New Acland Mine Site

Grazing Trials

Tom Newsome

Outcross Resources offers four services

Risk Assessment, mitigation and benchmarking of your land

Development, design and implementation of formal R&D trials for grazing, cropping, forestry or native vegetation on rehabilitated overburden mining land (excluding tailings facilities)

Management of end to end compliance and reporting for agricultural rehabilitation activities stemming from R&D trials

Management of stock, crops and vegetation on rehabilitated overburden mined land

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Grazing Trial Overview

AIM OF TRIALS → Measure Productivity, Viability and Sustainability

FOCUS AREAS → Soils, Pastures and Livestock

OUTCOME → Promoting commercial agricultural and environmental outcomes following mining activities

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Land Management Case Study – New Hope Acland

Rehab Paddocks

Active Mine Site
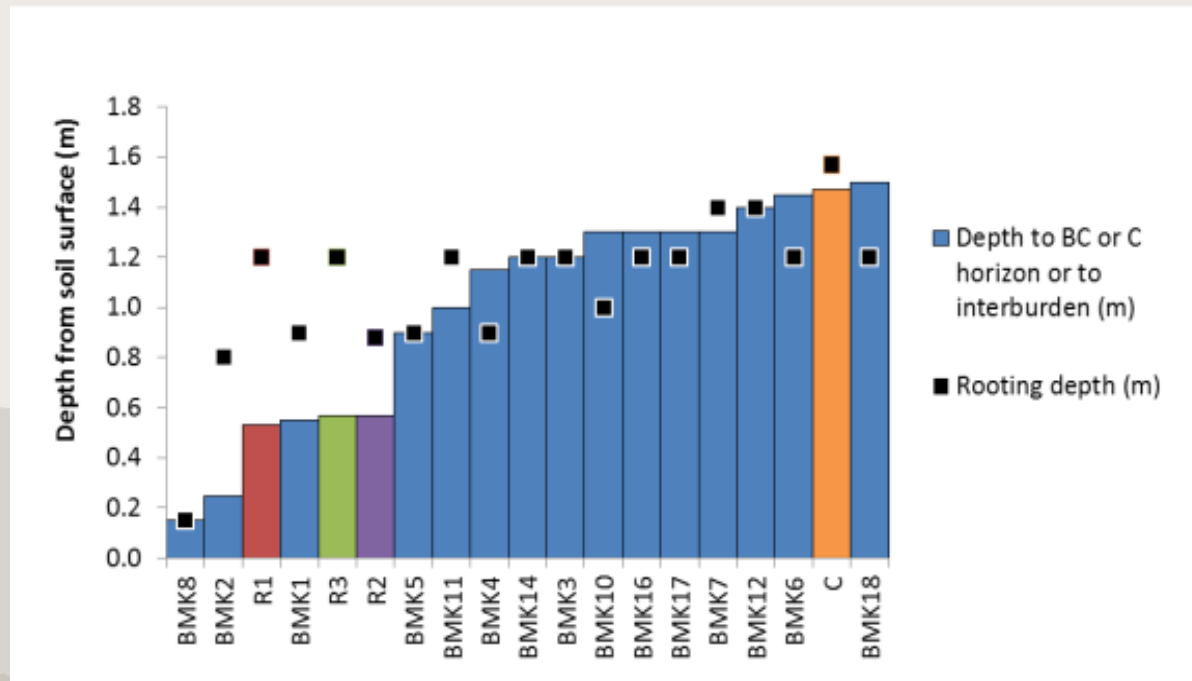
Control Site

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Soils Methodology

18 soil pits were used to benchmark the control and rehab sites

We validated that the control site was representative of the overall area

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Control Validation

The control site was validated to be representative of the surrounding land types

Pasture Methodology

Pasture production, quality and subsequent stocking rate was determined by regular pasture cuts prior to each grazing event, using the botanal process

Annual pasted production was calculated using exclosures based on the swiftsynd technique

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Livestock Methodology

Angus steers were purchased

- Held for 12 months to emulate a backgrounding enterprise

- Grazed on the trial sites 4 times per year for approx 42 days

- Grazed once in each season

- Also tested
  - Grain finishing
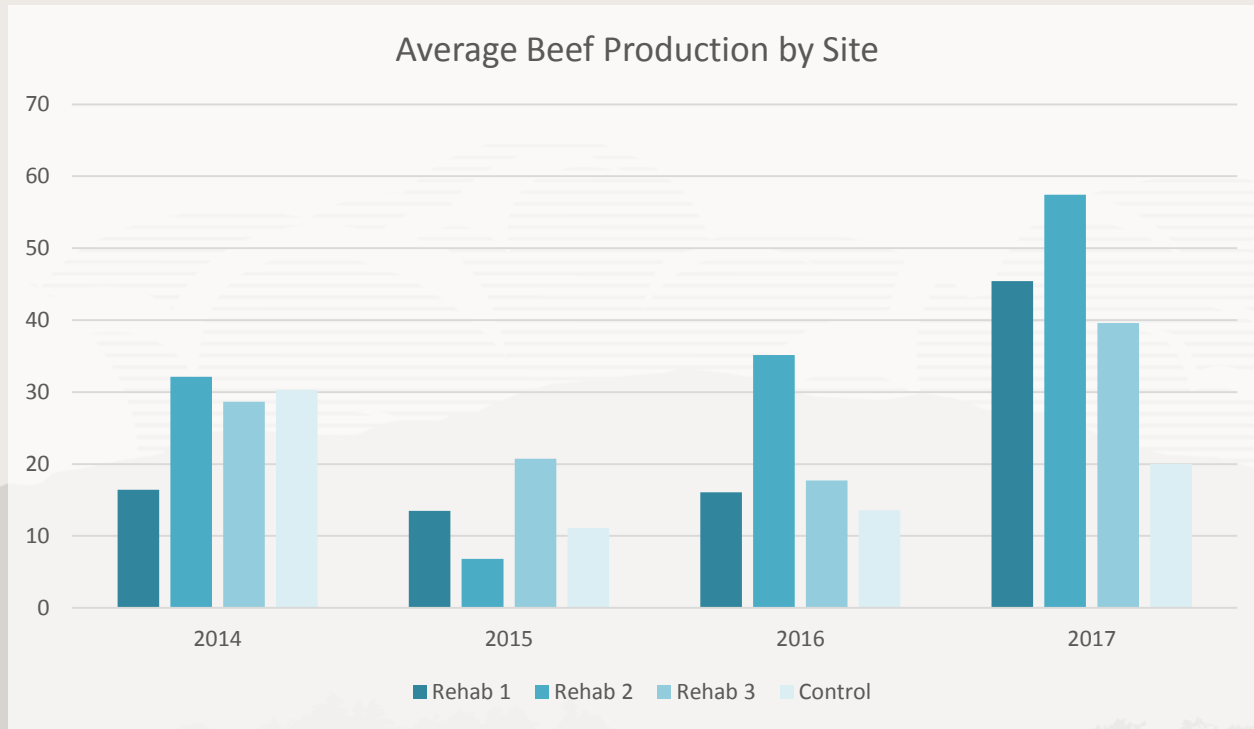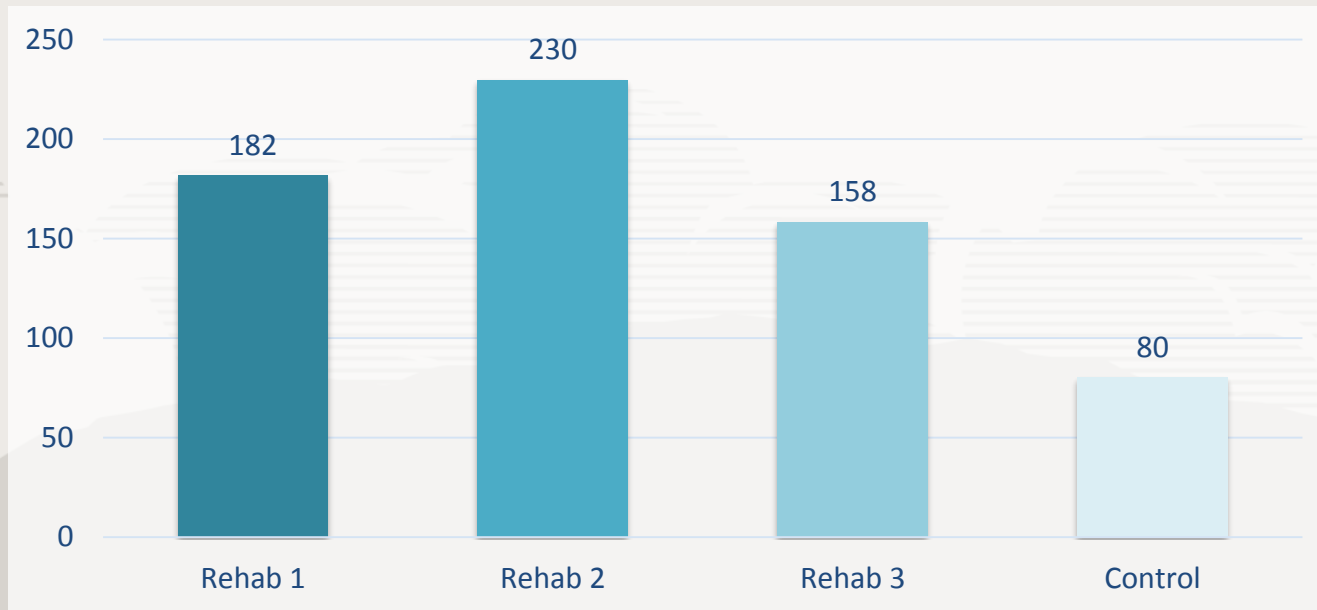 - Grass finishing over two years
  - Breeding

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Results

Stocking Rate

Number of Head and Stocking Rate
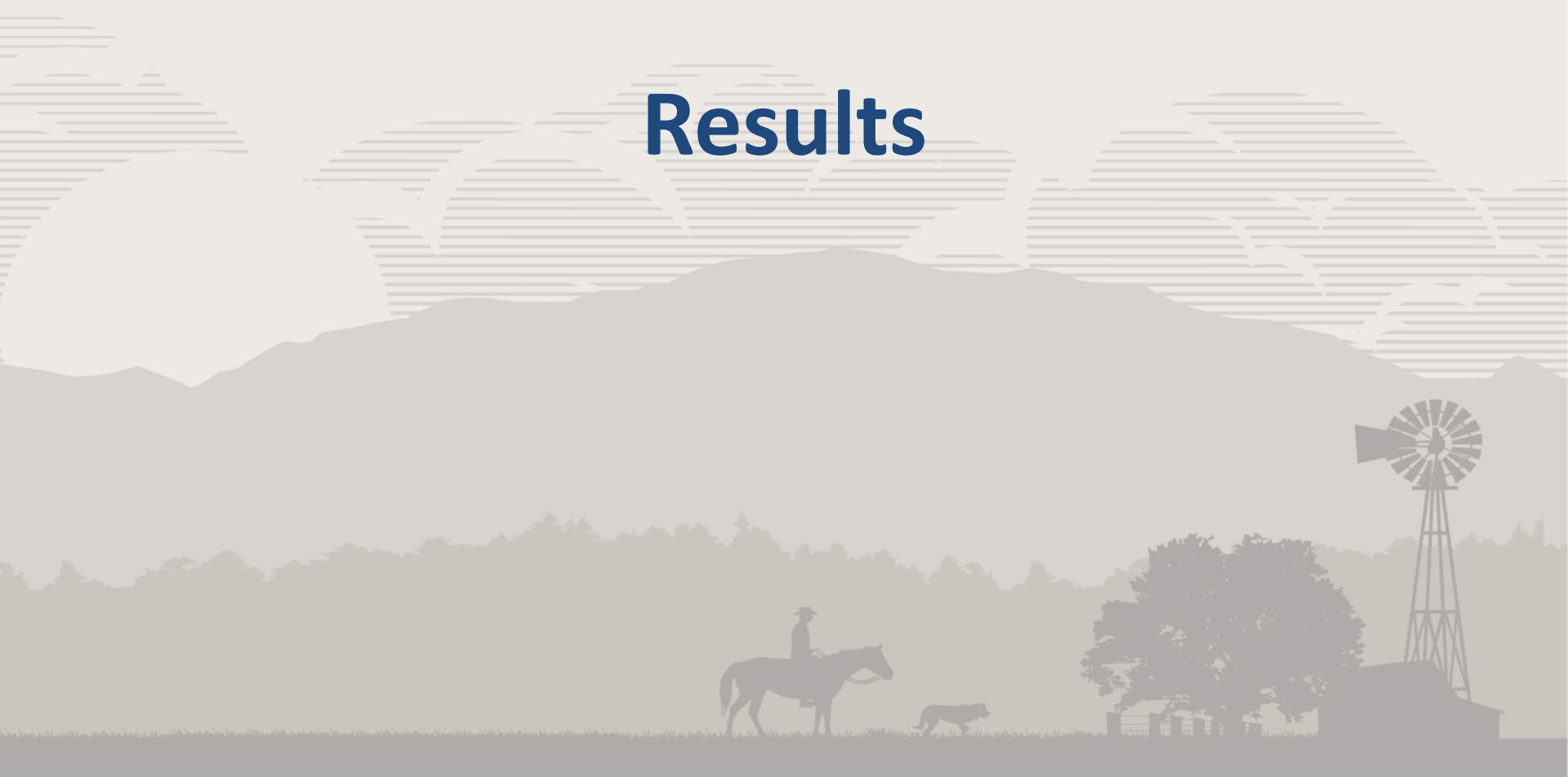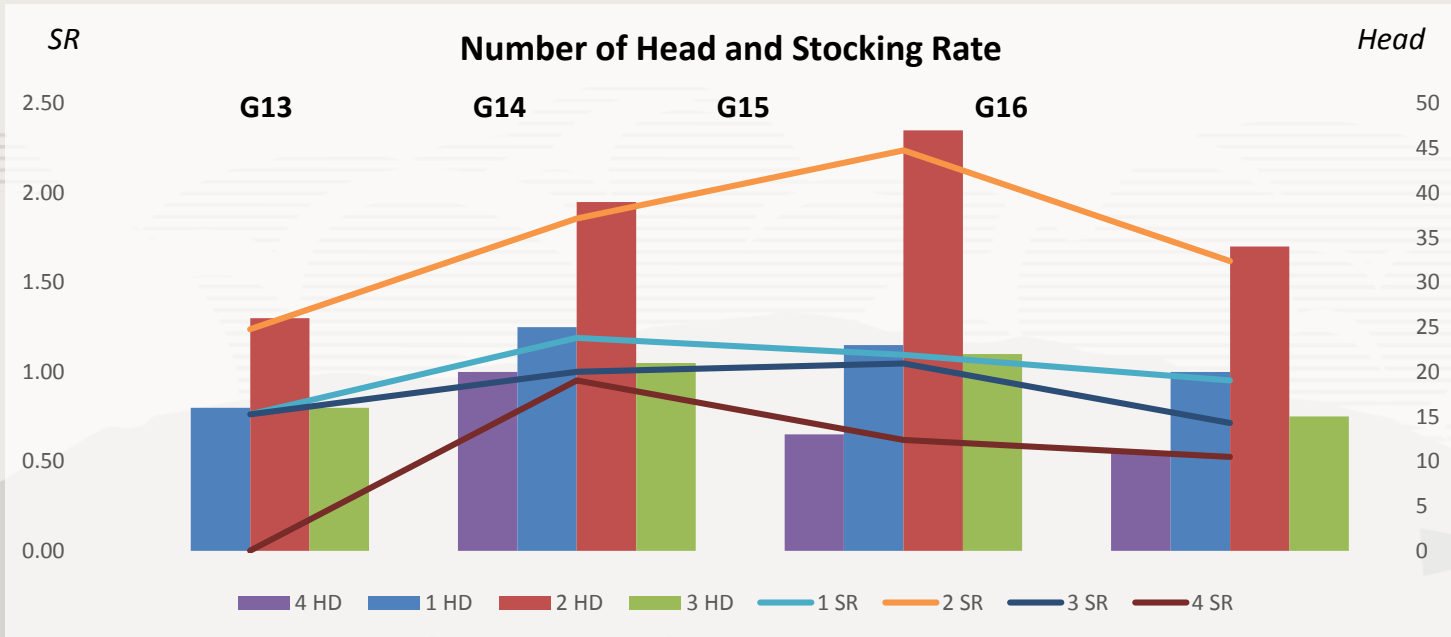
Rehabilitated sites outperformed the unmined control site

Weight Gain

Average Beef Production by Site

Rehabilitated sites outperformed the unmined control site

Total Beef Production

Measuring a combination of weight gain and stocking rate
Rehabilitated sites outperformed the unmined control site

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Meat Quality

Carcasses were graded under the MSA GRADING system to determine eating quality

Potential Contaminants

36 liver samples tested for potential contaminants including:
Copper, lead, arsenic, mercury, zinc, cadmium

Of 216 samples, 4 were slightly outside the expected range for copper. Remaining 212 samples were in range

Pasture Production

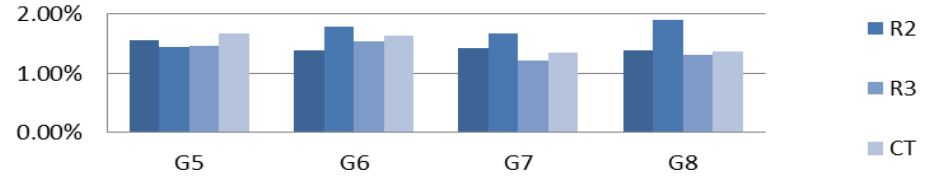Rehab site 2 was most productive when measured by:
- Presentation yield through Botanal technique; and
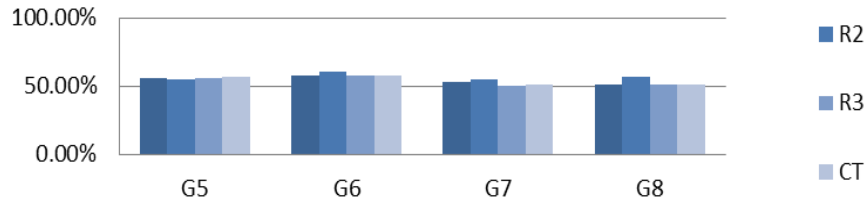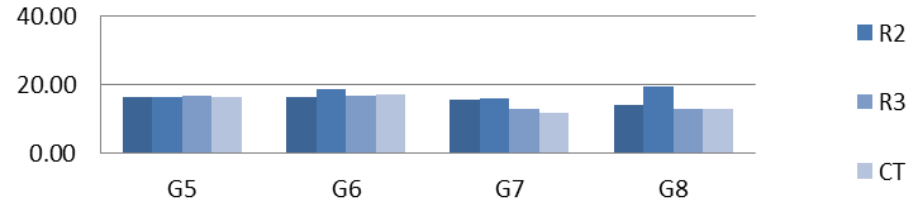- Annual pasture yield through contained swiftsynd site

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Pasture Production
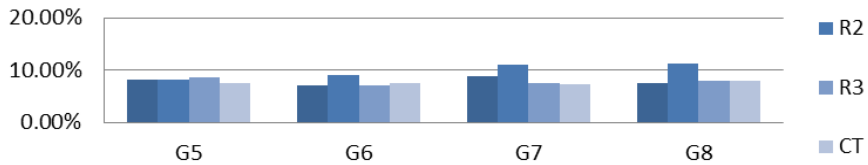
Underlying measures of fertility supported weight gain results

Soil Fertility

Mineral N, PMN, Phosphorus, Potassium, Sulfur

Soil development
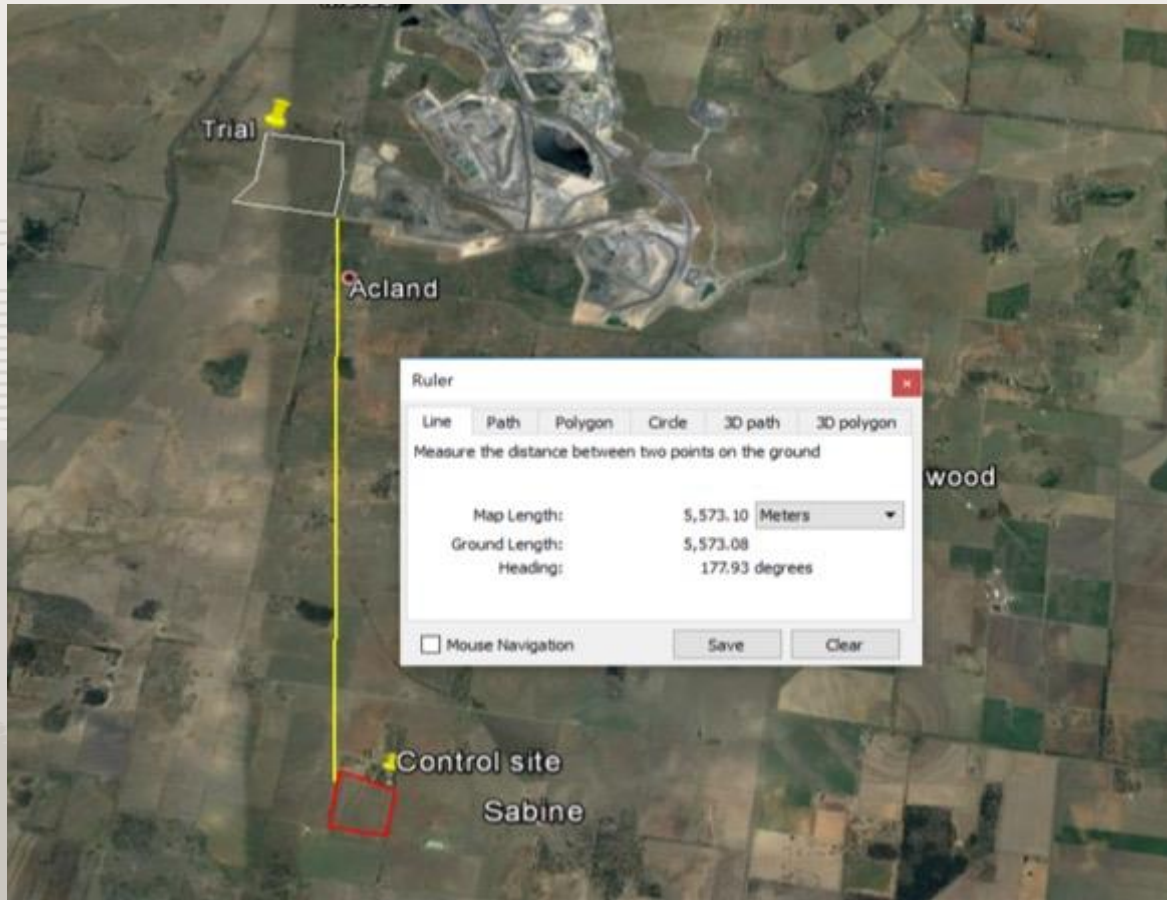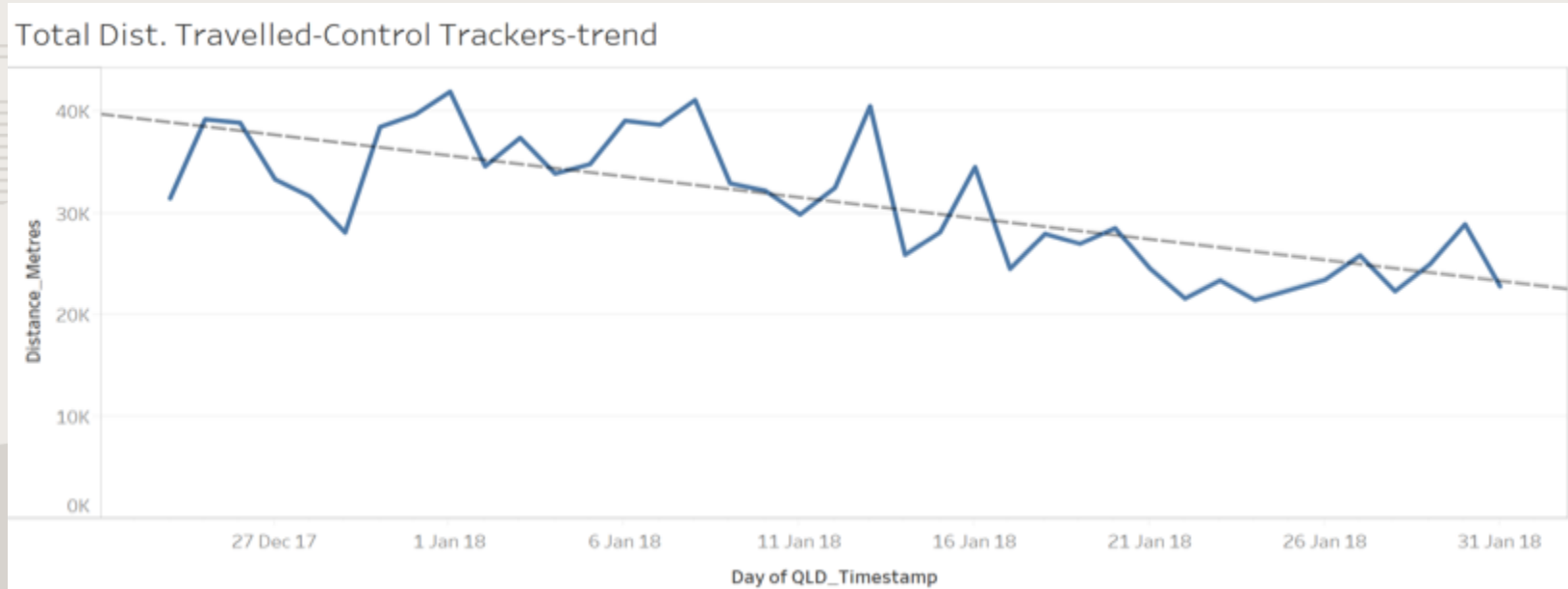

We observed root penetration into the interburden and a darkening of the soil horizon

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Noise & Dust Monitoring

No significant difference in grazing patterns

Noise & Dust Monitoring

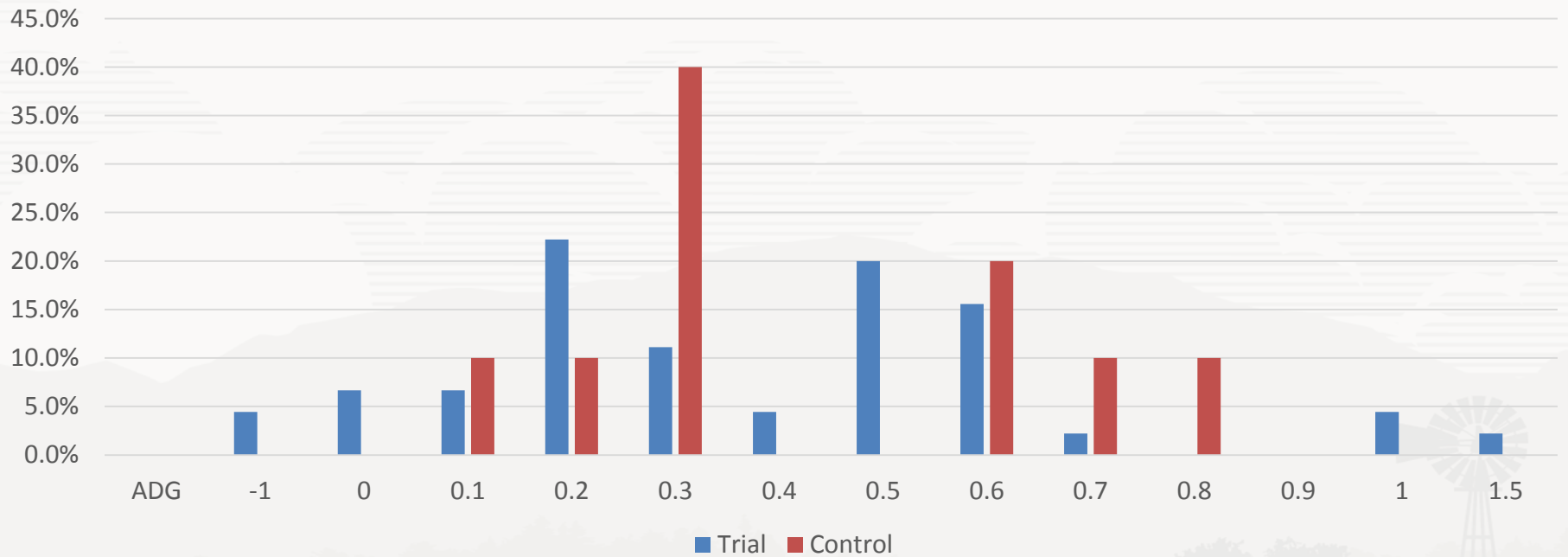Total Dist. Travelled-Control Trackers-trend

https://www.youtube.com/watch?v=2e_Od3IvMt8

No significant difference in grazing patterns

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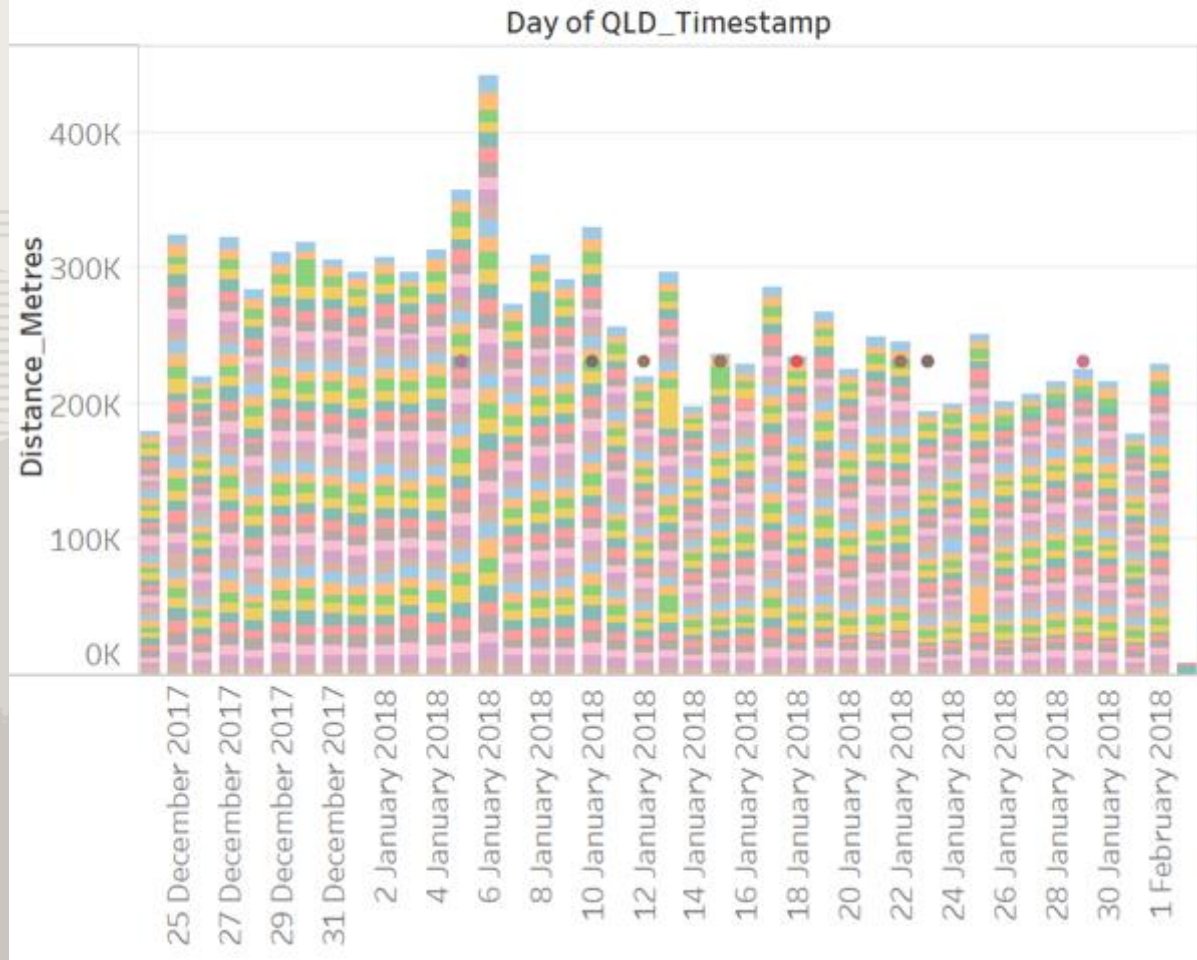# Noise & Dust Monitoring

Average Daily Weight Gain

No significant difference in weight gain

Noise & Dust Monitoring

Trial Trackers _ Distance_by_day

No identifiable change in behaviour following blast events
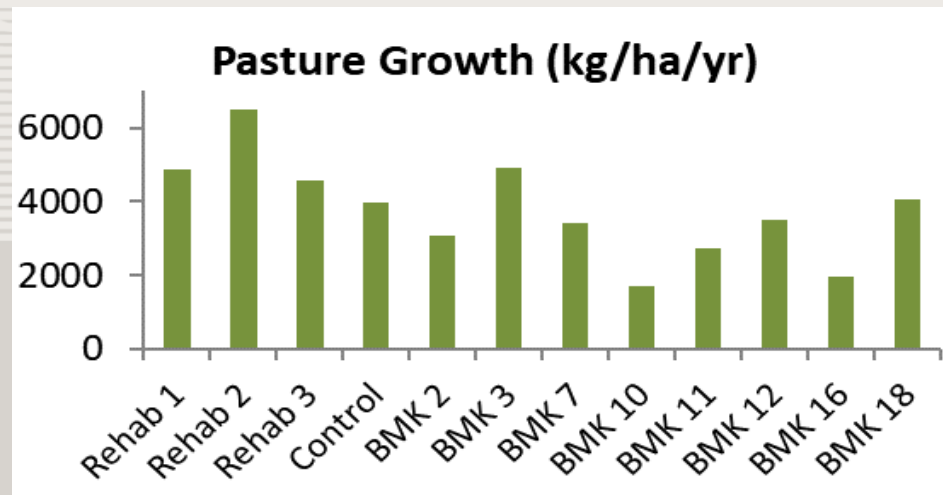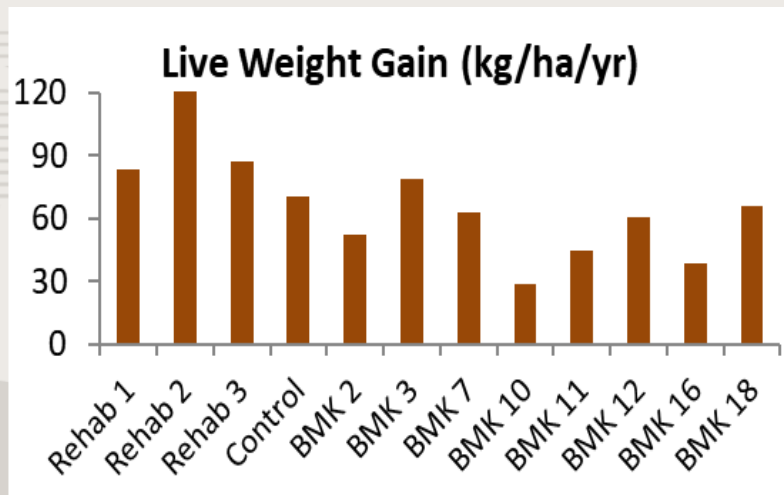
Modelling future performance with GRASP

FIG 1. Initial estimates from GRASP simulations of mean annual (2014-17) pasture growth and cattle live weight gain for the three rehab paddocks, control paddock and 8 benchmark (BMK) sites.

Summary

This is the most detailed study of its kind to date in Australia

We have successfully managed it for >7 yrs

We have developed a process aligned with regulator requirements

We have a repeatable service to offer other prospective clients

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