Monitoring the N release from organic amendments using proximal sensing

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Department of Agriculture

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Optimal
Organic amendments (OAs)
management

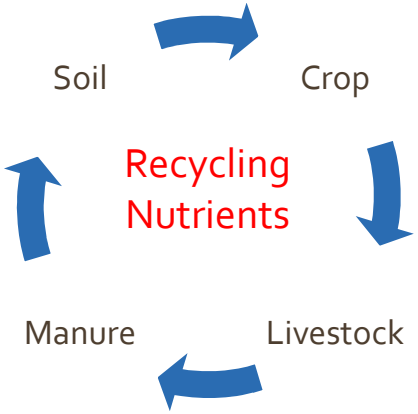
→ Provide sufficient N to maximize yield

→ Minimising N losses

→ N release = high grade temporal variability

→ The In season assessment crop N status

→ PROXIMAL SENSING



AIM

- Compare the three main Vis currently in use (NDVI, NDRE and CCCI) to monitor the N content of a vegetable crop to asses the efficiency of an optimized organic amendments application strategy

Methodology

SITE

Gatton- South-East Queensland
(Vertosol)

TREATMENTS

Two seasons of Lettuce (*Lactuca sativa*) 2014-2015

First season:
Raw feedlot manure (Ma) @ 100% and reduced (100% - $N_{(min\ org\ amend)}$ +Opt) mineral N-fertilizer based on standard farm practices (CONV).
Second season:
Only Ma and Ma+Opt

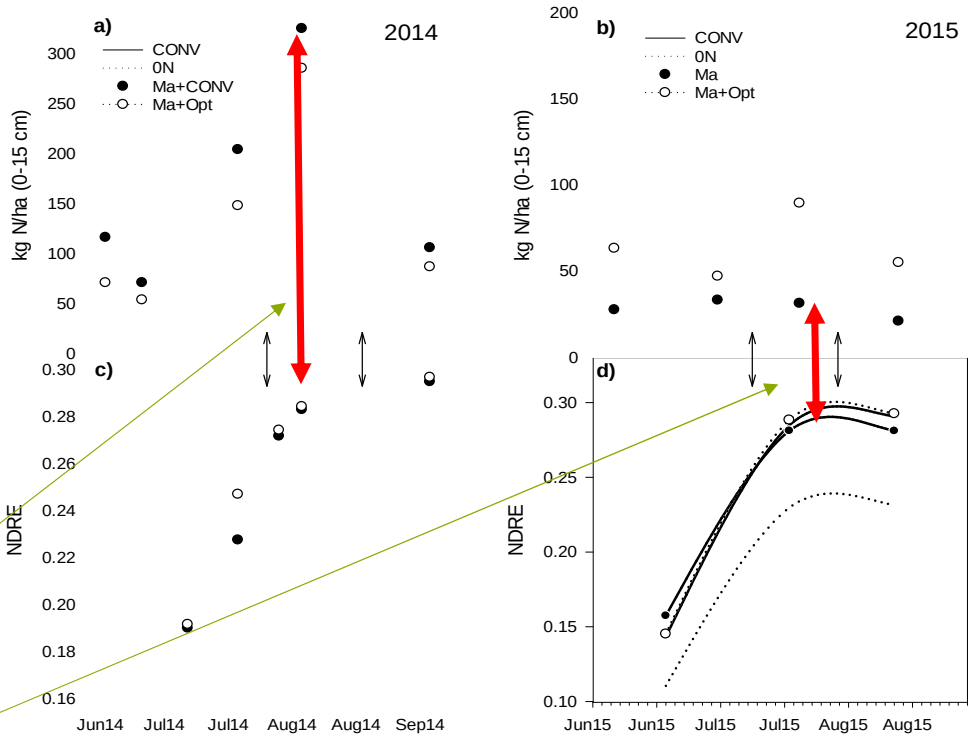
MONITORING

1. Soil plant available N
2. Plant reflectance at RED, RE and NIR (670, 730, and 780 nm)
RapidSCAN CS-45

Results and conclusions

Vegetation index and reflectance vs. crop N content				
	NDVI	NDRE	CCCI	RE
R^2	0.60	0.67	0.61	0.23
significance	***	***	***	***
RMSE	0.67	0.61	0.66	0.93
Model	Linear	Linear	Linear	Linear

***
P<0.001



- ❖ The NDRE best index
- ❖ The temporal trend of NDRE allowed to :

- early detect the surplus of soil plant available N in the +CONV treatment in the 2014 season
- crop N deficiency in the Ma treatment during the 2015 season

NDRE during the mid/late stage of Lettuce development, with the inclusions of non-limiting N plot, has the capability to assess whether the crop is receiving sufficient N under an optimized organic amendments strategy