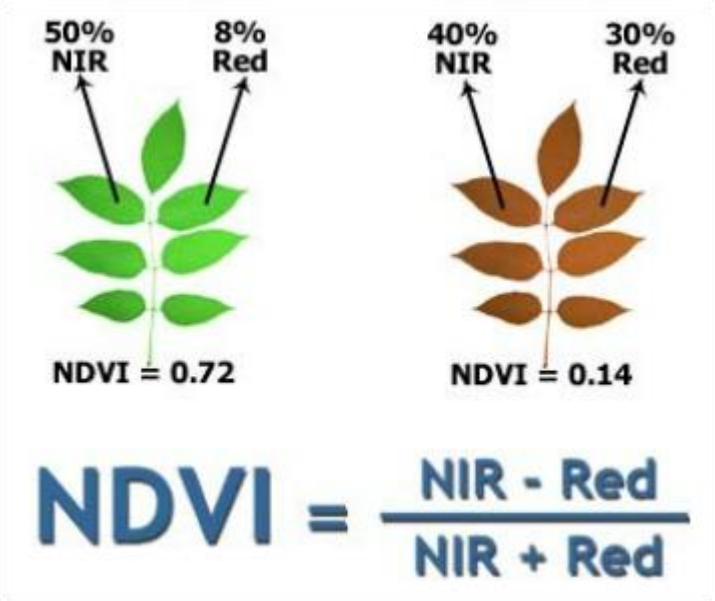


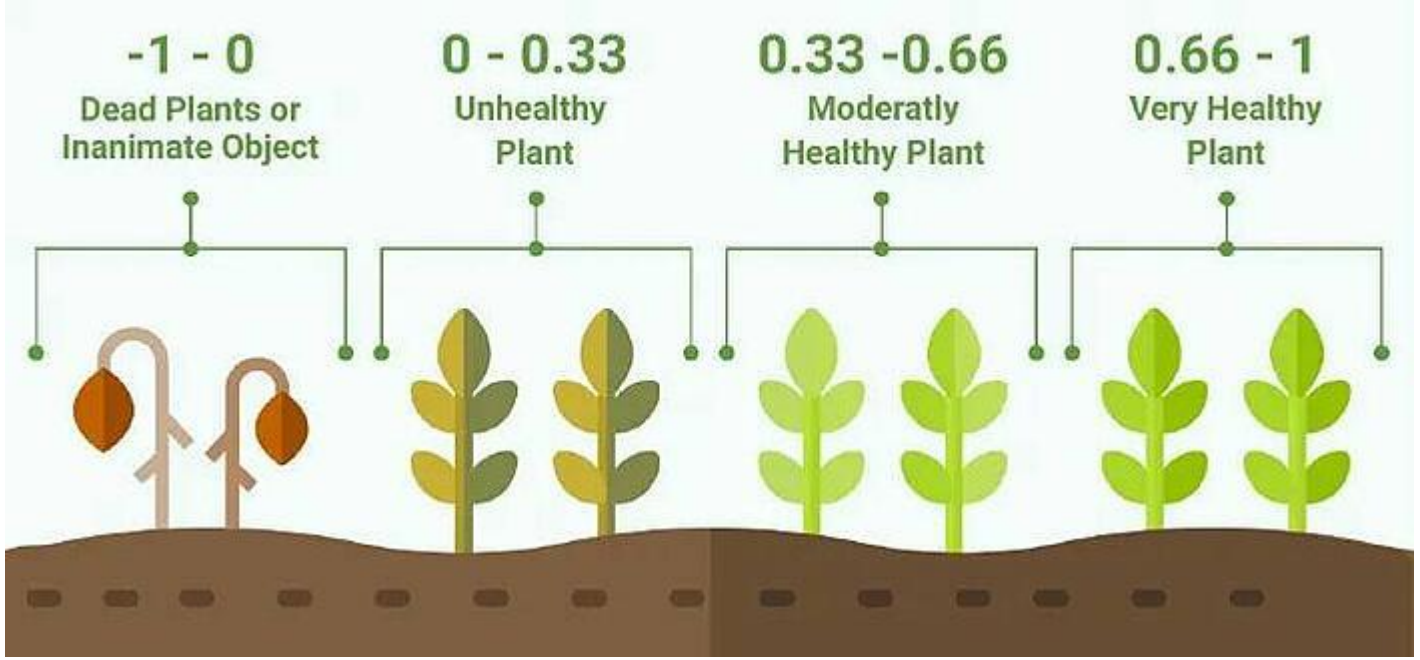
Can we adapt our stress testing?





NDVI imaging and analysis





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To bring it all into practice

Do you face any challenges like salinity, drought, cold, moisture or heat? We are happy to share our experiences

Together we can make our sector sustainable and future proof

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