Optimising salad and vegetable crop production using remote sensing

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Introduction

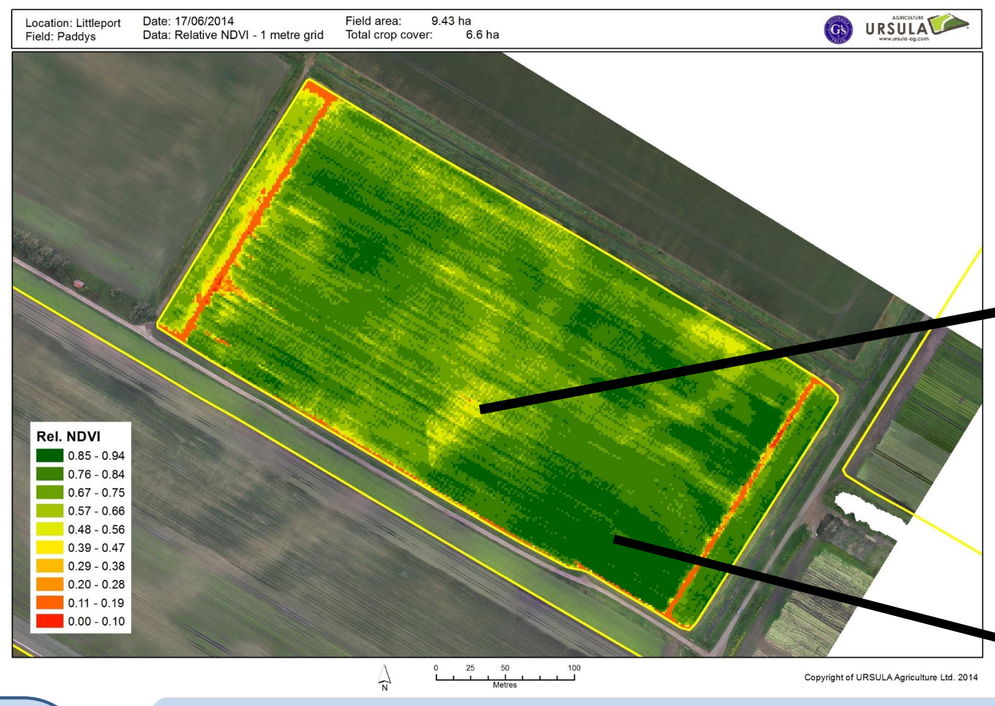
- UAVs or 'drones' are increasingly being used in agriculture.
- Their imagery has superior resolution and can be produced on demand.
- Products such as plant health and vigour maps can be produced but the results need calibrating with a ground survey.

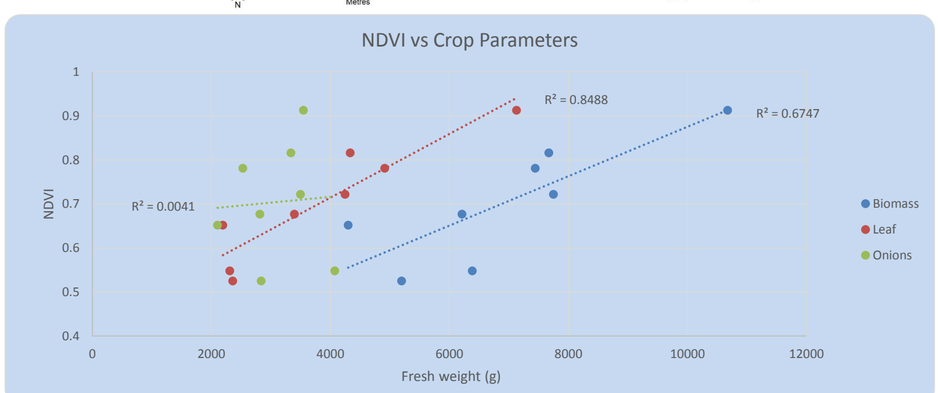
Objectives

- Investigate whether variability shown in remote sensing products correlates to biophysical parameters of crop.
- Investigate whether yield can be predicted from early season remote sensing.
- To evaluate the commercial benefits of UAVs in agriculture.

Method

- Map NDVI – A commercial drone operator collected imagery using fixed and rotary wing UAVs.
- Stratify NDVI – The values were stratified into eight bands and sample points located in each band.
- Sample crop - Just before harvest the onions in each sample location were removed and weighed.





Results

- NDVI map shows good correlation with biomass. Good for calculating pesticide or fungicide application rates.
- Poor correlation with marketable yield. Other factors such as quality also affect amount sent to market.

Conclusions

- Remote sensing from UAVs can replace other methods and field walking for crop monitoring.
- UAVs provide a very rapid method of data collection, though the processing chain needs further improvements to reduce the time between image capture and map production.
- Future improvements and a reduction in price should make the use of UAVs for crop assessments a standard farming practice. They can already spray individual weeds with herbicide, reducing fuel costs and pollution.

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