

Precision Agriculture Project

Stephen Creese, "Rannoch Park", Longford

Site details

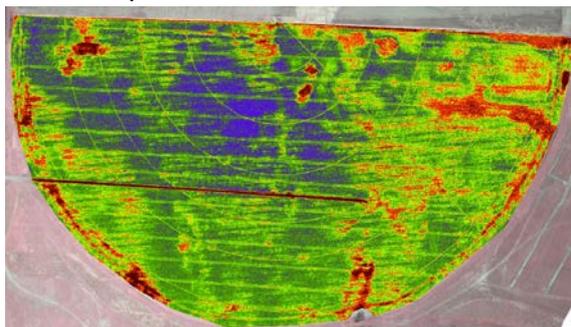
- chromosol (duplex) and tenosol (sandy loam/sandy clay loam over clayey sand, loamy sand over sand, and sandy loam/clayey sand over coarse gravelly sand)
- 38 ha paddock, divided based on annual cropping needs, centre pivot irrigator
- 2015-16 crop – onions
- 2016-17 crop – broccoli, peas. Only the peas were sample harvested
- representative of northern midlands cropping enterprises
- two soils with different management requirements

Representative data layers

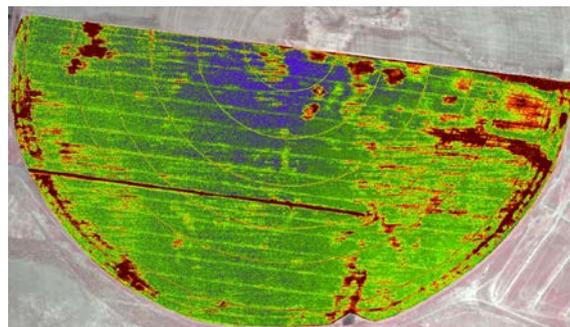
EM38 and other layers have been collected previously. Examples are shown on the next page.

In-season NDVI images

NDVI images were captured by Terrapix two times during the growing season, as seen below. The satellite service (i-EKbase) that was proposed to be used proved to be too unreliable with cloud cover. Areas with poor drainage and low yield are evident on the east side of the pivot.



NDVI – 11 Dec 2016



NDVI – 22 Dec 2016

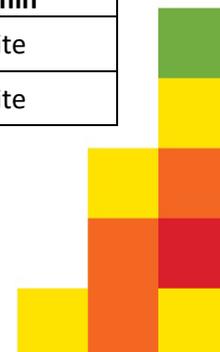
Yield variability

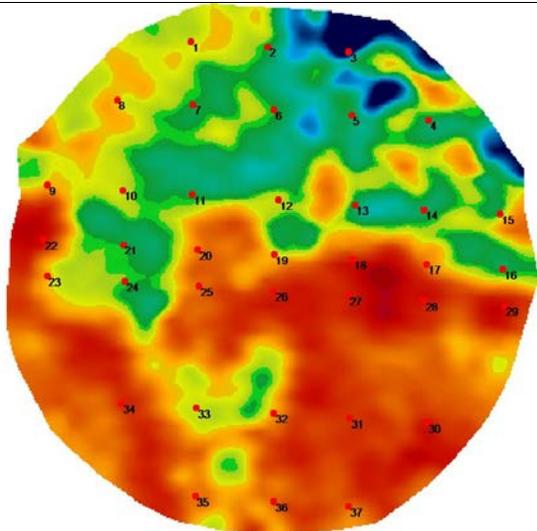
Yield samples were taken from 22 points in a grid pattern across the paddock – see images on next page. This represents an average of 1 sample per 0.9 ha. At each sample location, the peas were harvested from 2 m² of crop. Samples were processed to determine yield and MI. Variation in yield and MI is shown in the table below.

Site	Crop	Measure	Units	Average	Min	Max	Variation ratio max:min
Rannoch Park, Longford	Peas	Yield	t/ha	9.8	0	18.1	infinite
		MI		170	0	263	infinite

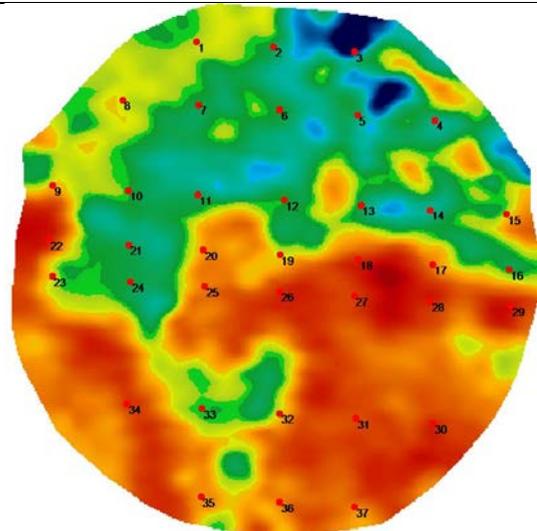


Tasmanian Agriculture
Productivity Group

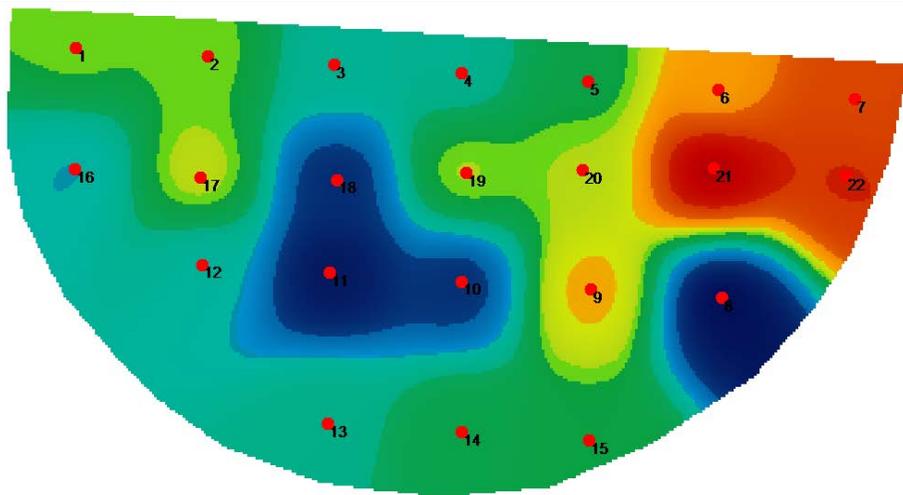




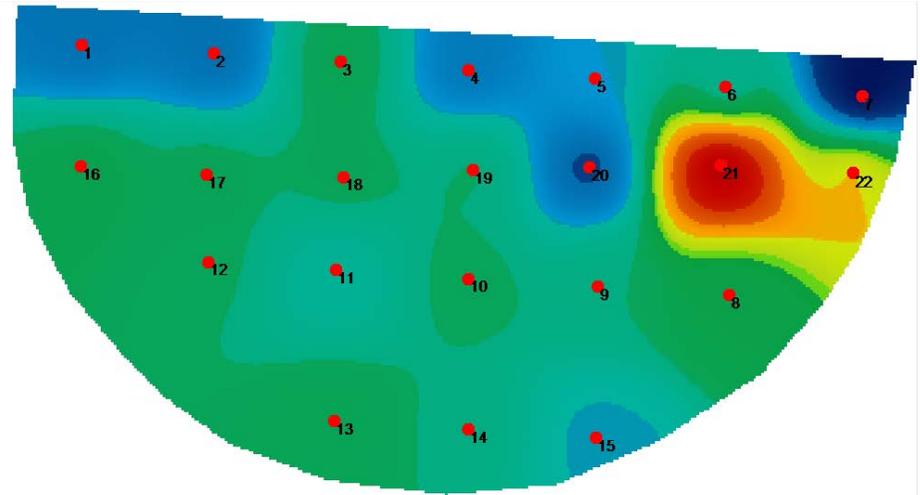
EM38 shallow



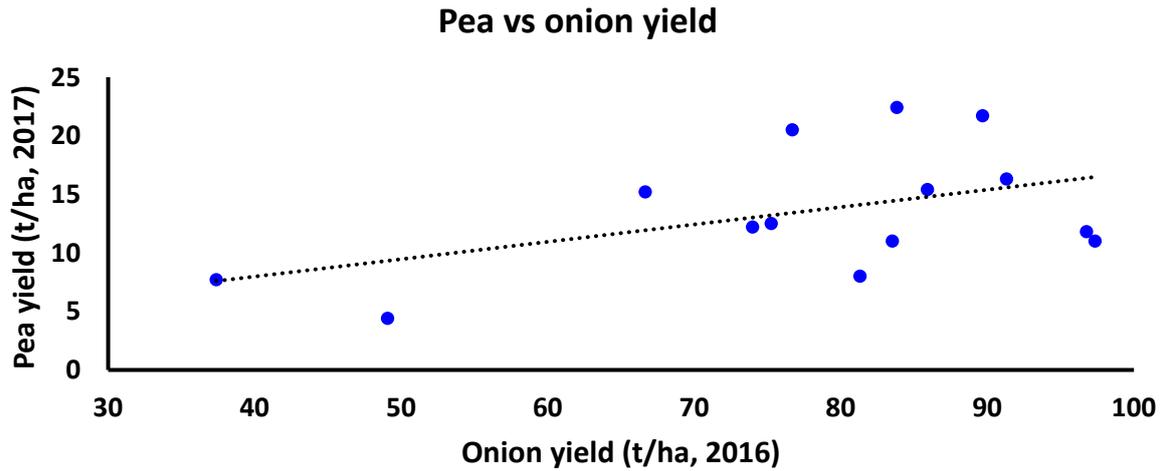
EM38 deep



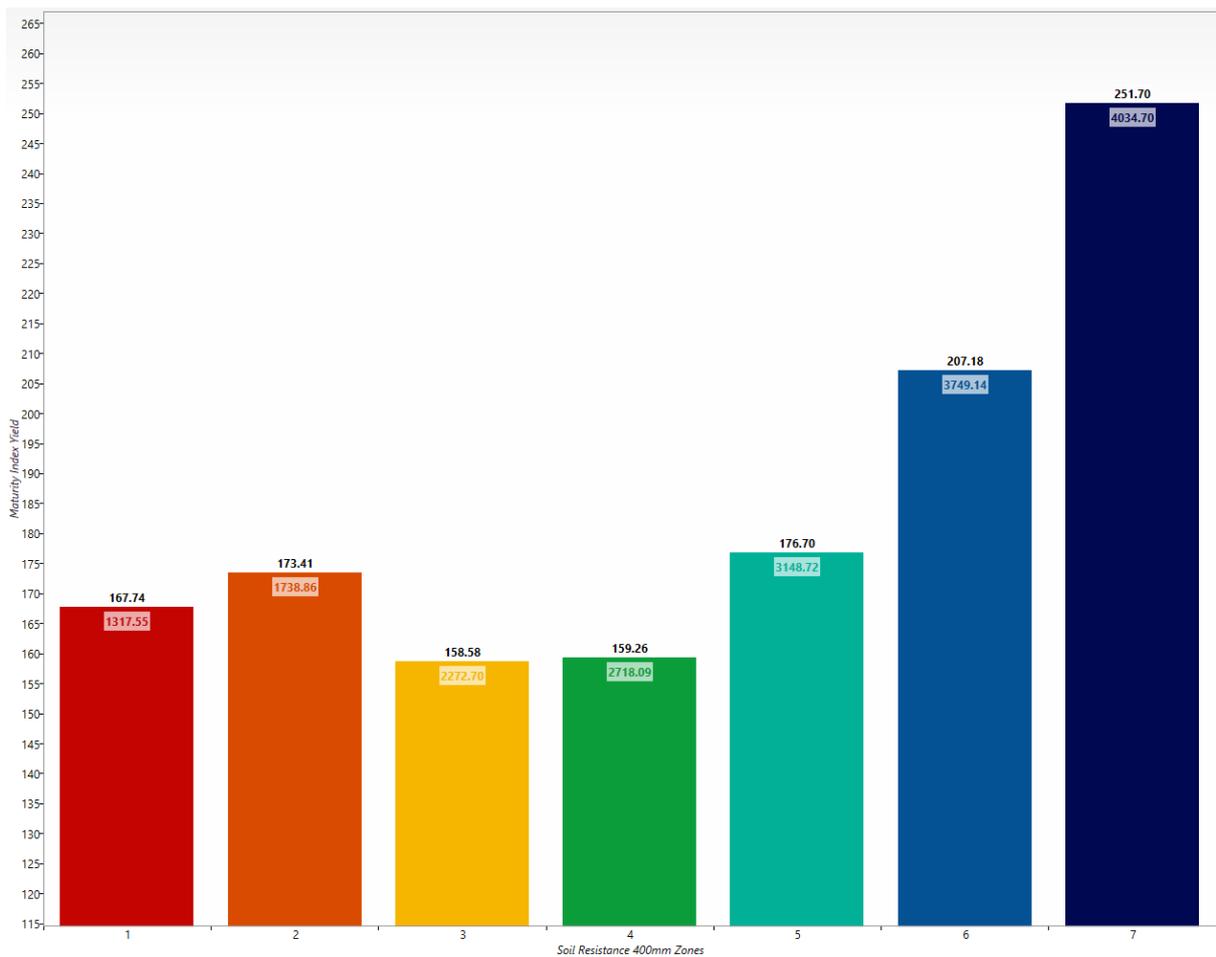
Yield - peas (2017)



MI - peas (2017)



The graph above shows the relationship between the yield of onions in 2016 and peas in 2017. There is a slight trend to indicate that low yielding areas yielded low in both crops, and there is a bit of a cluster of high yielding areas, but there is not a strong relationship to say the high yielding areas will always yield high.



The graph above, comparing Pea MI to soil resistance, suggests that there is a tendency for MI to be higher when soil resistance is higher. This is perhaps not surprising, as areas where pea plants are under stress tend to mature earlier.

Comments

This paddock has areas of low EC aligning with free draining sandy soils. There are stripes of low vigour in the NDVI images that look like an impact of wheel tracks. It is possibly a compaction impact from tillage or seeding operations. We would have required more accurate and geo-referenced NDVI images to be able to do targeted sampling to determine the cause. The next crop planned for this paddock is potatoes.

Considerations from the next season

- A drainage plan is being prepared for this paddock with the aim of dealing with the low lying areas in the north and east of the pivot.