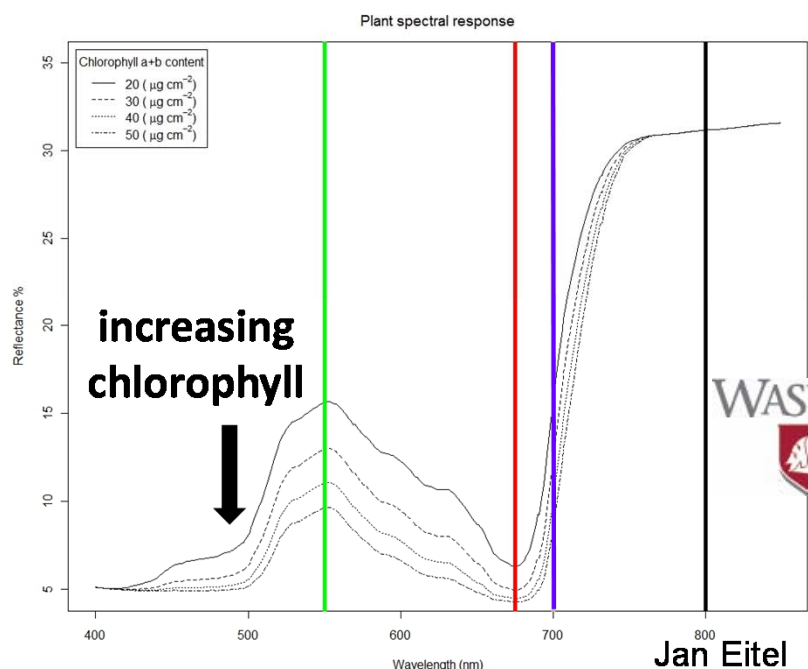


• **Normalized Difference Red Edge (NDRE)**



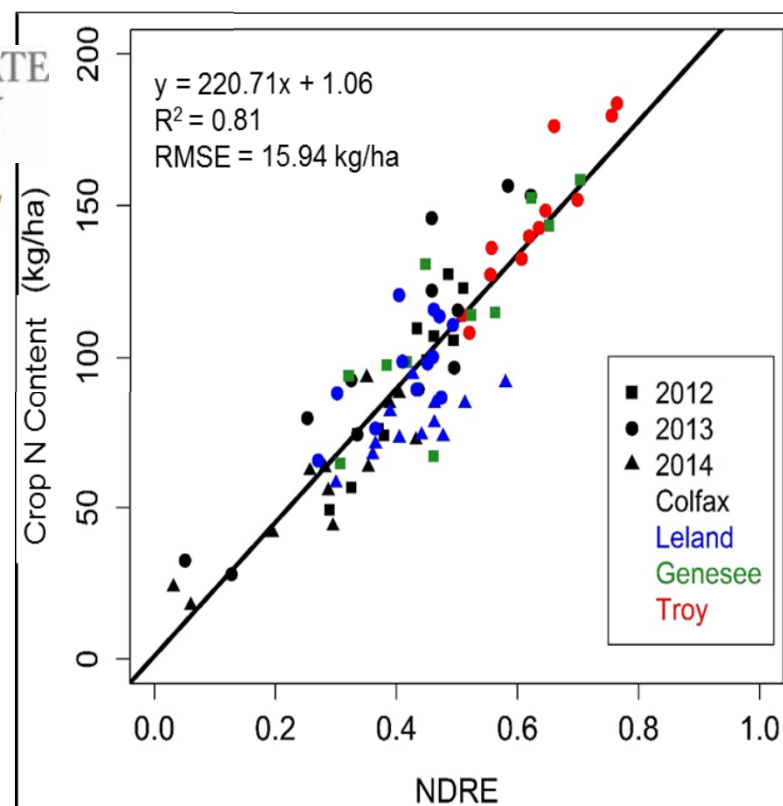
$$\frac{NIR - Red.Edge}{NIR + Red.Edge}$$

Troy Magney



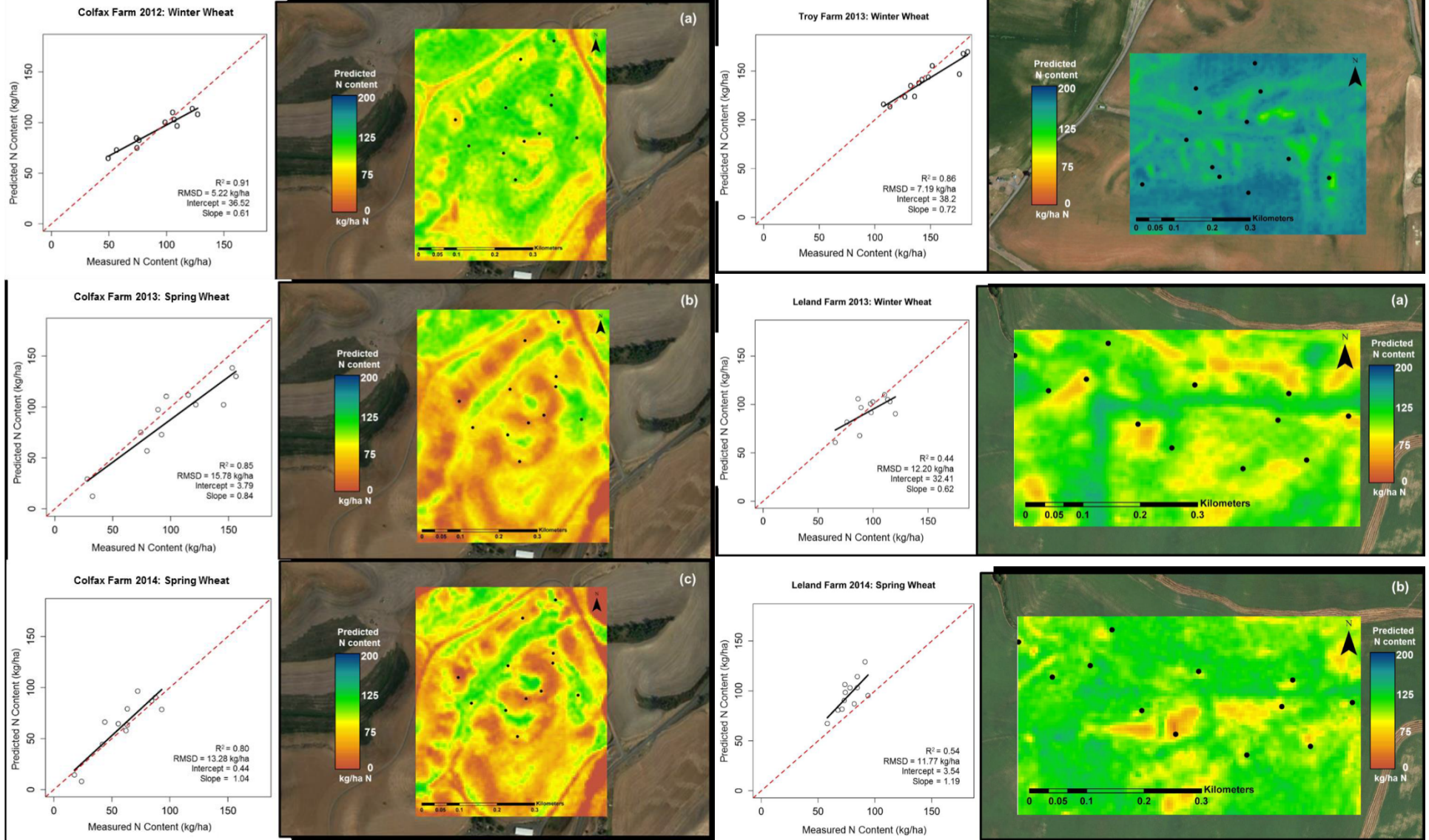
Mapping wheat canopy nitrogen content from RapidEye vegetation indices for post-harvest performance evaluation

Troy S. Magney<sup>1,2\*</sup>, Jan U.H. Eitel<sup>2,3</sup>, and Lee A. Vierling<sup>2,3</sup> In review



- Four fields, 3 seasons, 12 calibration locations/field
- Above ground crop N at harvest correlated with NDRE at peak greenness.
- Patterns vary by year and crop.
- Highest production and N uptake in deeper soils, usually draws and flat upslope areas.

- NDRE responds to both leaf area and nitrogen concentration in leaves (correlated with grain nitrogen).
- Some fields less variable than others (uniformly deep soils).



- Soil water is primary control on spatial variability of yield.
- Effective soil thickness – depth to restrictive layer – controls hydrology.
- Proximal soil sensing used to map restrictive layers (high clay and/or bulk density).

### Electrical Conductivity

Responds to soil:

- Salinity
- Water content
- Clay content

### VisNIR penetrometer

Estimates:

- Clay content
- Bulk Density
- Organic Matter

