

Remote sensing for management zone delineation

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Is there a role for remote sensing? What can remote sensing detect?



Image date: August 2, 2006

Types of remote sensing



Remote sensing platforms

Satellite



Passive optical remote sensing



- Hyperspectral
 - many contiguous bands
- Multispectral
 - fewer broad bands



Soil spectral reflectance

- Texture (% sand, silt and clay)
- Moisture content (dry, moist, saturated)
- Organic matter content
- Iron oxide content
- Salinity
- Surface roughness
- Crop residue





Red reflectance = R, Green reflectance = G, Blue reflectance = B





Vegetation spectral reflectance



• Vegetation indices exploit differences in reflectance in key regions of the spectrum

Vegetation spectral reflectance



- Crop growth
 - Leaf area index
 - Biomass
 - Yield
- Crop stress
 - Nutrient deficiency
 - Insect damage
 - Weeds
 - Moisture

• Vegetation indices exploit differences in reflectance in key regions of the spectrum







- Retrieval of biophysical crop and field descriptors in order to develop procedures for delineating homogeneous field sub units for crop management using CV-580 Polarimetric data and CASI hyperspectral reflectance
 - Location: Greenbelt Farm in Ottawa
 - Two fields (wheat and corn)
 - 3 campaigns
 - Optical and radar airborne remote sensing data
 - Extensive ground sampling



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- 2. Based on ground sampling developed a relationship to estimate leaf area index.



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- 1. Transformed Chlorophyll Absorption Ratio Index (TCARI)
- 2. Optimized Soil Adjusted Vegetation Index (OSAVI)
- 3. Based on ground sampling developed a relationship to estimate plant chlorophyll content



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Integration of remote sensing into crop management



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Integration of emote sensing into crop management

- Is there a place for remote sensing?
- Images are a snapshot in time, need to integrate information (derived management zones) from different times of year (soil versus vegetation) and from different years.
- Integrate other data layers.





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