ISTA Seed Health Symposium 2014

Videometer demonstration

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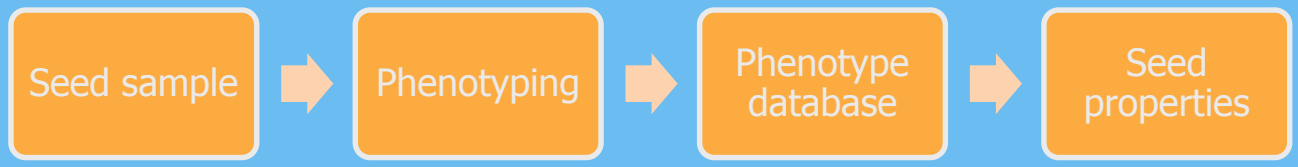
Use case video – in the maltery

How does spectral imaging fit in?

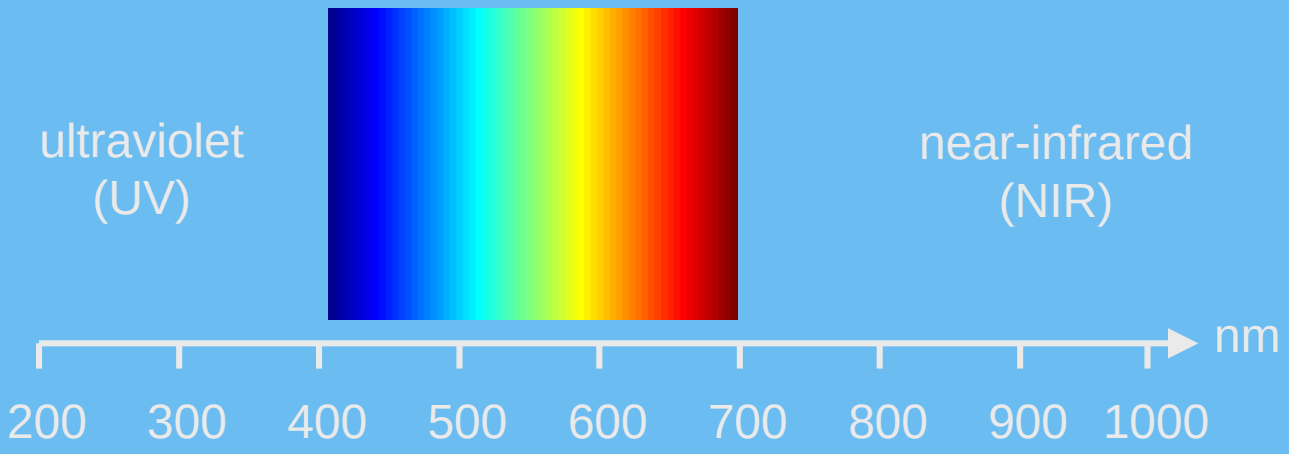


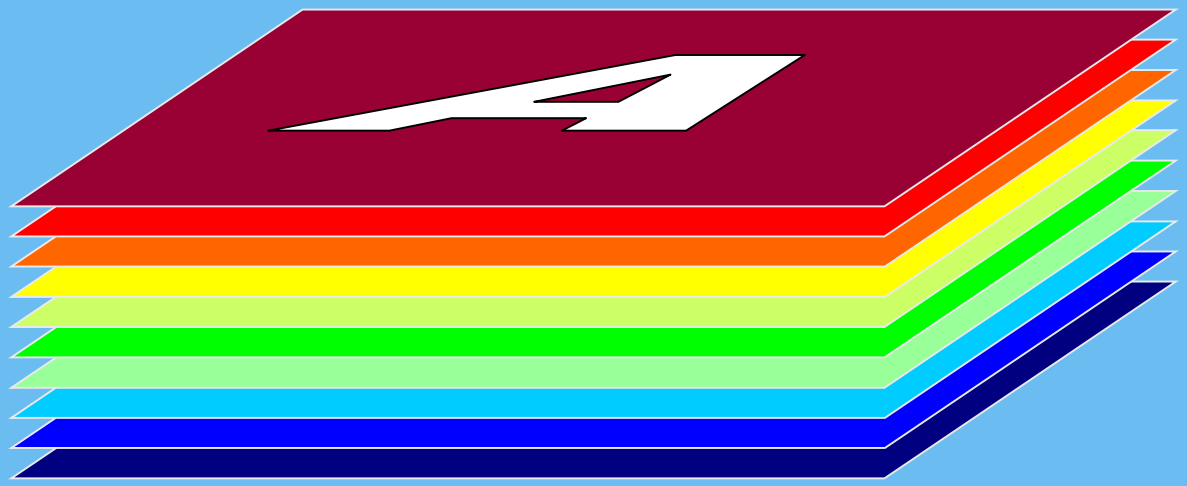
Spectral imaging

SpectraSeed
TESTA
SAGT

Purity
Germination
Vigour
Pathogen genotypes
...

Band-sequential spectral imaging

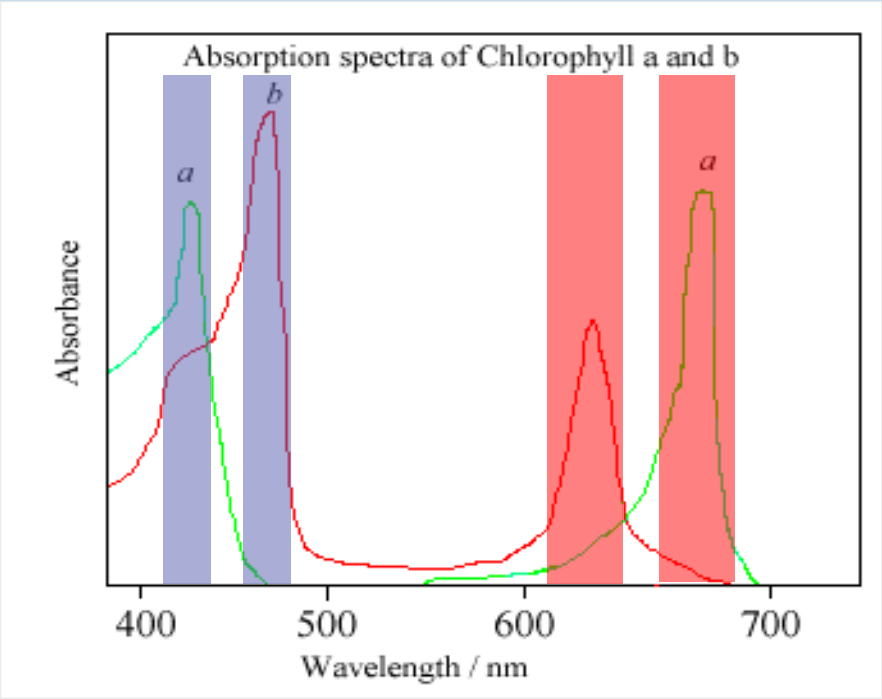




N images obtained at N specific wavelengths

Advantage of multiple wavelengths

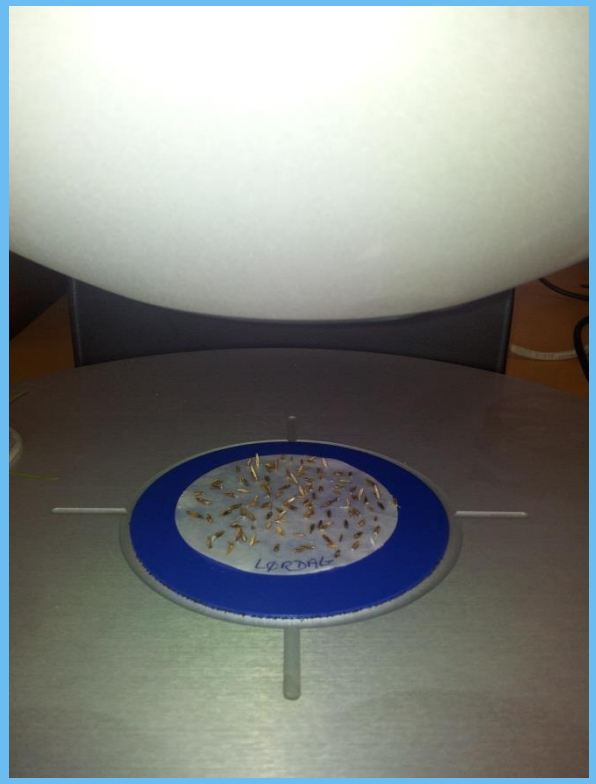
Using specific wavelengths for imaging, chlorophyll a and b can easily be distinguished



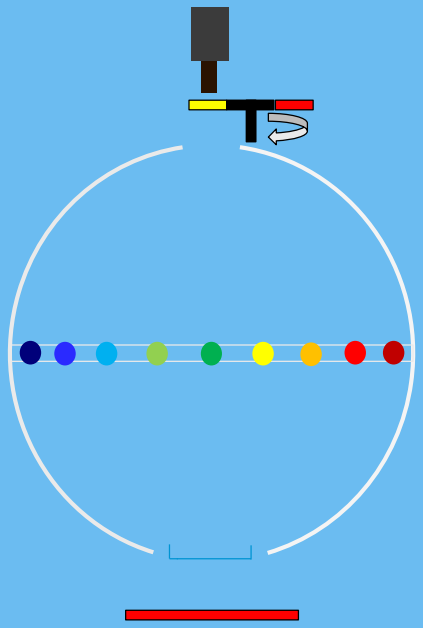
Chl.A	low	high	high	low
Chl.B	high	low	low	high

Spectral Imaging

- Rapid, non-destructive measurement
- 10-20 seconds per sample
- May easily be combined with other measurements – even destructive techniques
- High versatility measurement
- Focus on
  - Reproducability
  - Traceability
  - Robustness
  - Transferability



Videometer BSQ Spectral Imaging



Camera and lens

Emission filter changer

Integrating sphere

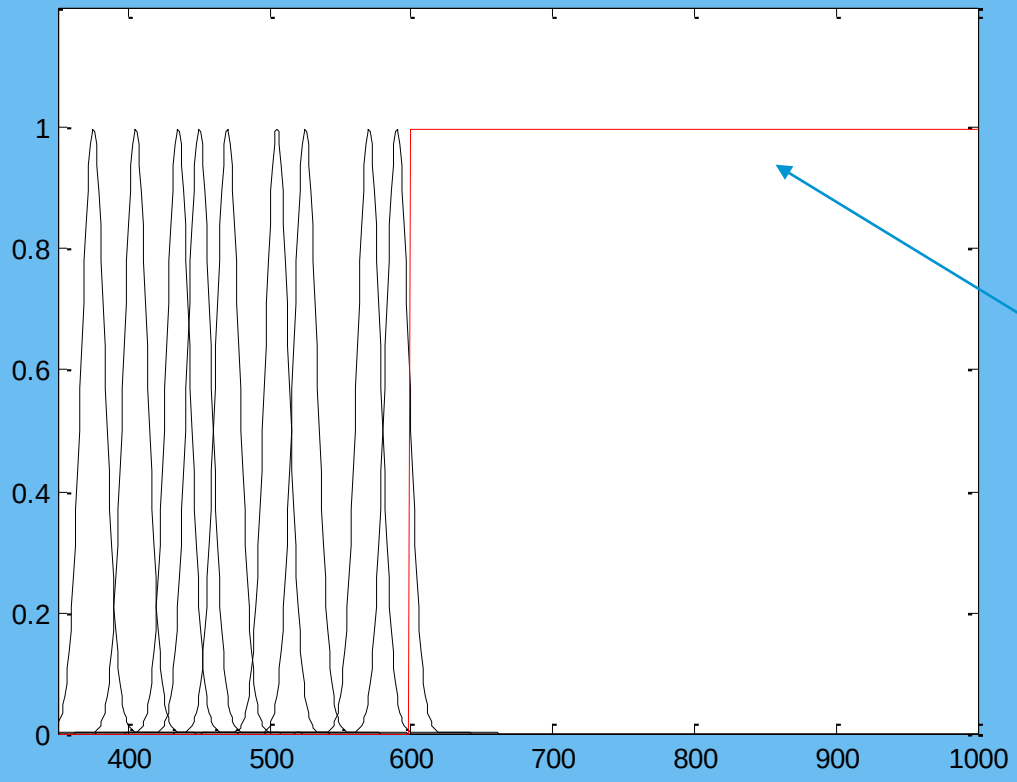
LEDs of multiple wavelengths

Sample is placed in target opening

Backlight or background

- LEDs: Stable, durable, large selection, rapidly developing technology
- Up to 20 different high-resolution bands acquired sequentially in 0.5-1.5 seconds depending on camera
- May be combined with emission filters, backlight, and darkfield illuminant

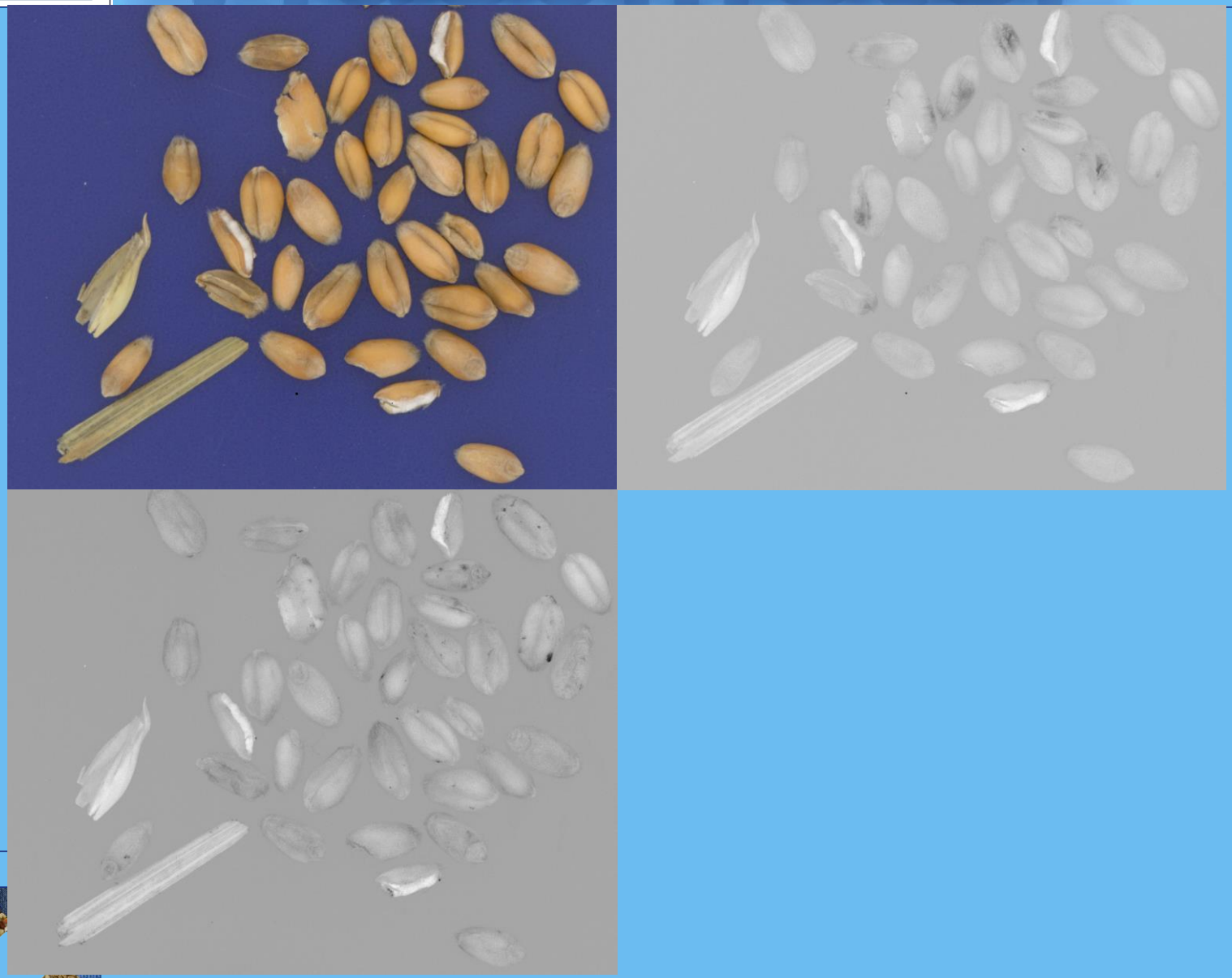
Multispectral fluorescence



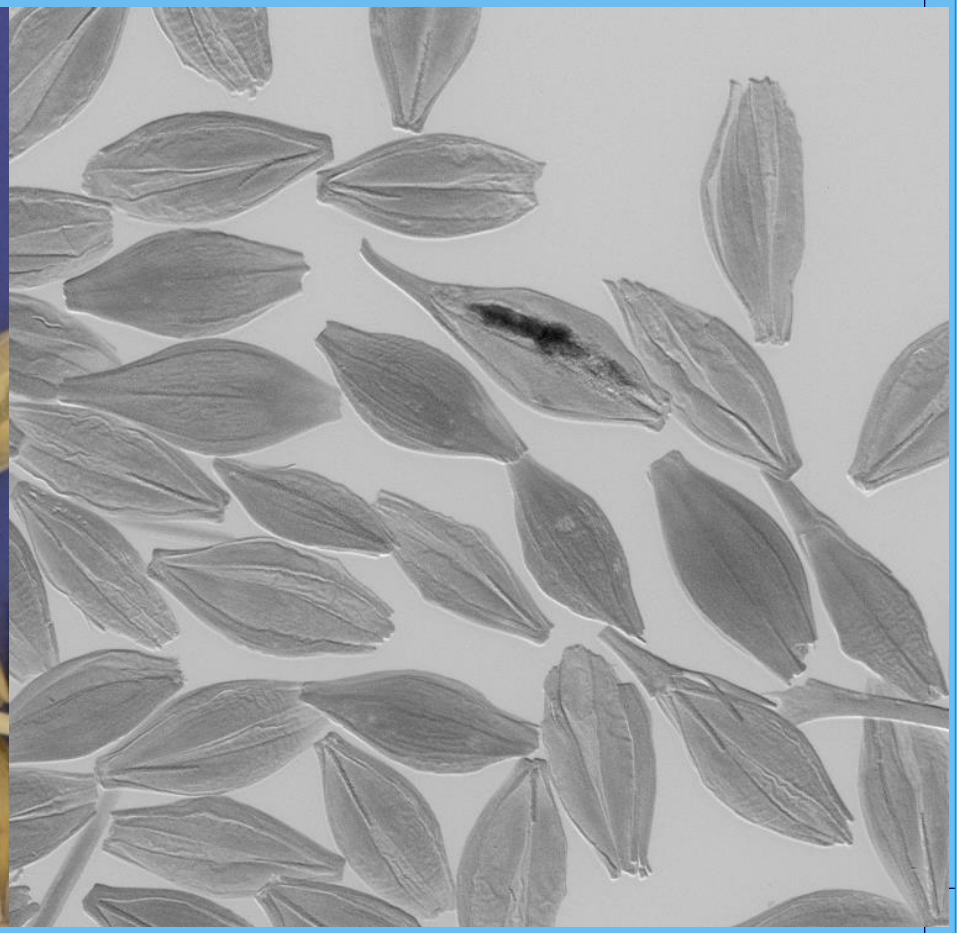
Long pass emission filter (up to 5)

LED strobes

Wheat with Bunt 4 spores per seed



Fusarium fluorescence



Conclusions / Acknowledgement

- Spectral imaging is a useful tool for seed and pathogen phenotyping
- A global on-line phenotype database like SpectraSeed will increase the usefulness by cross-linking experience gathered by many labs
- This work has received funding from EU FP7 agreement no 289108 (TESTA project) and the Danish Advanced Technology Foundation (SpectraSeed project)