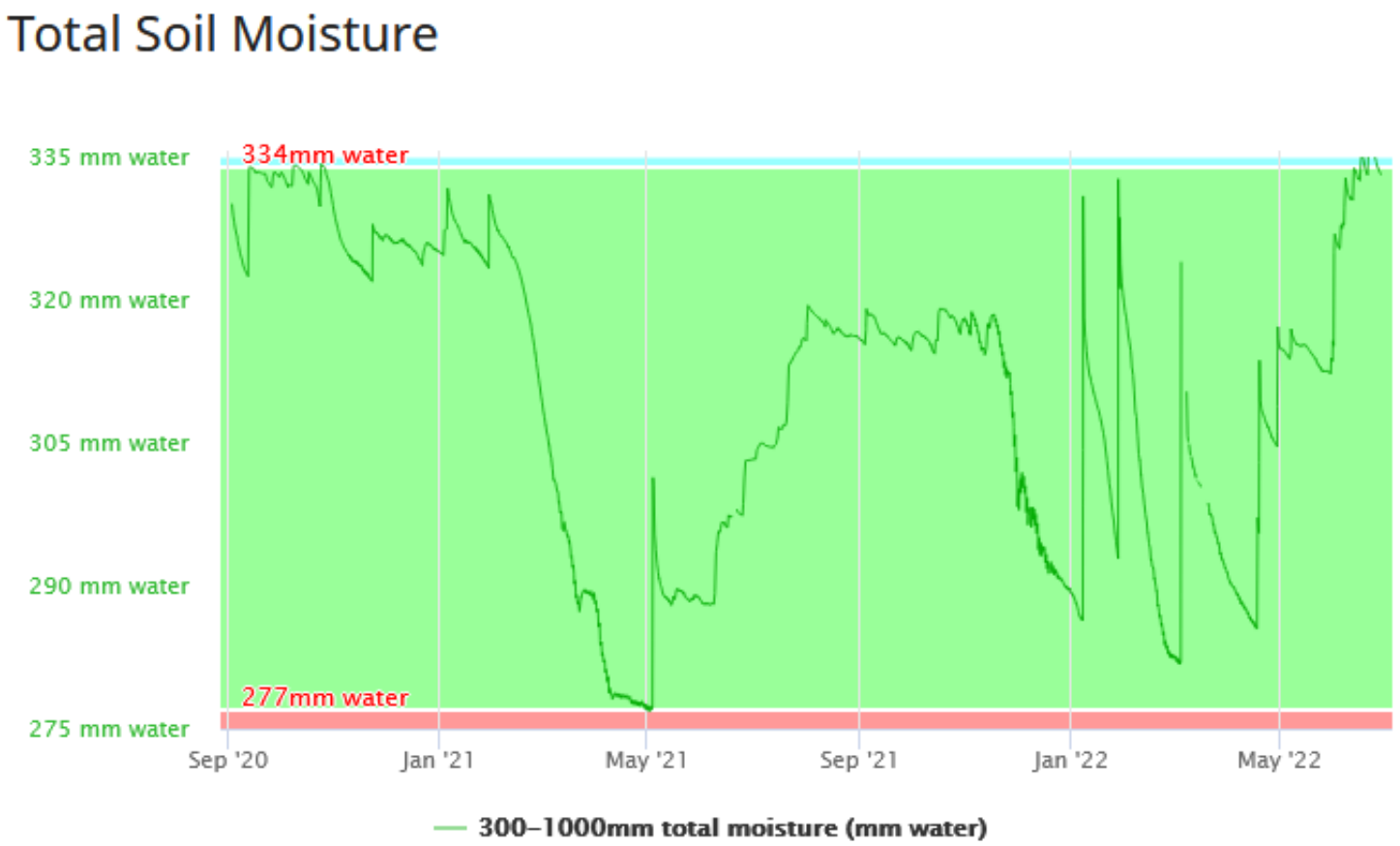
Do I REALLY need a moisture probe?

Cam Nicholson (based on work by James Manson – SFS)



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For pasture (GrassGro)

Possible use: Predicting spring pasture growth

Current soil moisture

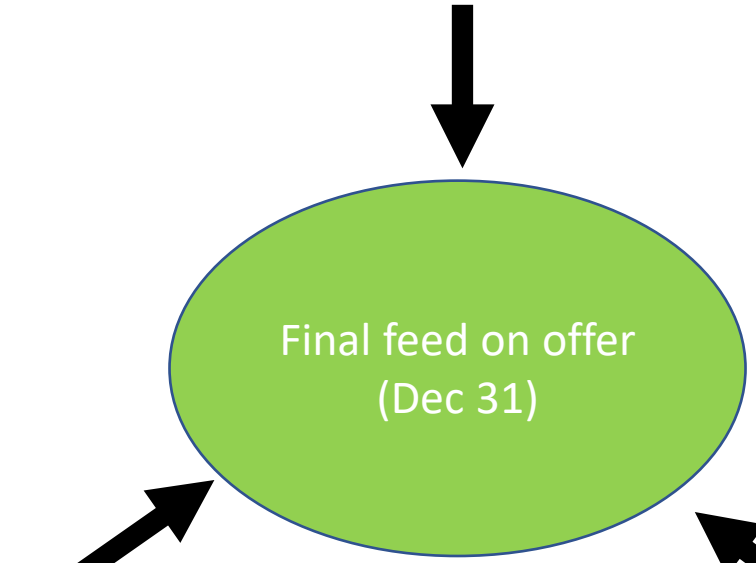
(Decile 1 (40%), 5 (65%), 9 (90%))

Starting dates

Aug 1

Sep 1

Oct 1



Starting feed on offer (FOO)

(Decile 1, 5, 9)

Future rainfall (seasonal conditions)

(dry, average, wet)

Penshurst - Self replacing merino flock, PAWC of 236mm (0 - 1 m), simulation runs 1950 to 2020

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Interpreting the box and whisker graphs

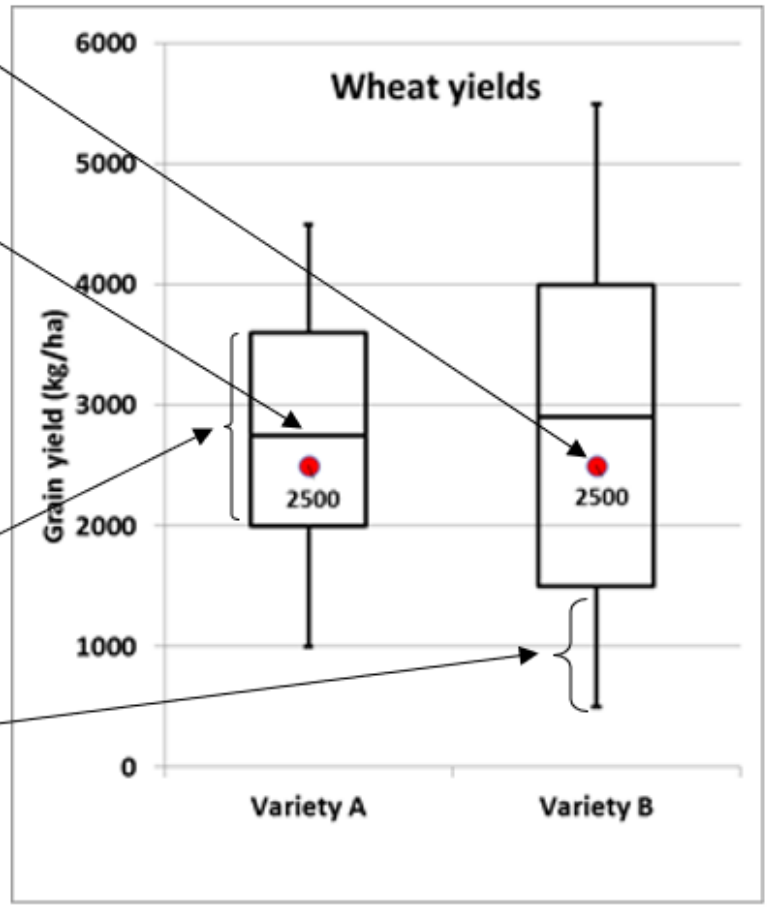
Box and whisker graphs contain four pieces of information.

1. **The average or mean** This is the dot in the box.

2. **The median**. Indicated by the line in the middle of the box and represents where half the numbers fall above or below the average. If the average (mean) and median are not in the same place, then the numbers are not each above and below the mean.

3. **The box.** This represents the range where 50% of the results lie. The 'longer' the box, the more variation (or risk) in the results.

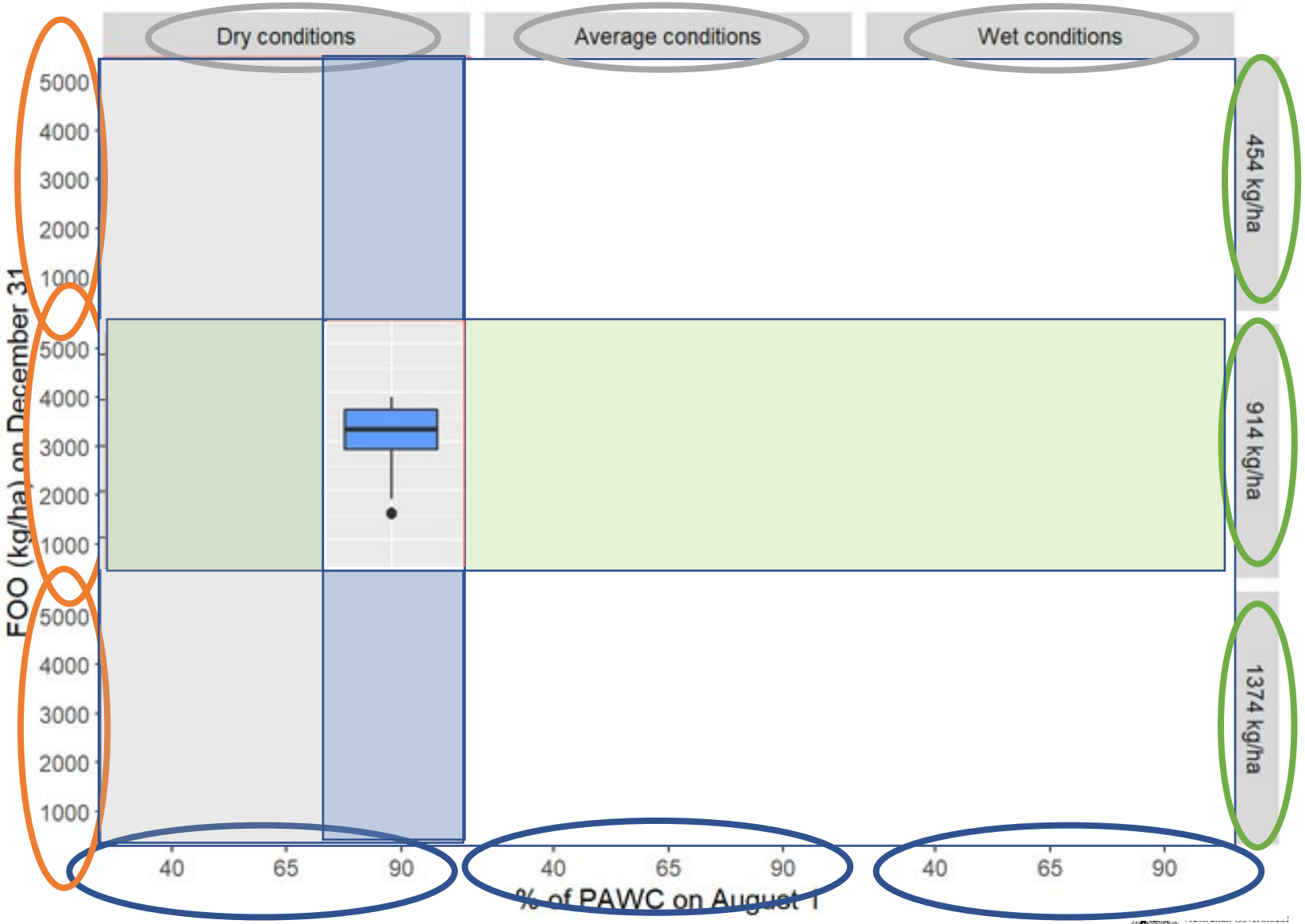
4. **The whiskers**. This represents the range for the lowest and highest 25% of results. The tips of the whiskers represent the most extreme results.



Variety A and B have the same average yields (2,500 kg/ha). The median is above the average for both, indicating a skewed set of results. However the length of the box is greater with variety B, indicating more range in the results.

Making a prediction on August 1 about December 31

Future rainfall (seasonal conditions)



Starting feed on offer (FOO)

Current soil moisture

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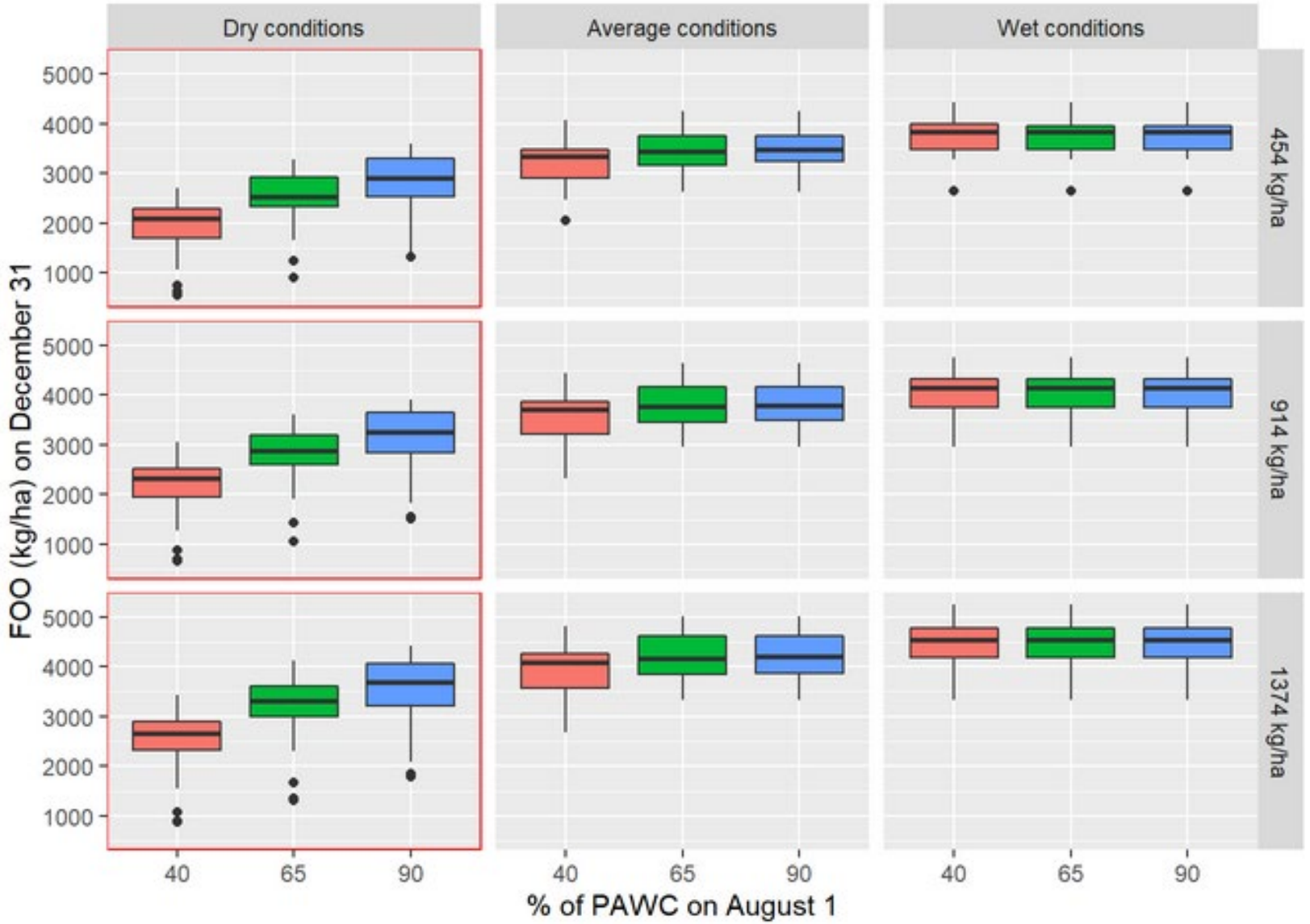
Making a prediction on August 1 about December 31



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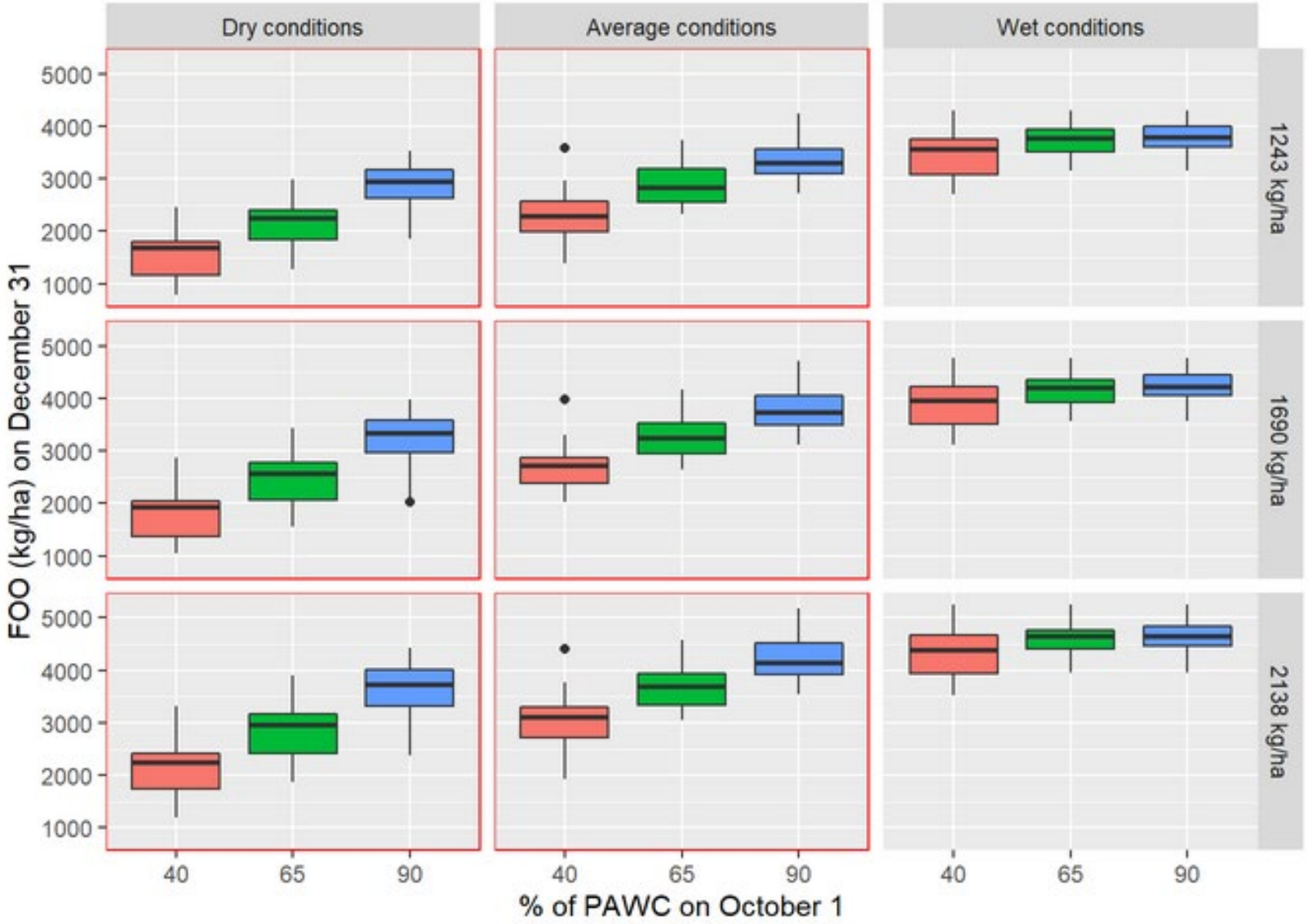
Making a prediction on October 1 about December 31



In summary (an economic analogy)

- Rain drives the economy
- Initial FOO is the capital (the more the better)
- Initial PAW is the insurance (protects against the bad springs)

So, on **August 1** what December feed should we expect at Penshurst?

• if there is a dry forecast, look at your PAW
• if there is an average or wet forecast, look at your FOO

So, on **October 1** what December feed should we expect at Penshurst?

• if there is a dry or average forecast, look at your PAW
• if there is wet forecast, look at your FOO

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For crop (Apsim)

Possible use: Predicting water limited yield potential

1. Soil moisture

(0, 20, 40, 60, 80, 100%)

3. Plant available water capacities

140 mm

180 mm

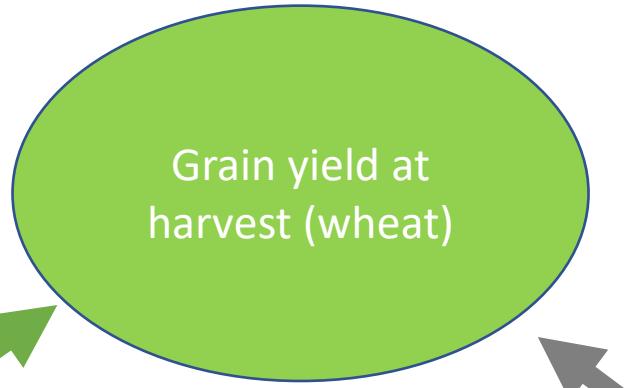
220 mm

5. Prediction dates

Aug 1

Sep 1

Oct 1



4. Crop biomass

(Ideal and delay sowing time)

2. Future rainfall (Sep – Nov deciles)

Simulation years - 1950 to 2020, Hamilton

No nitrogen, frost or heat stress

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Key messages (single factor)

- **Soil moisture (1)** and **spring rainfall (2)** are primary factors influencing potential yield.
  - more **soil moisture**, increase yield
  - more **rainfall**, increase yield
  - interaction (compensation) between **soil moisture** and **rainfall**

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Key messages (single factor)

- **Bucket size (3), crop biomass (4)** and the **date of prediction (5)** are secondary factors influencing predicted yield

  - A larger **bucket size** increases yields (as Hamilton typically 80+% full up to early Sept). Difference between PAWC of 220 mm to 140 mm ~1 t/ha.

  - Higher **crop biomass** increases predicted yield (no negative effects of high biomass)

  - Earlier **date of prediction** results in greater variability in final yield

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Key messages

- Secondary factors are required for **meaningful predictions** from primary factors (but they don’t explain everything)

- When rainfall occurs **within the month** is important – leading to variability in yield predictions

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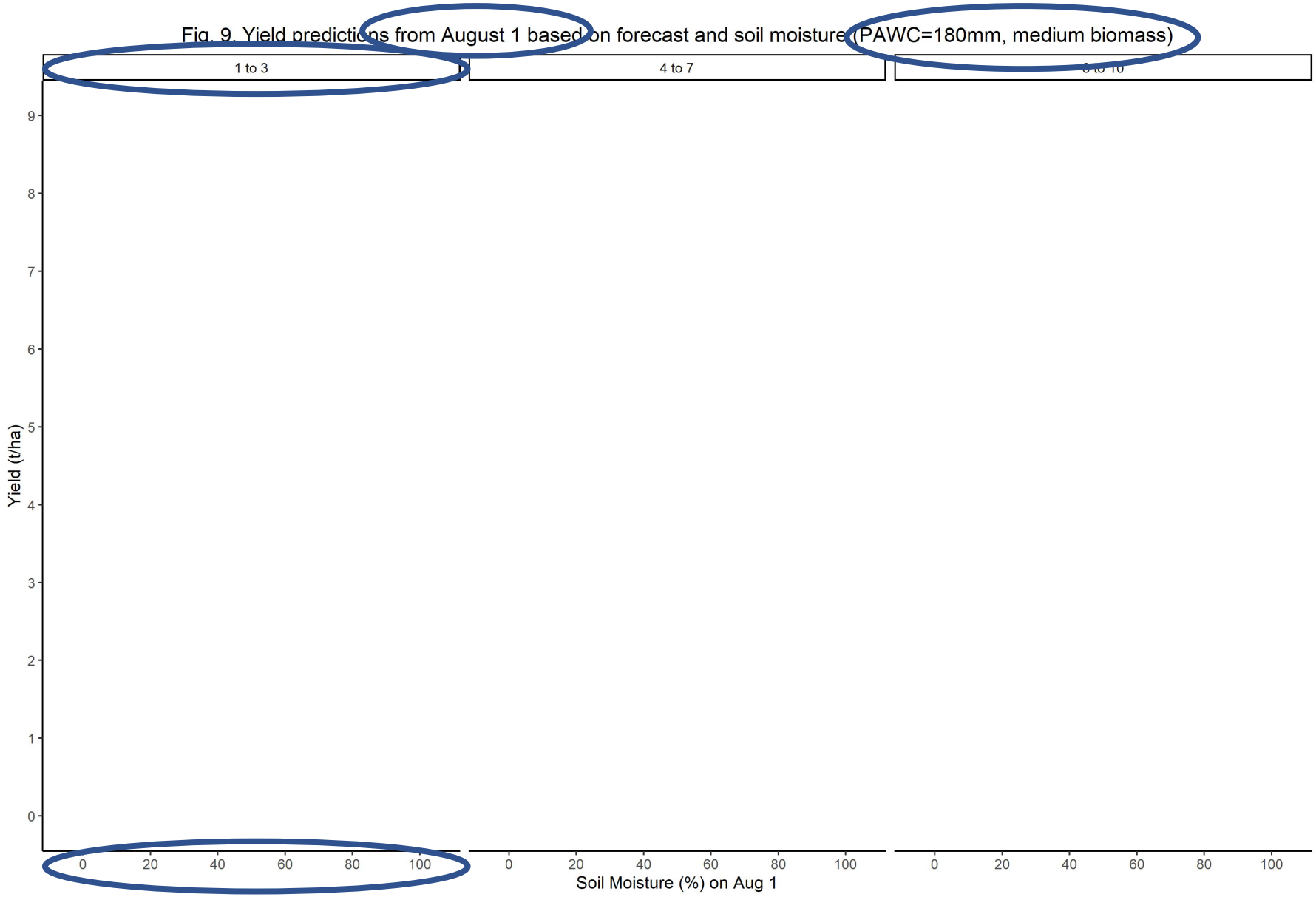
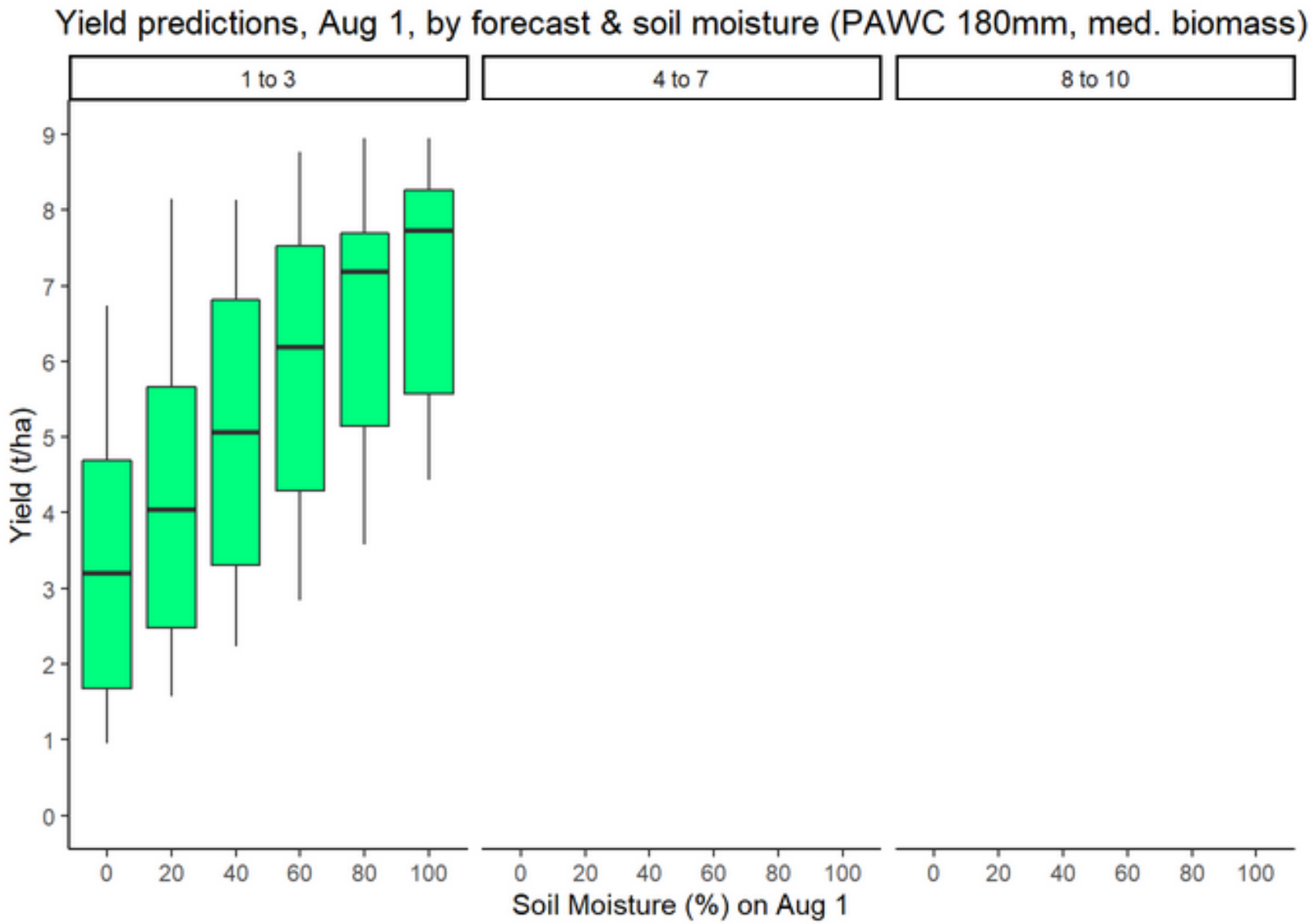
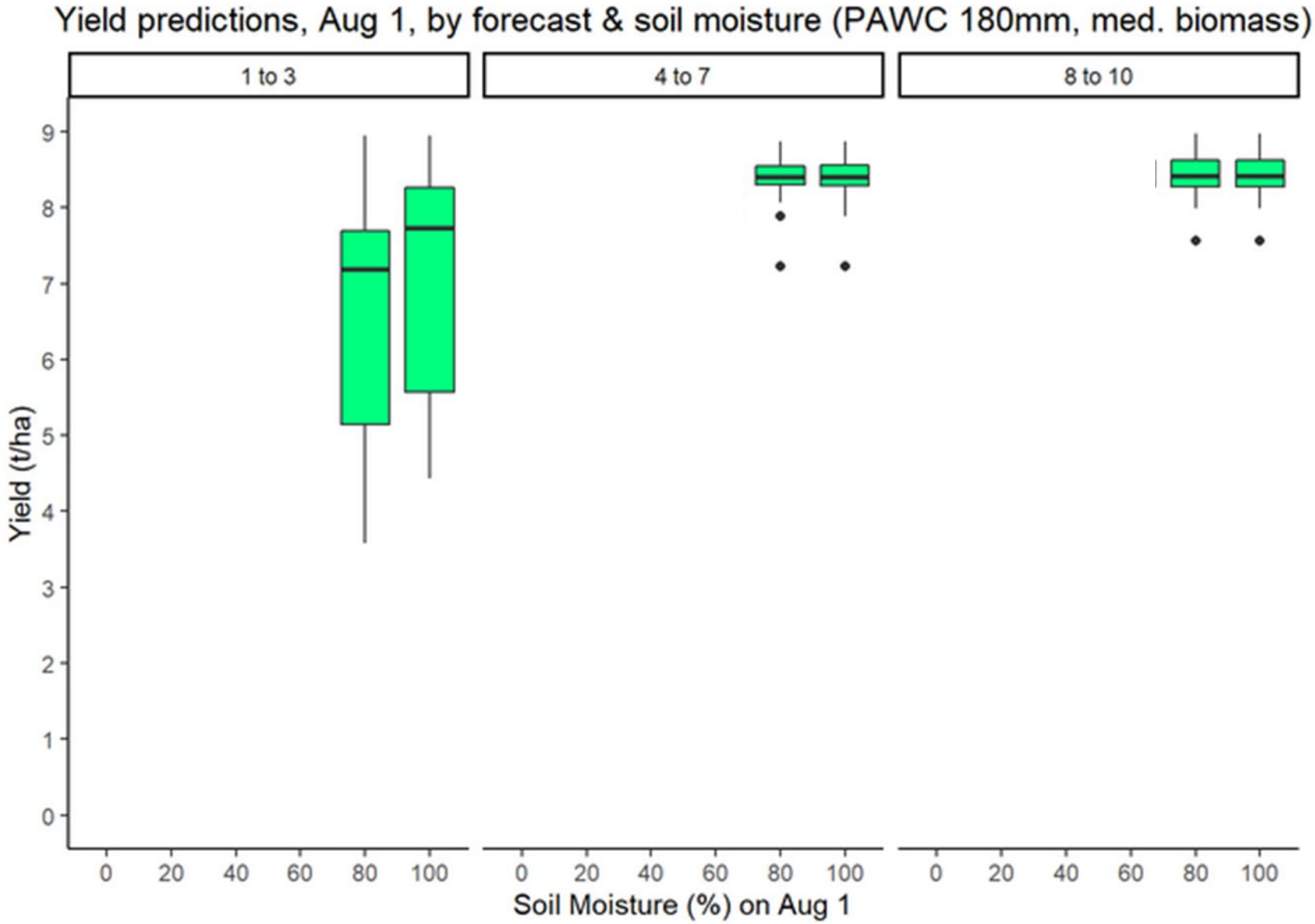
Making a call about predicted yield



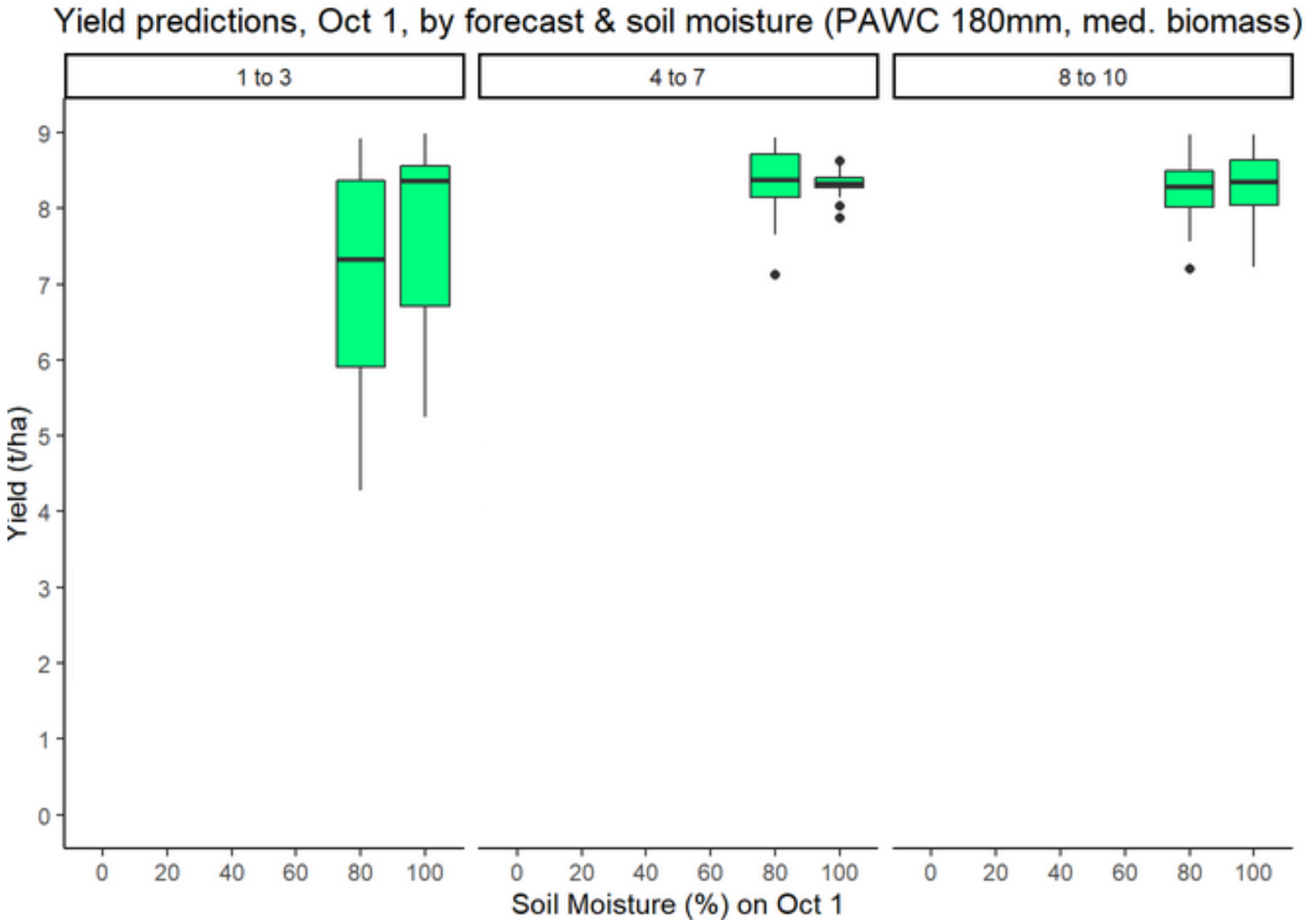
Making a call about predicted yield



Making a call about predicted yield



Making a call about predicted yield



Implications for crop decision-making

- It is possible to achieve high yields with one of low soil moisture or low spring rainfall, but not both.
- If the forecast for spring is **drier than average**, pay attention to the soil moisture probe from August. Otherwise, don't worry about moisture supply until September
- Soil moisture probes are not as essential to decision making in the HRZ as lower rainfall environments.

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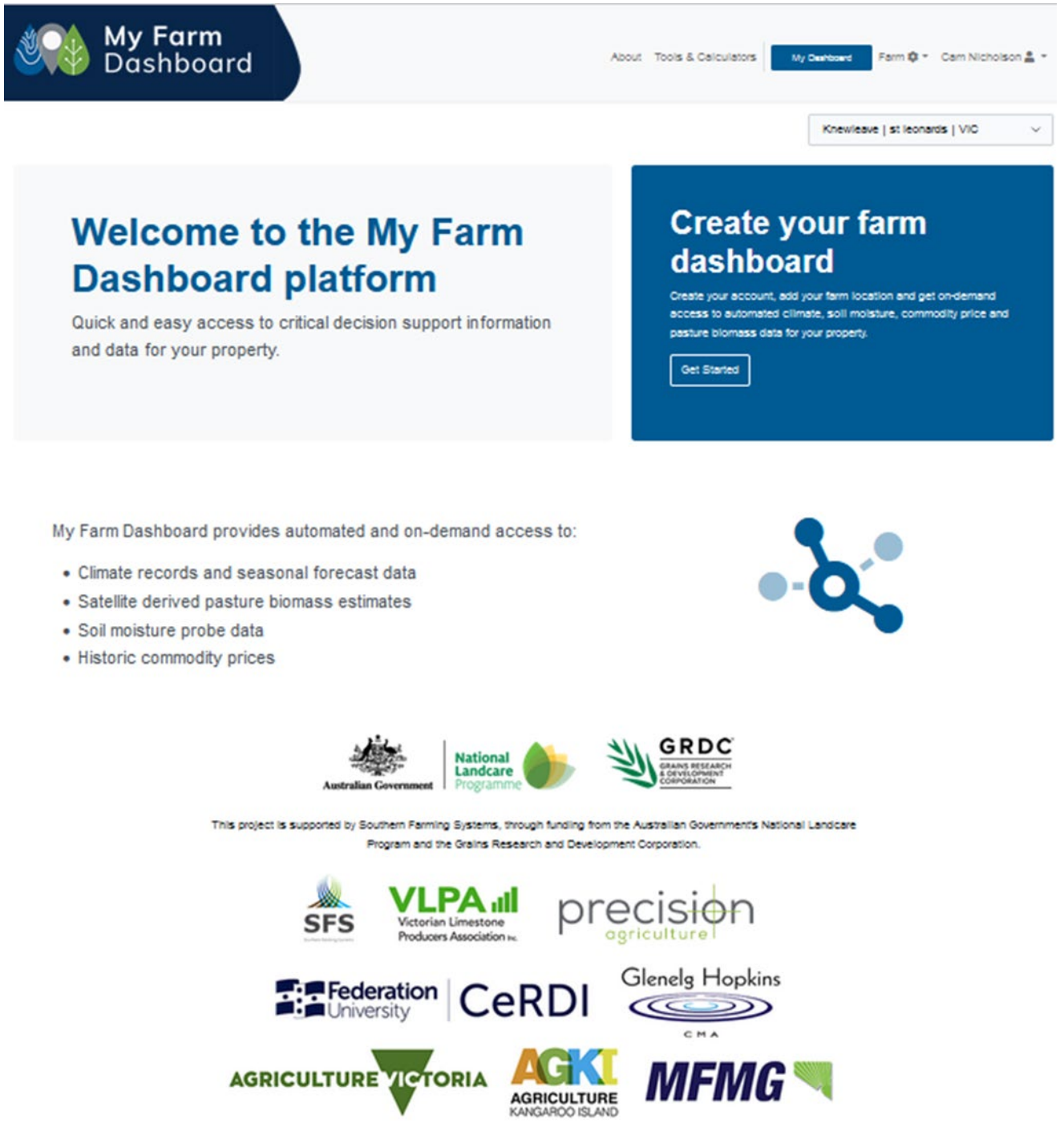
Where can I access the necessary information easily?



My Farm Dashboard

About | Tools & Calculators | My Dashboard | Farm | Cam Nicholson

Knewleave | 850 Murradoc Rd St Leo

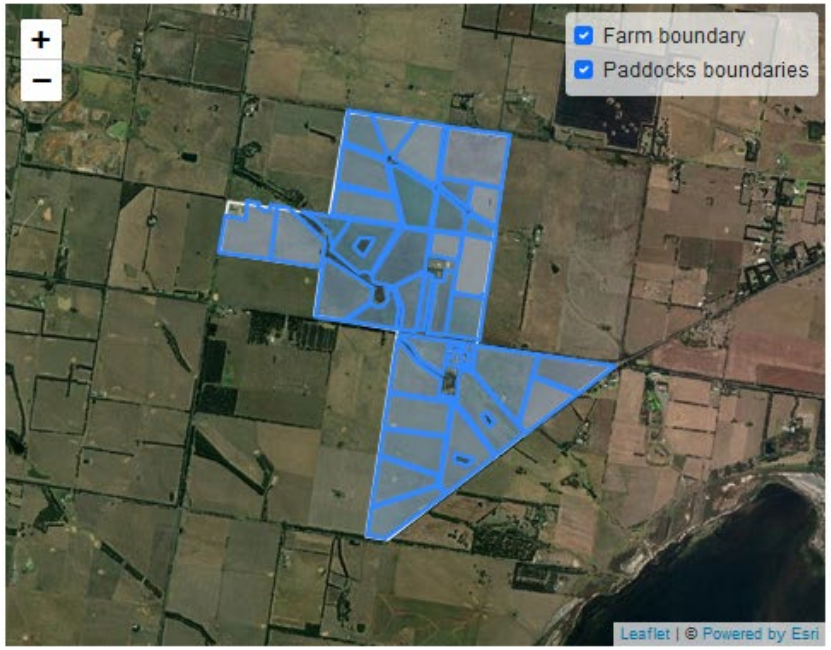
Data Dashboard - Knewleave

To get started click on **Add a data card** to display data for your property

Change card layou | Add a data card

Farm map

View more detail



Card type All

Knewleave | 850 Murradoc Rd St Leo

Commodity prices

Commodity prices - Grains Average weekly index price ($/t) for selected location. Data provider a...

Ag price

Monthly rainfall

Modelled (ACCESS-S1) 30, 60 and 90 day rainfall predictions for the selected location (forecast data...

Climate

Rainfall deciles

Modelled (ACCESS-S1) 30, 60 and 90 day rainfall predictions for the selected location (forecast data...

Climate

Seasonal forecast

Modelled (ACCESS-S1) 30, 60 and 90 day rainfall predictions for the selected location (forecast data...

Climate

Solar radiation

Modelled (ACCESS-S1) 30, 60 and 90 day rainfall predictions for the selected location (forecast data...

Climate

Stress events

Modelled (ACCESS-S1) 30, 60 and 90 day rainfall predictions for the selected location (forecast data...

Climate

Farm map

Farm

Pasture biomass estimates

Weekly satellite-based total farm standing dry matter (average TDSM kg/ha) and Feed on Offer (FOO to...

Pasture

Soil moisture probe data - PAW

Soil moisture probe Soil moisture data collected from regional soil probe sensor networks located w...

Soil Moisture

Soil moisture probe data - Soil temperature

Soil moisture probe Soil moisture data collected from regional soil probe sensor networks located w...

Soil Moisture

Soil moisture probe data - Stacked soil moisture

Soil moisture probe Soil moisture data collected from regional soil probe sensor networks located w...

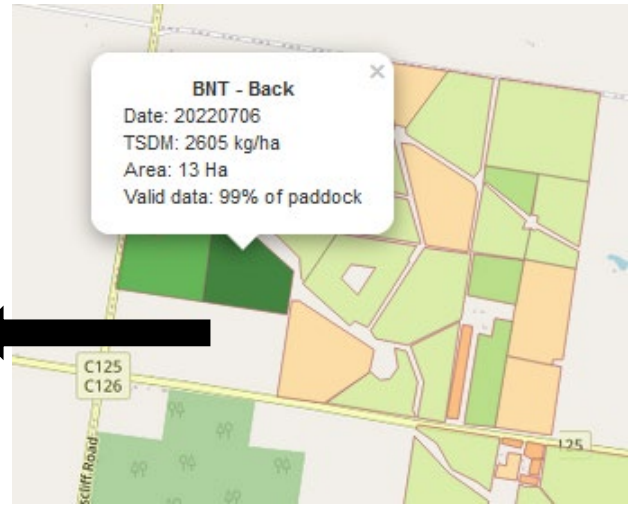
Soil Moisture

Soil moisture probe data - Summed soil moisture

Soil moisture probe Soil moisture data collected from regional soil probe sensor networks located w...

Soil Moisture

How does the *My Farm Dashboard* help?



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