Successful Summer Cropping

Matt Nihill, Agronomist, Landmark Elmore

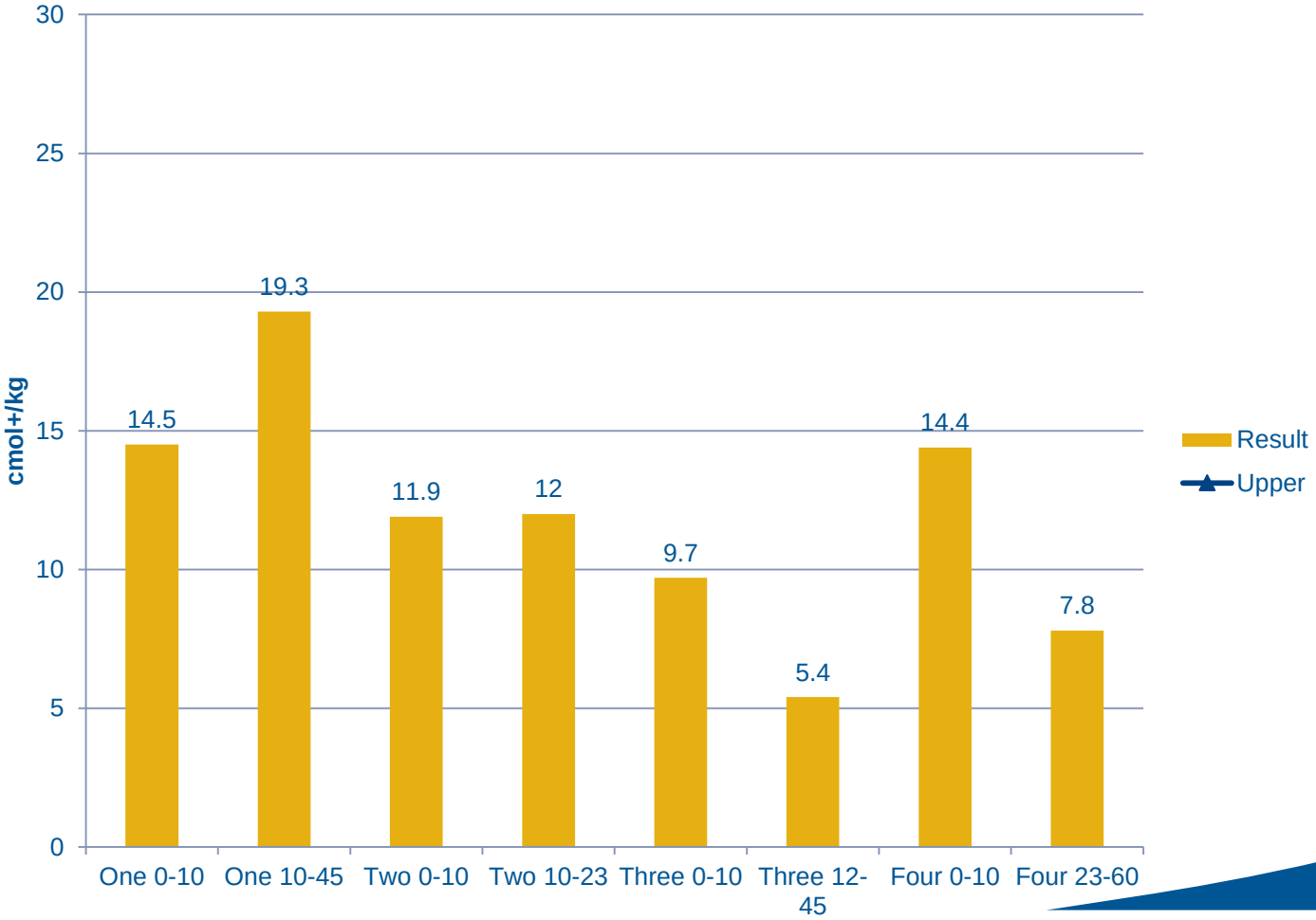

Discussion about maize soil
pit tour (workshop 2)

Double cropping system

- Pushing the system
  - Return per hectare and per ML
  - Time
  - Nutrition
  - Seasons
  - Weed Burden
  - Soil type – Mostly structure
- Soil pits

Soil Pits

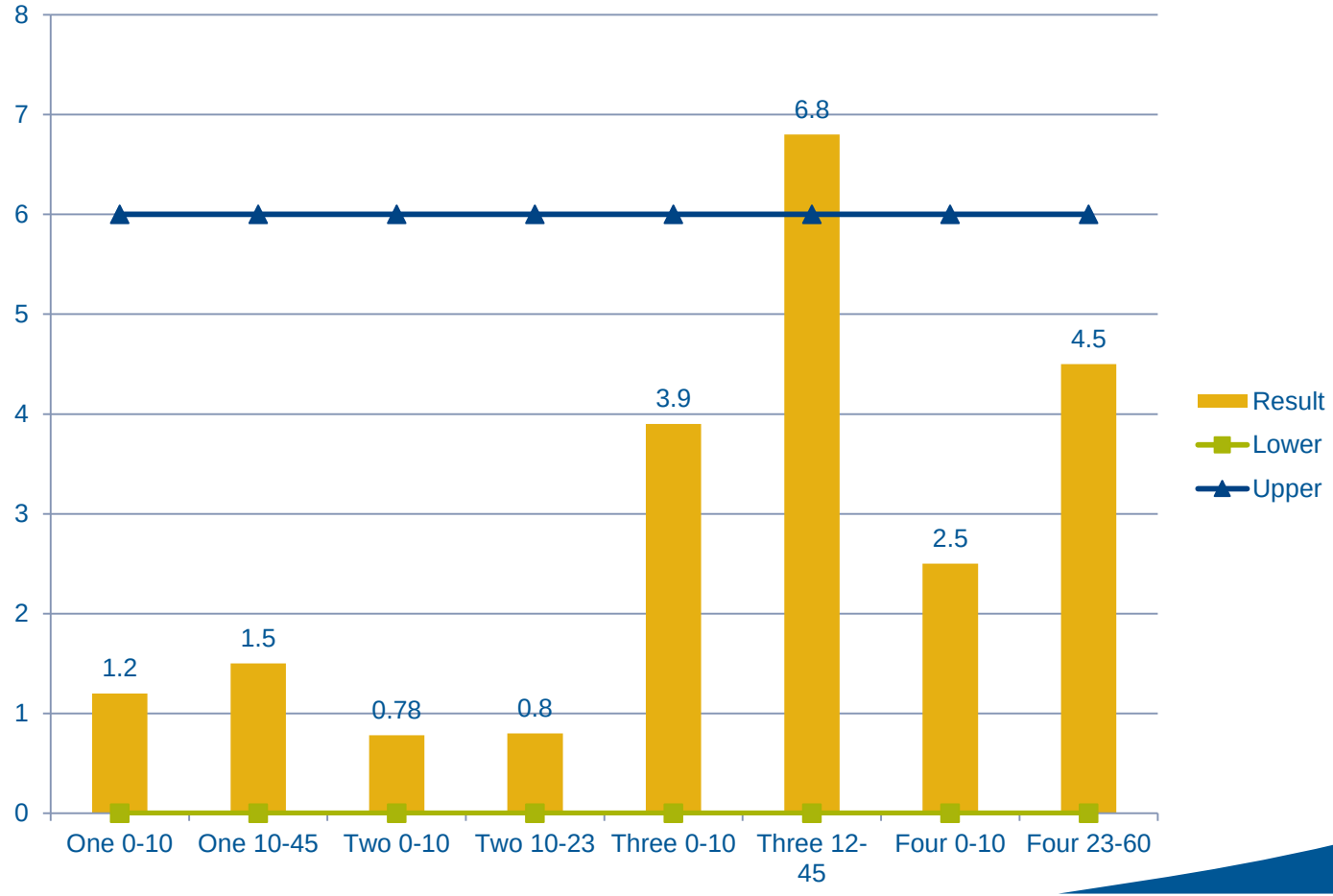
Effective Cation Exchange Capacity (cmol+/kg)



Murray DAIRY | Dairy Australia

Your Levy at Work

Sodium % cations



Murray DAIRY | Dairy Australia

Your Levy at Work

Sites One and Two

- Shallow topsoil
  - Sandy clay loam over heavy clay

- Deeper topsoil
  - Coarse sandy clay loam to depth


Help the roots get deeper

Soil constraints – Rotations

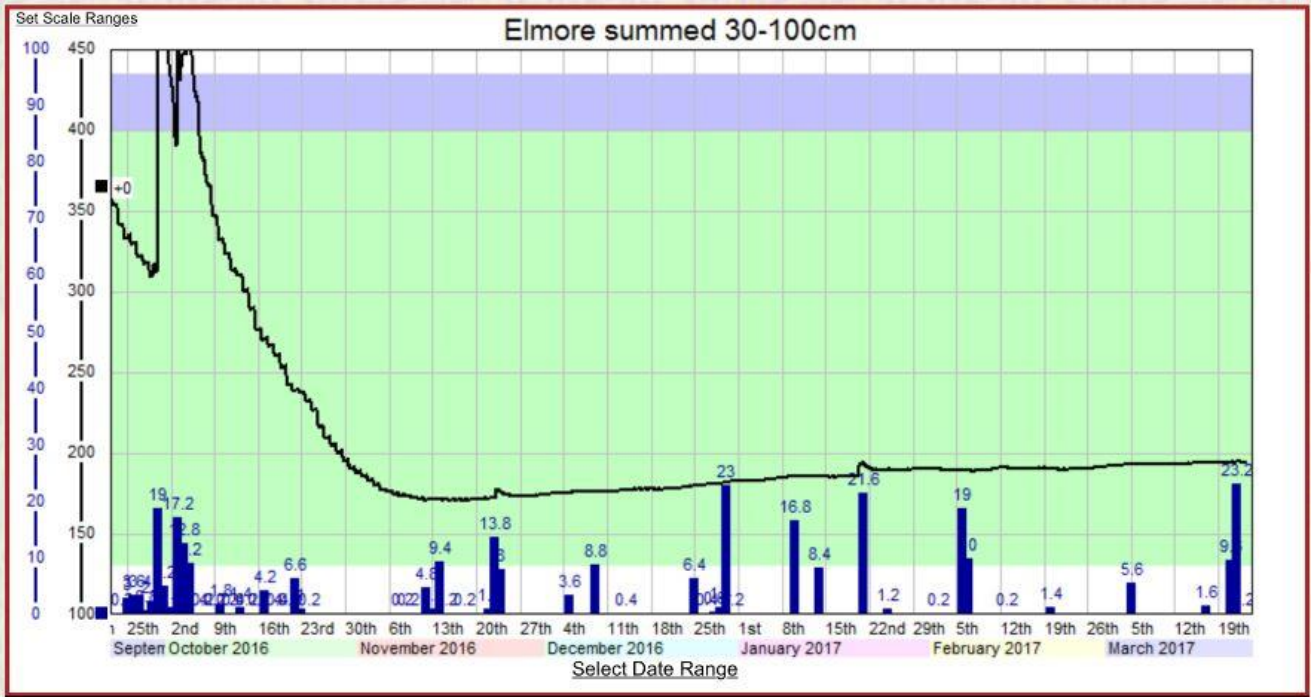
Bring back wetting drying cycle

How rotations might help

- Cereal to dry profile out
  - Force roots to proliferate deeper
  - Dry soil out
  - Crack soil
  - OM falls through cracks

Soil constraints – Rotations

Root Depth – cereals will forage deep!



Soil Constraints - Mechanical

Compaction

Strategic ripping??

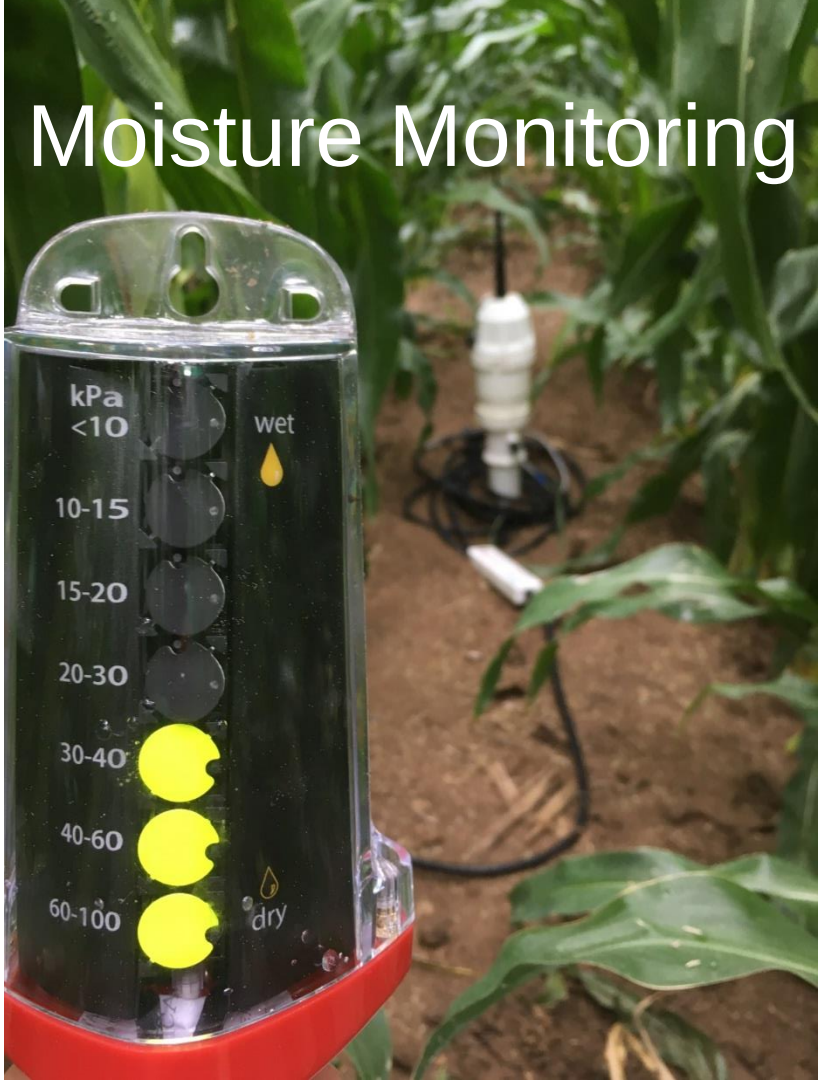
- Not all soils will respond

Subsoil Sodicity –

- Poor internal drainage
- How do we stabilise sodic subsoil?

Subsoil manure?

Moisture Monitoring



Soil Constraints - SMM

When not to water!

- Better than shovel
- Gives better insight as to crop water use.

Soil management Summary

Get roots deeper into the soil

- Dig a hole and assess

Soil moisture probes

End game: Improve WUE

- Stored Soil moisture
- Rainfall
- Irrigation


Agronomy for high yielding cereal fodder crops

Agronomy: what limits Yields?

Yield Potential

- Lack of moisture
- Low fertility
- Poor Soil Structure
- Poor establishment
- Disease and Insects
- Weeds

Aim to control what we can - MANAGEMENT

Topics

Paddock prep and planting for cereals

- Soil Constraints
- Weed management
- Pest Management
- Crop establishment

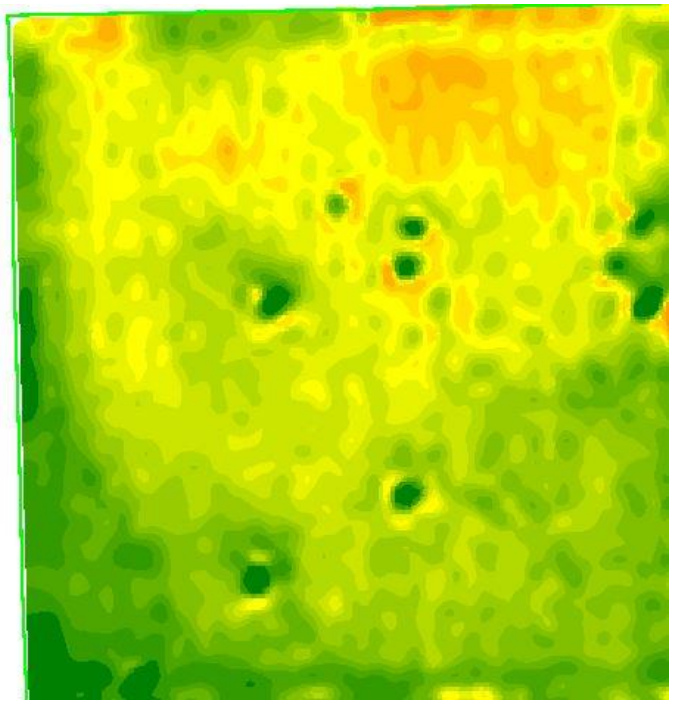
Nutrient considerations from 2016

- Nitrogen - wet conditions

Implications of rotations.

Soil constraints

- Eliminate topsoil issues
- Drainage – a must for high yielding crops
- Where was the crop poor last year in the wet?
- NDVI can show hidden plant stress
- Ground truth
- If not wet, what else is it?



Soil Constraints

Investigate other limitations

- Soil Test
  - pH
  - EC
  - Sodicity
  - Nutrient limitation

Tips for watering up

Seed with good vigour

Sow Shallow

Water on and off quick

Start with dry profile

No rain for at least 7-14 days

Select a site not prone to weeds

Not after 1st April

Courtesy Damian Jones, ICC

Crop Establishment

- Don’t limit yield before the crop comes up
  - Sown too deep
  - No pre-em/ pre em damage
  - Seedbed difficulties
  - Sown too late
  - Seeding rate not right

Seeding

Target plants per square metre

- Aim to establish 160-170 plants per square metre
- Aim for 675 heads per square metre*.
  - Note varietal and sowing time variability, this is a guide
- Sowing rate = desired plants per m2 x seed weight/ % crop establishment (field loss)
- Then divide by seed germination

*Data courtesy of Damian Jones, ICC

Seed test results - wheat

Murray DAIRY | Dairy Australia

Your Levy at Work

RESULTS:

GERMINATION (%)		
Healthy seedlings	**Deformed/delayed seedlings**	**Ungerminated seeds**
96	0	4
Test method: 20oC day/ 15oC, 12 hr photoperiod. Assessment at 5 days. (Please note that the germination result does not indicate the vigour of the seed but germination under ideal conditions.)		

VIGOUR (%)		
Healthy seedlings	**Deformed/delayed seedlings**	**Ungerminated seeds**
92	6	2
Test method: Seeds sown at set depth & vernalised 5-8°C followed by 20°C / 15°C normal growth. Assess at 7 days.		

1000 Seed Weight (g)
34.40

Seeding rates

Oats

Target Pop'n	Actual Pop'n	Stems/m^2	Stems/plant	DM t/ha	Stem dia (mm)
120	102	521	5.11	22.26	4.3
160	136	512	3.76	17.83	4.1
200	170	533	3.14	18.13	3.4
240	202	483	2.39	17.48	3.5

Data courtesy of Damian Jones, ICC

Weed Management - Rotational

Understand the enemy! - History

Know the problem weeds from previous years

How Rotations might help

- Broadleaf weeds can be controlled in cereal
- Grass weeds controlled in pulse eg vetch, clover

Weed management - Cultural tips

Murray DAIRY | Dairy Australia
Your Levy at Work

Ground Cover

- Sow when soil is still warm
- Narrower row spacings cover the ground quicker
- Sow East West where possible

Sow cleaner paddocks first

Ensile/hay

Weed Management - Herbicides

Murray DAIRY | Dairy Australia
Your Levy at Work

Knockdowns

- Pre sowing
- Probably need more in tank than just Roundup
  - Knockdown Spikes
- Mix it up, don’t always use Roundup
- Double knock

Weed Management - Herbicides

Pre emergents

- Kill weeds at or shortly after emergence
- Key factors for success
  - Position of weed seed (cultivation)
  - Stubble
  - Moisture availability
  - Crop tolerance
  - Seeding equipment

Weed Management - Herbicides

Murray DAIRY | Dairy Australia
Your Levy at Work

Post emergents

- Grass selectives unreliable in cereals
- BLW selectives - Good options in cereals
- Work best when weeds are small
- Very few options in pulses for BLW’s
- Be careful of Plant backs

End game?

- Good preparation for future Pulse crops

Pest Management - RWA

Murray DAIRY | Dairy Australia
Your Levy at Work

Russian wheat aphid

- Significant new pest in Australia
- Inject salivary toxins during feeding
- Symptoms as early as 7 days
  - White & purple longitudinal streaks
  - Curled leaves
  - Stunted growth
  - Reduced photosynthetic activity

Pest management - RWA

Avoid infestation early after emergence

- Insecticide seed dressings
  - Imidacloparid*, Thiamethoxam**

Chlorpyrifos and Pirimicarb have permits

Beneficials – ladybirds, lacewings and fungi

*Imidacloparid – 9 week grazing WHP, **Thiamethoxam – 8 weeks grazing WHP

Wheat varieties

- Run to head trigger
  - Winter (March – Mid April)
  - Spring (Early/Mid April onwards)

Nutrient

Nutrient removed from wheat silage per DMT at Booting

- Nitrogen – 20-25kg
- Phosphorus – 1.8 – 3kg
- Potassium – 10 – 15kg
- Sulphur – 2 – 3kg

Work off Soil Test and History

Nutrient - Nitrogen

Nitrogen Supply is a consequence of

- Temperature
- Moisture
- Soil aeration
- Soil Organic Carbon

N supply can vary a lot!

- Fertilise

Nitrogen considerations from 2016

Significant N losses where it got quite wet.

Yields were high

- Spring 2016 was a huge year for mineralisation.

High yields, mean high nutrient removal

This year, we need to watch N levels, they may be lacking – low mineral N

Last years pulse may not have fixed much N

N RICH STRIP!

N Rich Strip

- At sowing, do a strip of 50 – 100 units of N

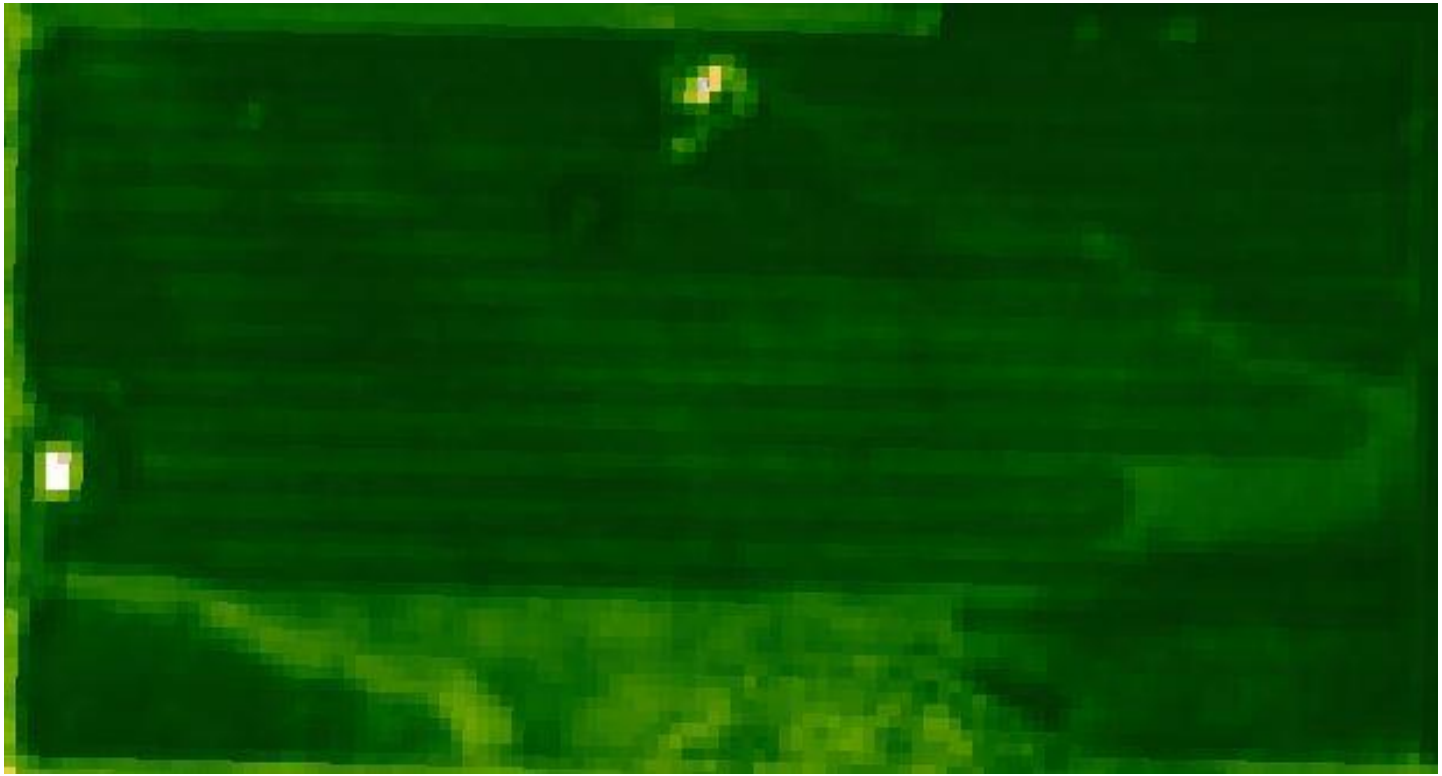
Pulses – N Supply

N fixation related to

- Effective N fixation of the pulse crop
  - Colonisation of rhizobia
    - Soil conditions – pH
    - Moly availability
    - Herbicide residues
- Biomass of pulse crop
  - 16.6kg of N fixed or DMt produced*

*Ballard et al. SARDI 2016

It can be quite wet and a response is still possible from urea!



Summary

High yields are no accident

Timeliness and care has a huge impact on yield

Get the basics right

- Lime and/or gypsum
  - Control of weeds and pests

Use tools available – NDVI then ground truth

- N rich strip

For more information:
www.acceleratingchangeproject.com

Murray DAIRY | Dairy Australia

Your Levy at Work