Validating grazing effects on soil nutrients (& ground cover) on farms

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This event is supported by the Goulburn Broken CMA with funding from the Australian Government's National Landcare Program.

Background

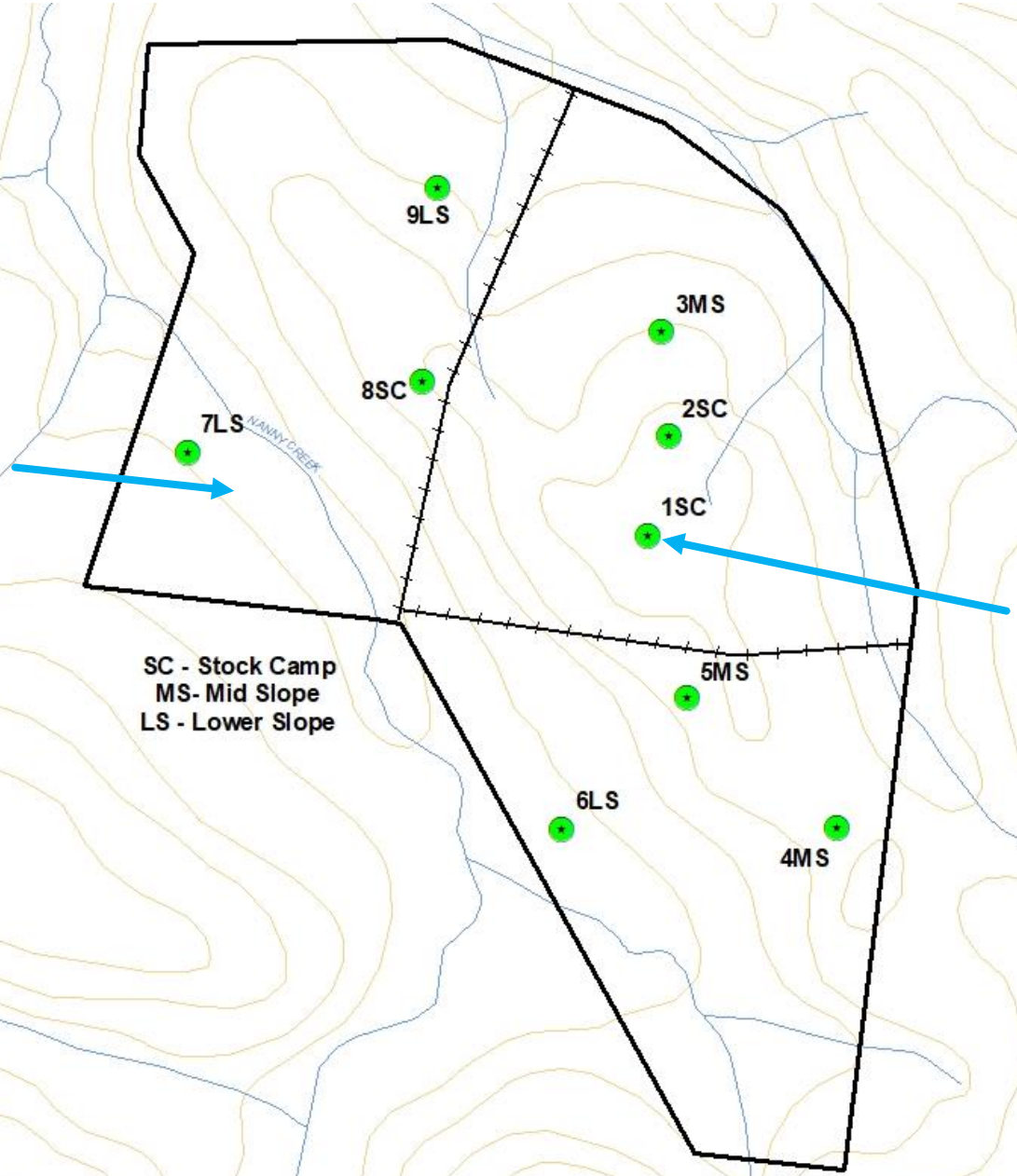
- Site: 40-hectare pdk in Kilmore East,
  typical of sedimentary hill country in SW Goulburn.

- Issue: uneven grazing pressure & uneven nutrient distribution
  - Sheep (stock) camps - high nutrients & overgrazed vs lower slopes/sth facing slopes
  - Large paddocks - land-classes & soil types vary
    - soil sampling at pdk scale doesn't indicate variation in nutrients/pH.
  - Applying fertilisers and/or lime at an 'average' rate over pdk - inefficient

- Aim: demonstrate impact of improved grazing management on soil nutrient levels and ground cover across the site

What was done

- 2017: 40 ha hill pdk split into 3, based on land-class. Tree belts planted.
- 2018 : Soil tested GPS 0.5 ha grid, re-tested 2023
- Rotationally grazed, mainly cattle
- 2017 Super moly ; 2018 & 2022 Super
- 2019: Lime applied
- 2018 -2023: Pasture assessments
  - perennial grass basal cover (phalaris, cocksfoot, fescue, native grasses),
  - persistence (plants/m2)
  - pasture composition & ground cover %

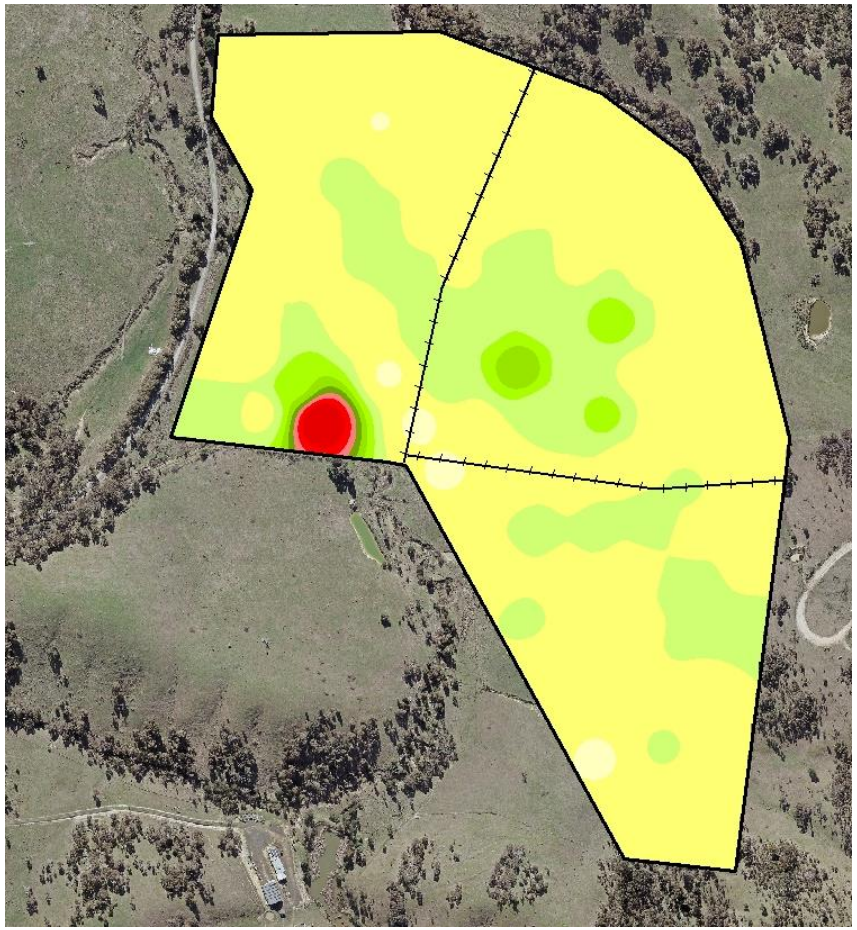


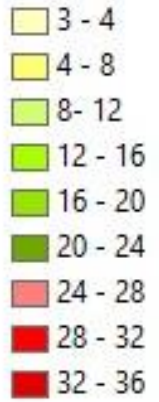
March 2020 –early autumn break

Changes in soil phosphorus levels (Olsen P mg/kg)

2018

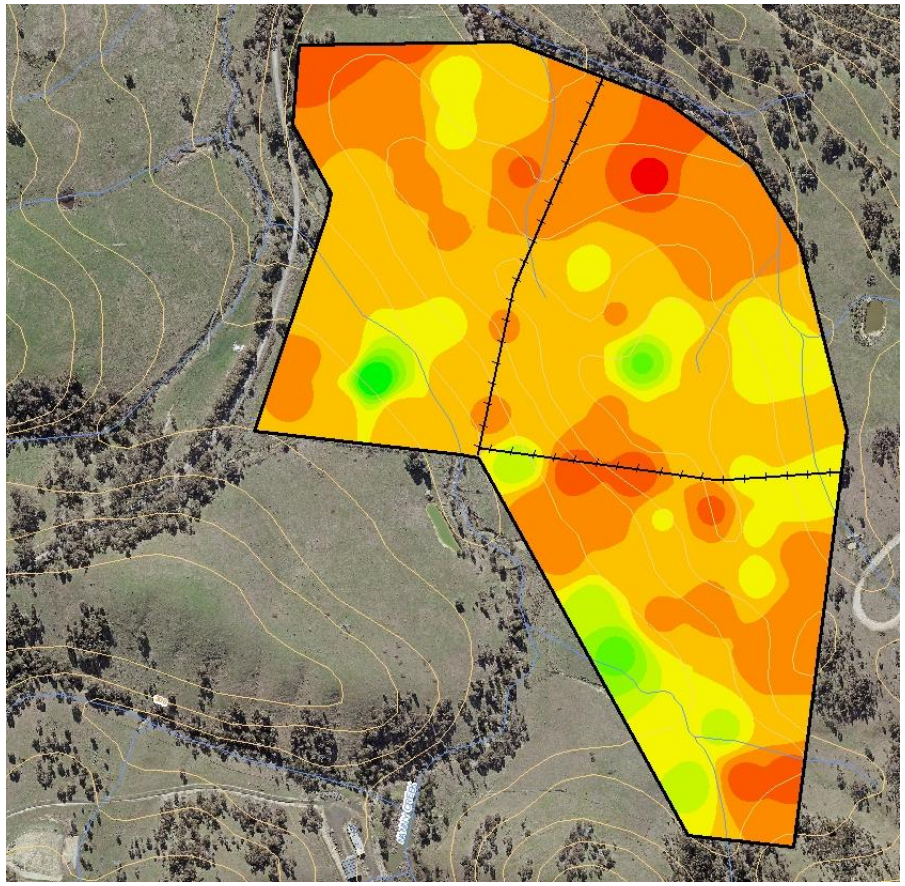
2023



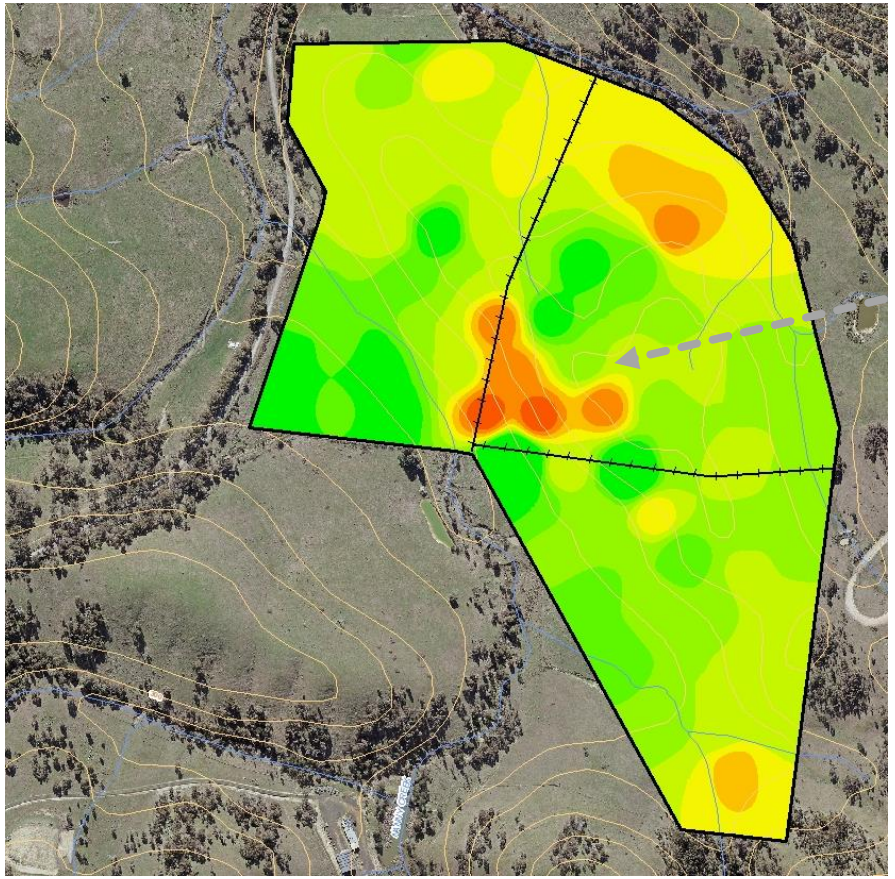


Changes in soil pH ($CaCl_2$)

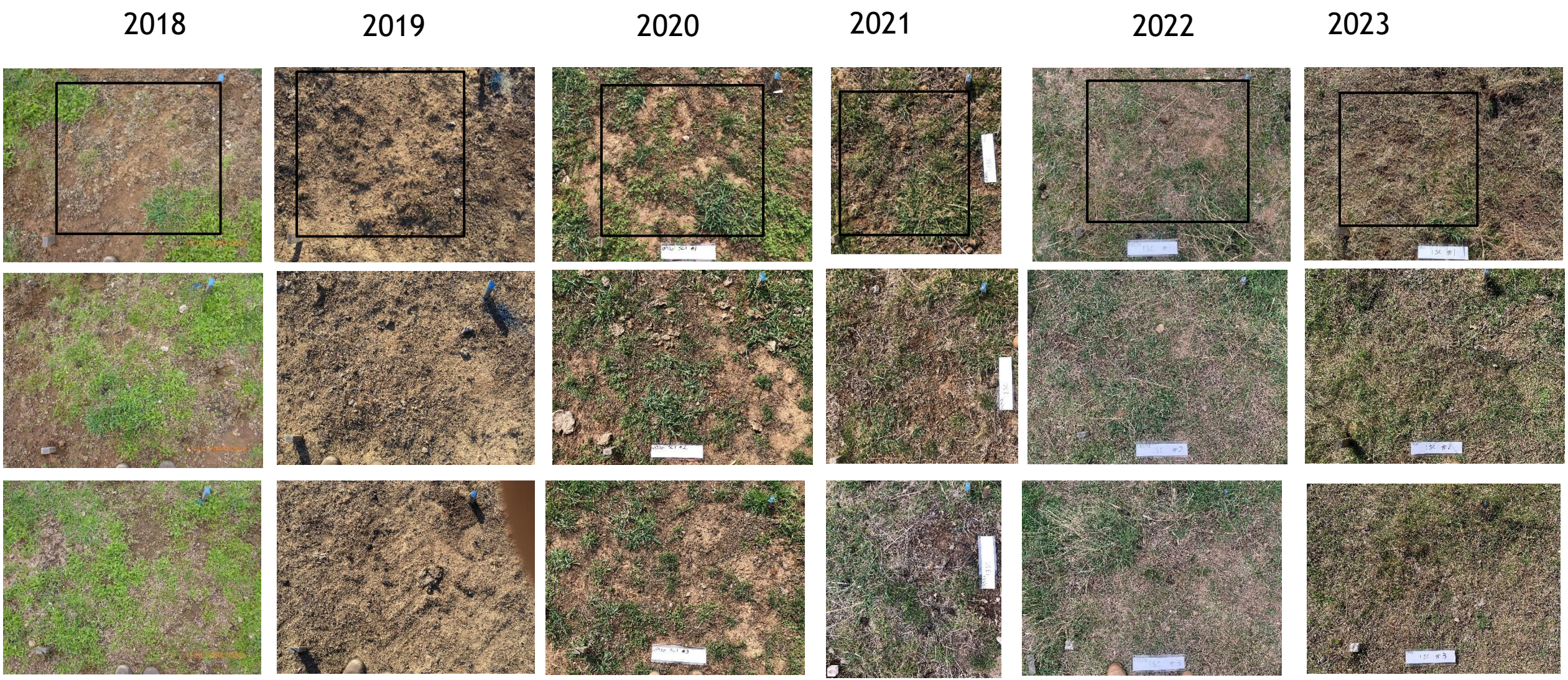
2018



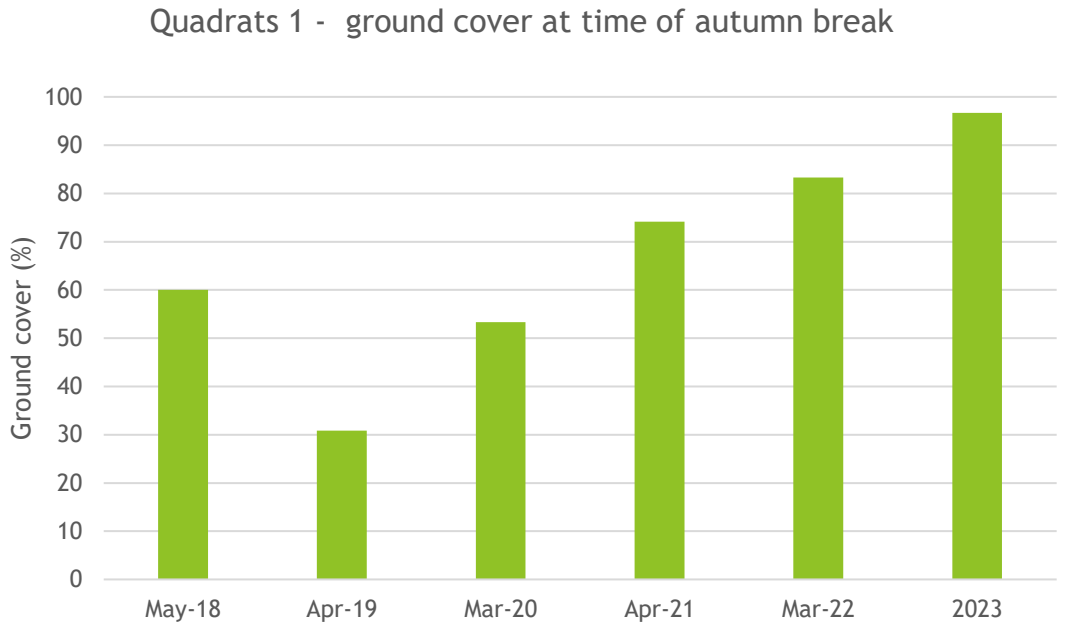
2023

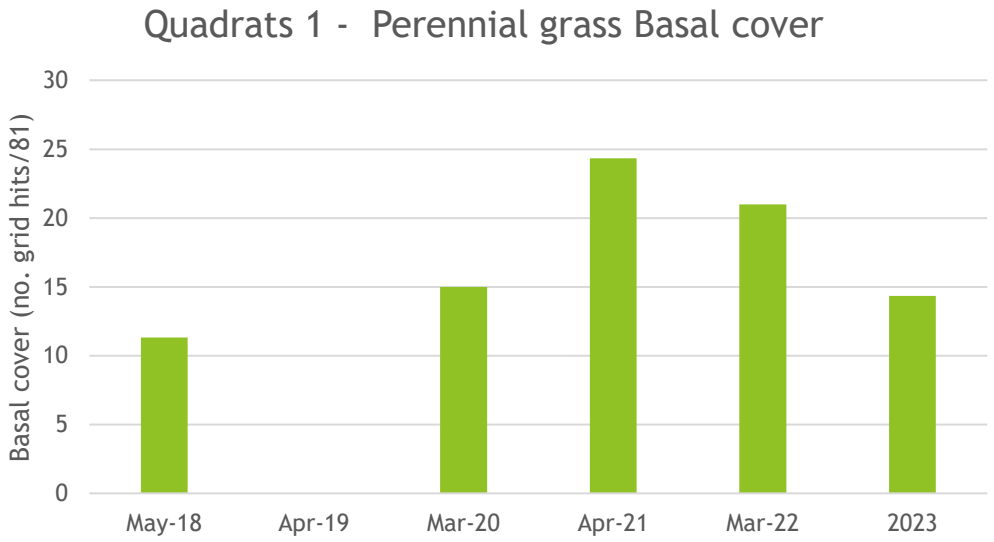


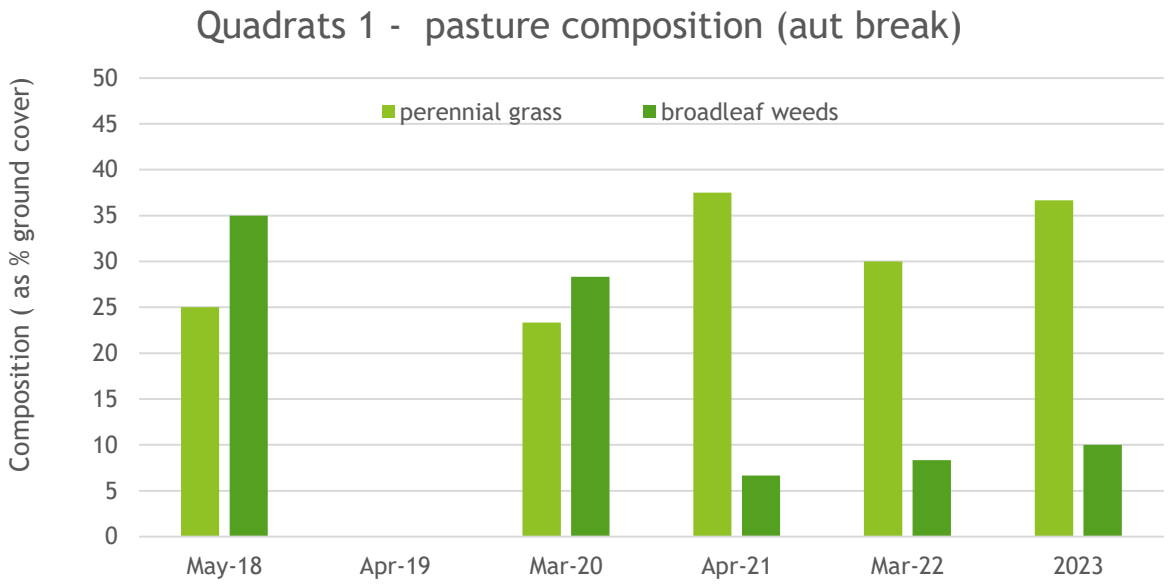
Sheep camp area – changes in ground cover




Phalaris content improved
(autumn break - March 2020)
- sheep camp area (middle
pdk)


Quadrats 1 - ground cover at time of autumn break
Ground cover (%)
100
90
80
70
60
50
40
30
20
10
0
May-18
Apr-19
Mar-20
Apr-21
Mar-22
2023


Quadrats 1 - Perennial grass Basal cover
Basal cover (no. grid hits/81)
30
25
20
15
10
5
0
May-18
Apr-19
Mar-20
Apr-21
Mar-22
2023


Quadrats 1 - pasture composition (aut break)
Composition (as % ground cover)
perennial grass
broadleaf weeds
50
45
40
35
30
25
20
15
10
5
0
May-18
Apr-19
Mar-20
Apr-21
Mar-22
2023

Conclusions

- Increase in perennial grass tiller bases & ground cover & decrease in annual b'leaf weeds in all 3 pdks *(consistent with Broadford grazing expt results)*
- With right package of management - land class fencing, rotational grazing strategic nutrient application (& appropriate pasture species selection)
  – common problems in sed. hill country can be mitigated & productivity improved.

- Think about pdk layout/subdivision – could it be improved to better manage grazing & inputs.
- In absence of grid GPS soil data
  – can soil test different zones within a pdk (diff soil types, poor areas vs good areas)
  & record location to be more targeted with fert or lime.
- Don't fertiliser obvious sheep/stock camp areas.

The demonstration site was supported by the Goulburn Broken CMA with funding from the Australian Government's National Landcare Program

Thank you to Brian & Elyse Kelly