NMBU

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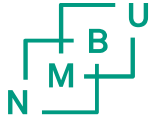
Robotic Platform for field phenotyping

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NPPN field day

17th June 2020

"I choose a lazy person to do a hard job.
Because a lazy person will find an easy way to do it."
~ Bill Gates

- Remote platforms allow us to do things "smart" by reducing (direct) human input…
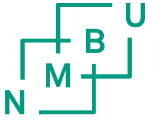
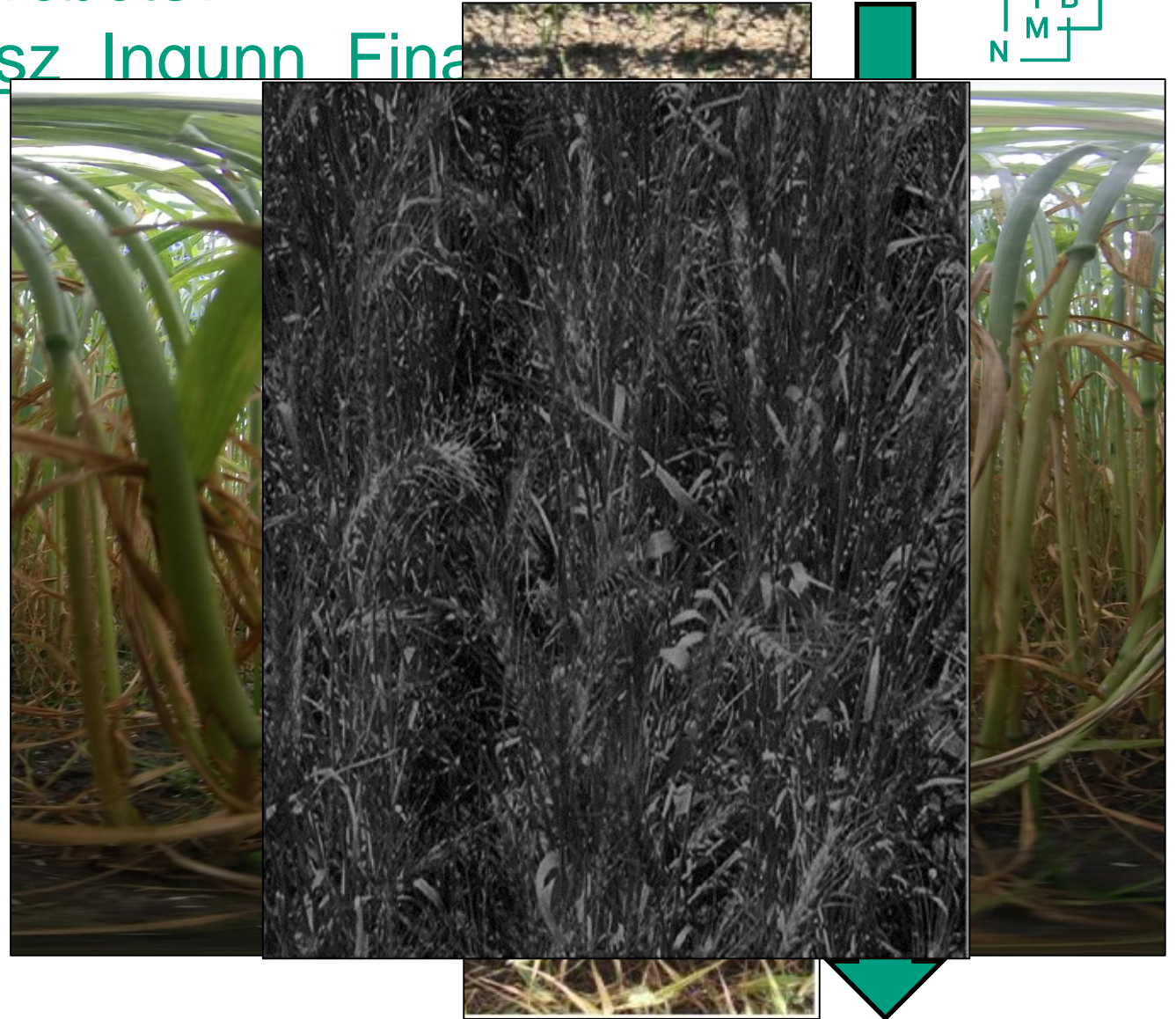- And do even more "smart" things, impossible before

Thorvald II robotic platform

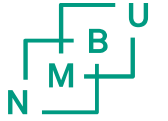# Movie Link

What data do we collect with robots?
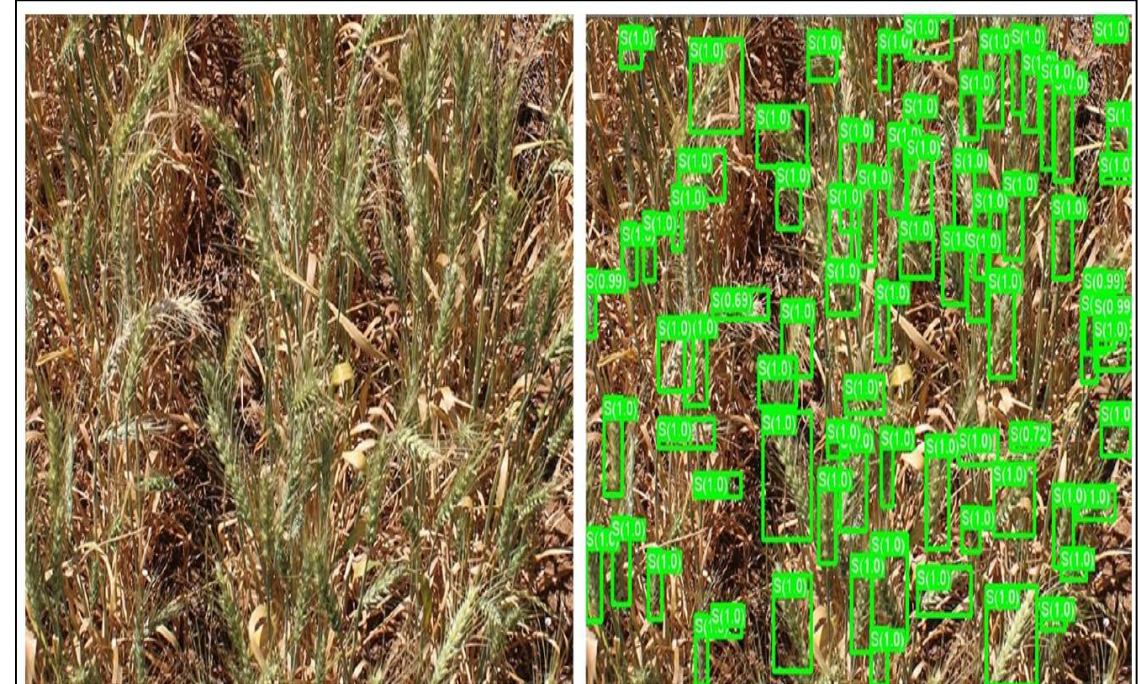C:\Users\tomr\Desktop\Tomasz_Ingunn_Fina

- Complementary to drone imaging

- Visual (RGB):

  - Top-down, high resolution

  - 360º inside the canopy

- Near infra-red (NIR) top-down

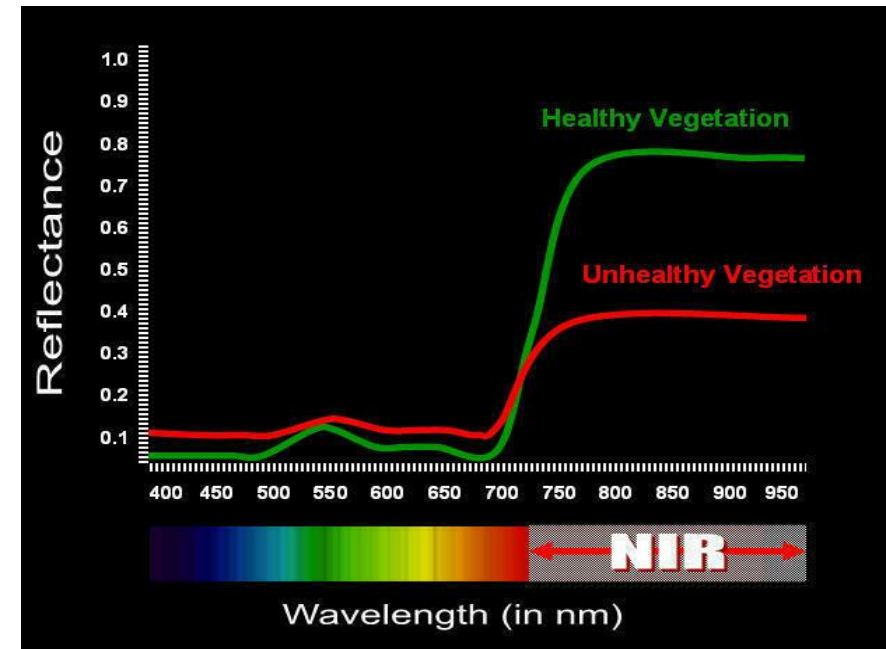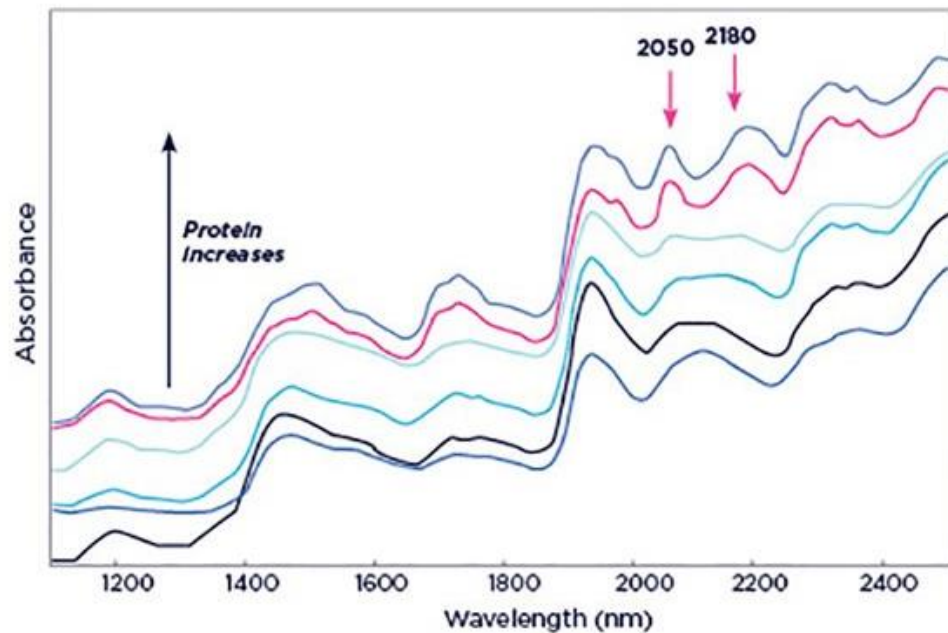# How can we transfer this data to knowledge?

- Top down RGB images:
  - Estimation of growth stage
  - Number of heads
  - Spike size and properties
  - Stress/disease signs (chlorosis etc.)
- 360 images
  - Canopy architecture
  - Disease signs

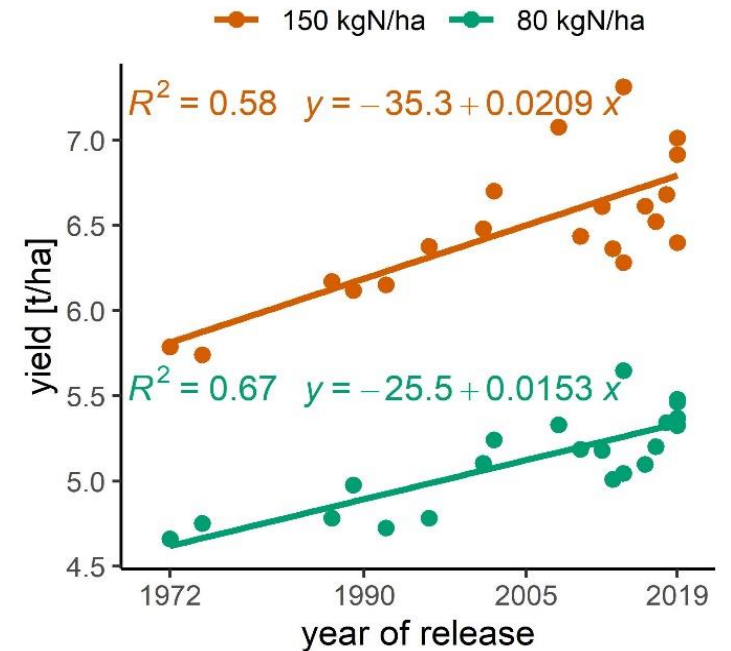# How can we transfer this data to knowledge?

- NIR images
    - Nitrogen (protein) content in the canopy
    - Stress (physiological state)

Source: es.abvista.com

tetracam.com

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How can we transfer this data to knowledge?

- Case study:
  Historical yield and trait genetic gains in
  Norwegian spring wheat (Mroz et al, in prep.)
- Involved manual phenotyping
- Use robot images to:
  - Estimate the number of heads per area
  - Estimate presence of nitrogen stress
  - Estimate protein content in the canopy
  - Look into canopy architecture
  - Determine growth stage

How can we transfer this data to knowledge?

NIR

Indirect
RGB + manual

RGB

3D RGB

multispectral