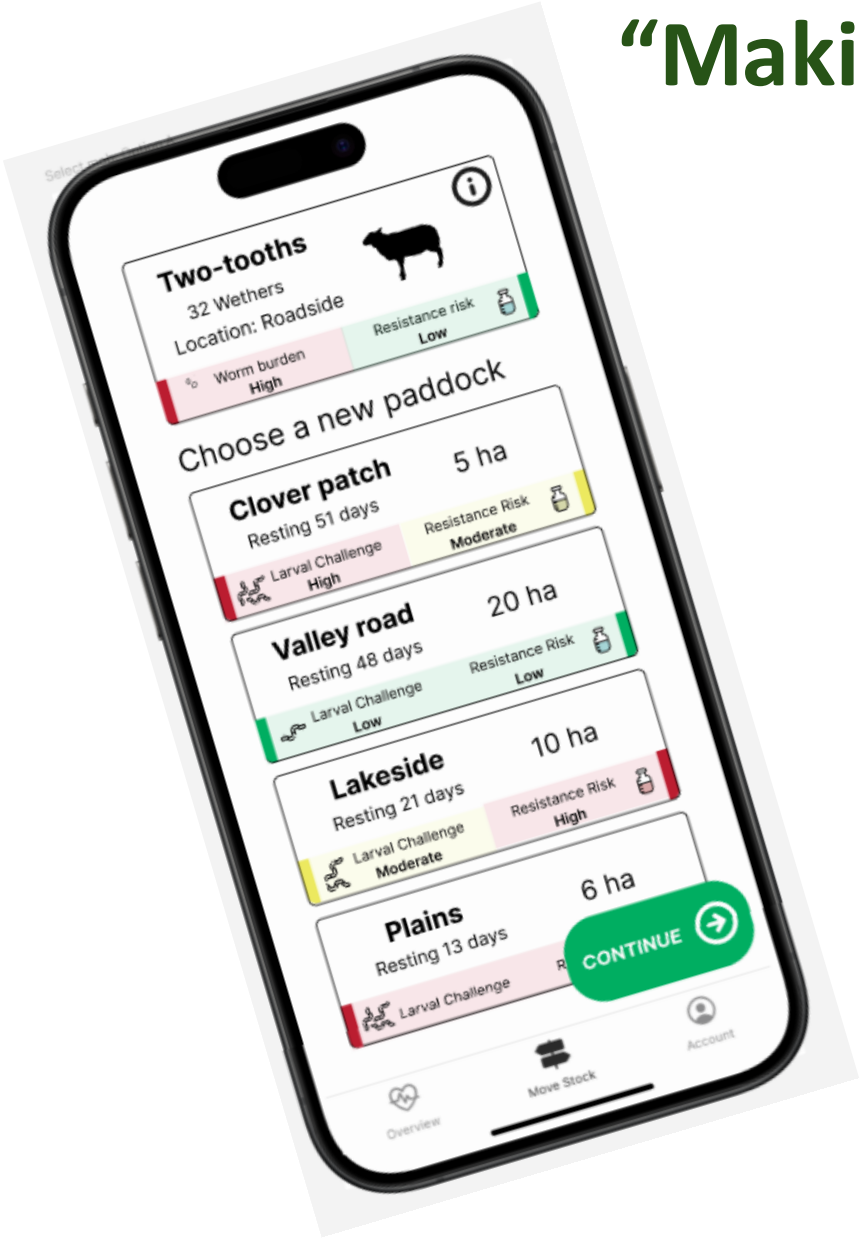
DAGI – Drench & Grazing Integration

“Making the Invisible, visible”




DAGI
Why DAGI?
1 IN 3 NEW ZEALAND FARMS HAVE TRIPLE DRENCH RESISTANCE
DAGI can help. Come see us at the innovation hub to learn more.
www.dagi.nz
Beef + Lamb New Zealand is a proud funding partner of DAGI
beef+lamb new zealand

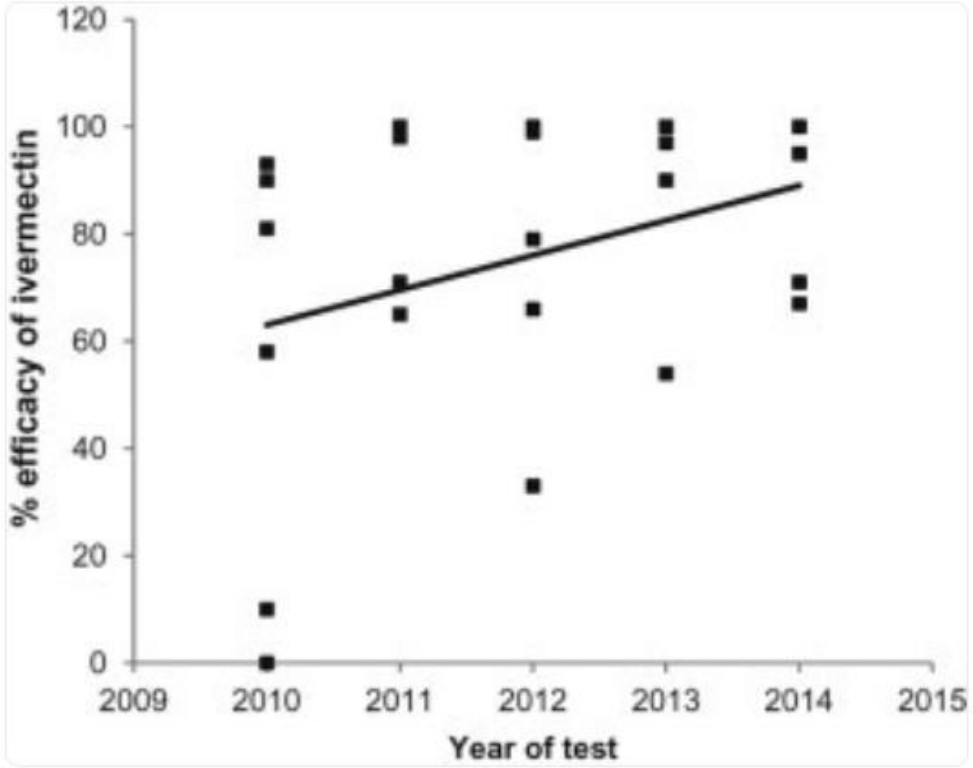
But it's not all doom and gloom……

Evidence for reversion towards anthelmintic susceptibility in *Teladorsagia circumcincta* in response to resistance management programmes

Dave M Leathwick [1], Siva Ganesh [1], Tania S Waghorn [1,*]

Author information · Article notes · Copyright and License information

PMCID: PMC4412914 PMID: 25941625



Wednesday, **13 November 2024**

Drench resistance can lead to gains

By Shawn McAvinue

Rural life

If you implement good practices, it IS possible to "revert" the farm AND be profitable

wormwise
national worm management strategy

beef+lamb new zealand

Wormwise Strategies



F eed ✓

A voidance

R efugia

M onitoring ✓

E ffective ✓

D renching ✓

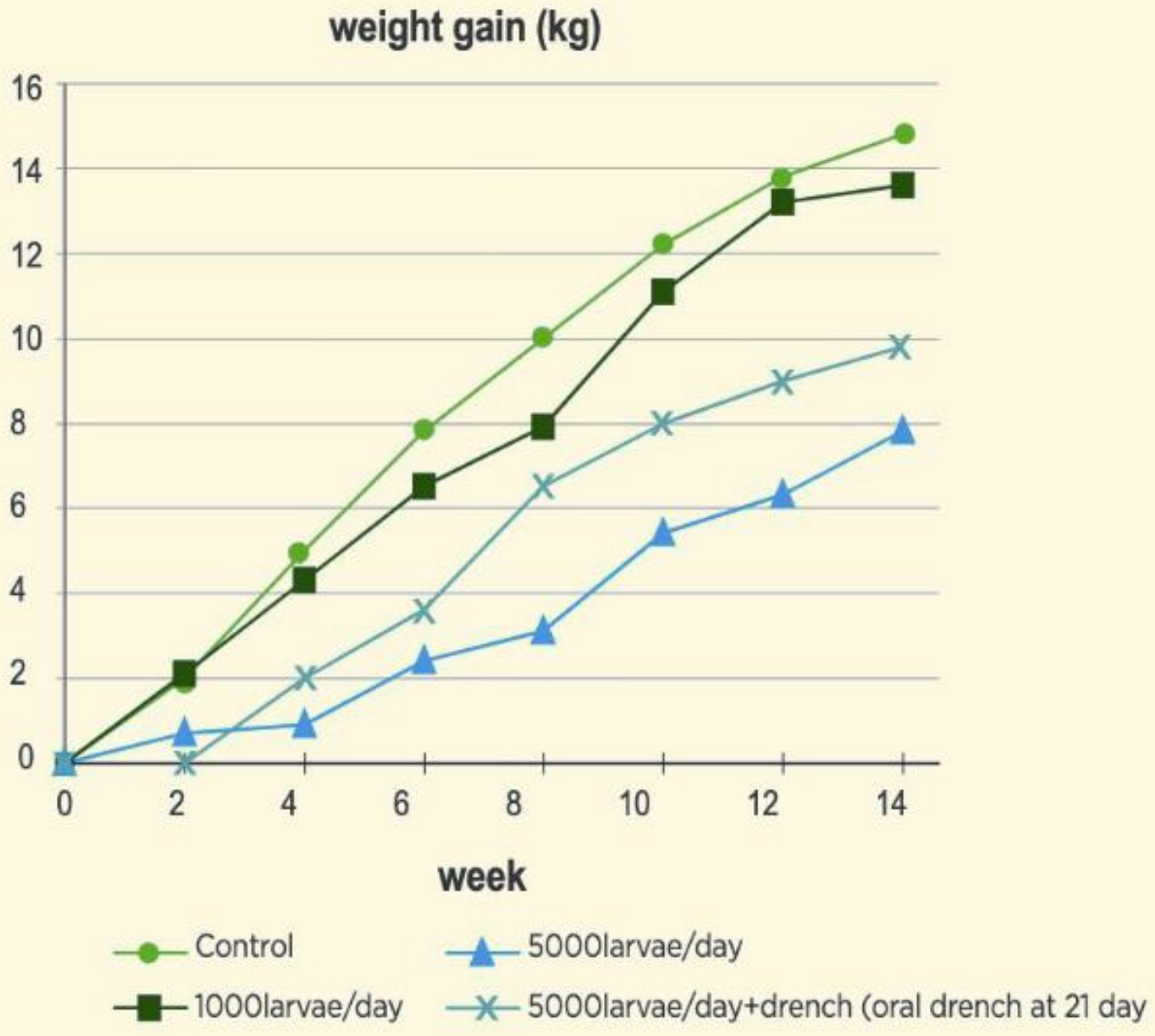
LARVAL AVOIDANCE

Sheep exposed to larvae will grow slower

DRENCHING ALONE WILL NOT COMPENSATE FOR LARVAL CHALLENGE

DAGI

Effect of daily intake of *Ostertagia* larvae and anthelmintic on growth of young lambs (adapted from Coop *et al* 1982)



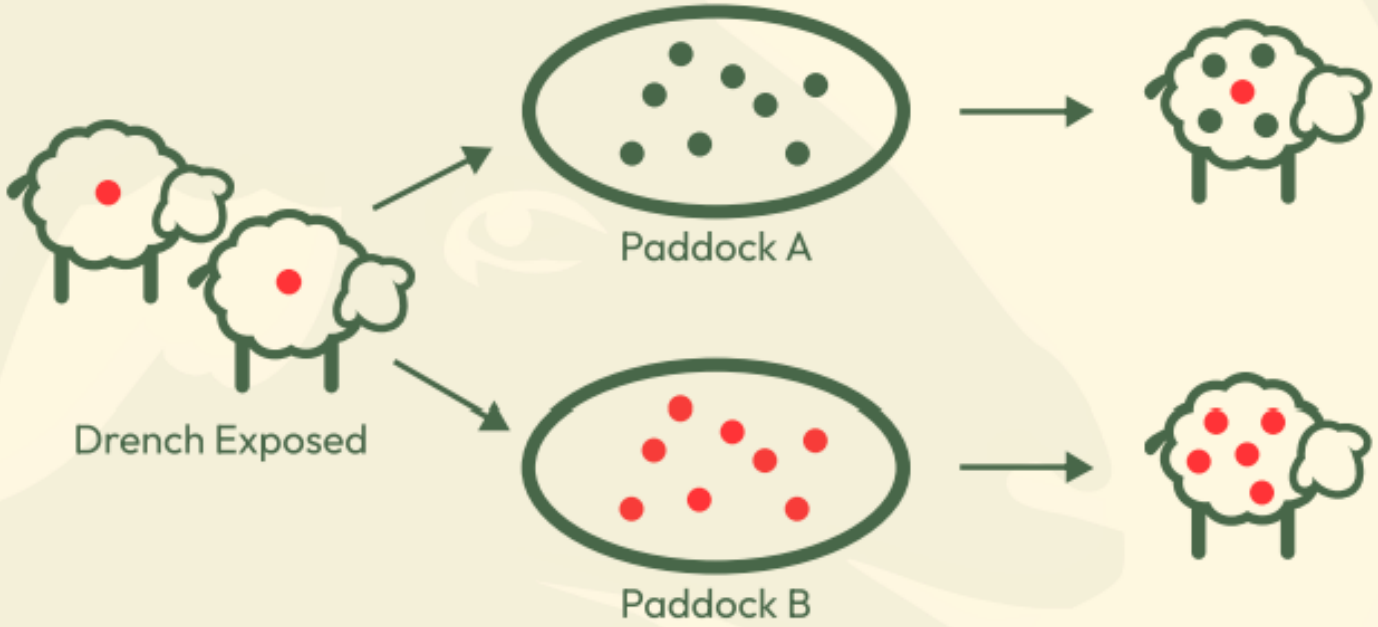
REFUGIA

90% OF THE WORM POPULATION IS FOUND OUTSIDE THE ANIMAL

DAGI

To slow resistance, it is critical to

maintain a pool of non drench exposed worms on your farm



However refugia is only effective if the drenched animals get exposed to non-drenched worms. Therefore refugia must consider paddocks, not just animal status

How can we track “avoidance” & “refugia”?

We need to understand:

- When animals were in a paddock
- Likely FEC at that point (plus faecal volume, number in the mob etc)
- Weather conditions and timing of larval development (and death)
- The interval between grazings
- The drench history of all stock that have been in the paddock (and their grazing history)
- Have other stock classes been in?
- How well are they fed and can they withstand a larval challenge
- CONSTANTLY UPDATED…



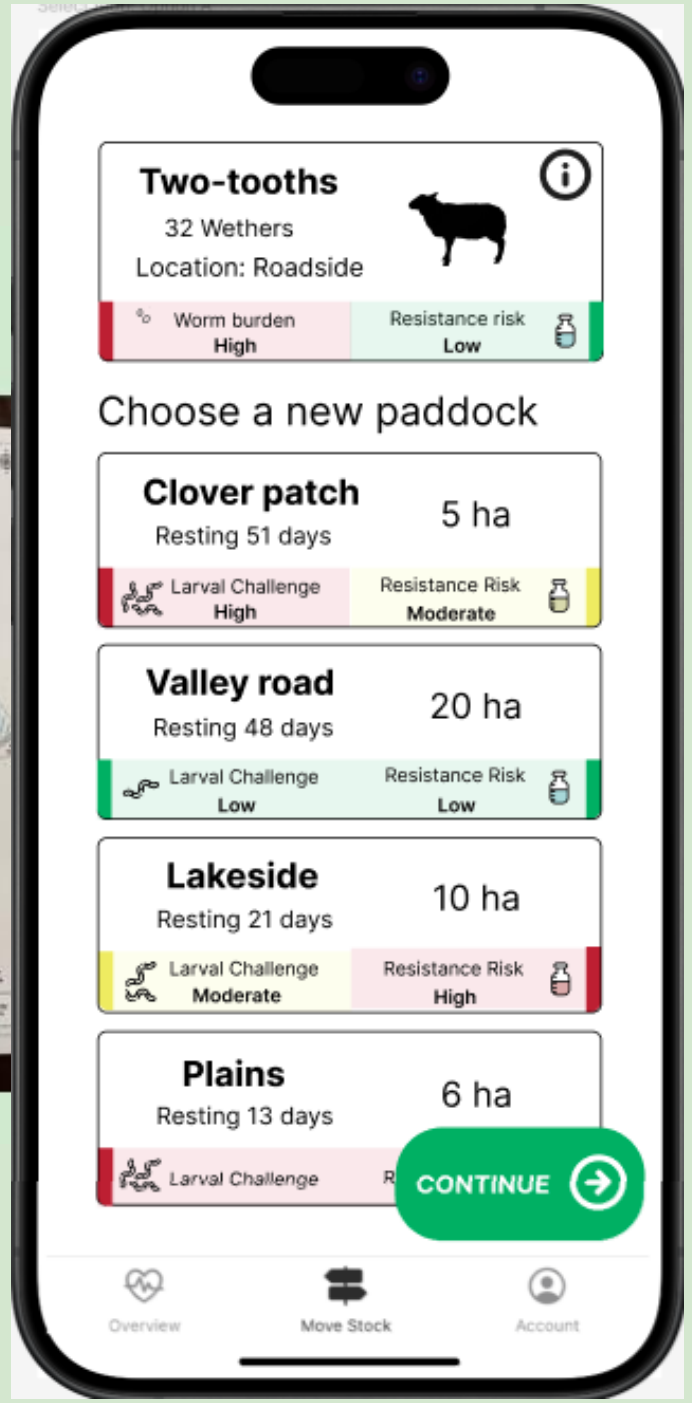
What is DAGI?

How can we track "avoidance" & "refugia"?

We need to understand:

- When animals were in a paddock
- Likely FEC at that point (plus faecal volume, number in the mob etc)
- Weather conditions and timing of larval development (and death)
- The interval between grazings
- The drench history of all stock that have been in the paddock (and their grazing history)
- Have other stock classes been in?
- How well are they fed and can they withstand a larval challenge
- CONSTANTLY UPDATED…





…an APP to automate all these processes

Input Requirements

Daily

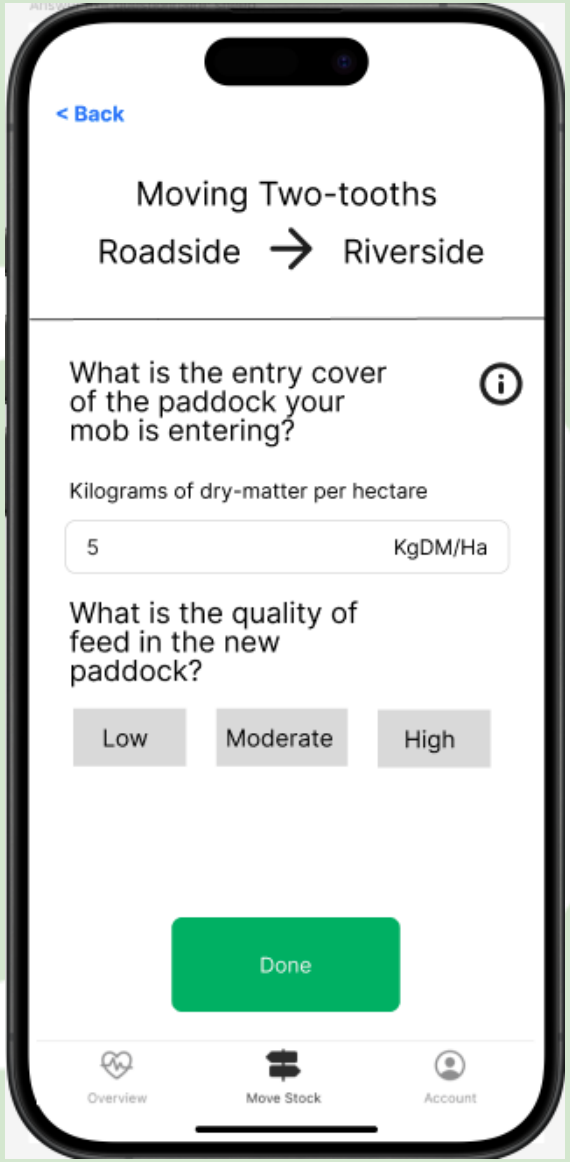
- Mob paddock locations
- Pre-grazing pasture quality and height (kgDM/ha)

When Available

- Drenching dates and dosages
- Faecal Egg Count (FEC) results
- Crop information

DAGI then automatically pulls in:

- Weather data
- Animal feed demand
- Worm life cycle patterns

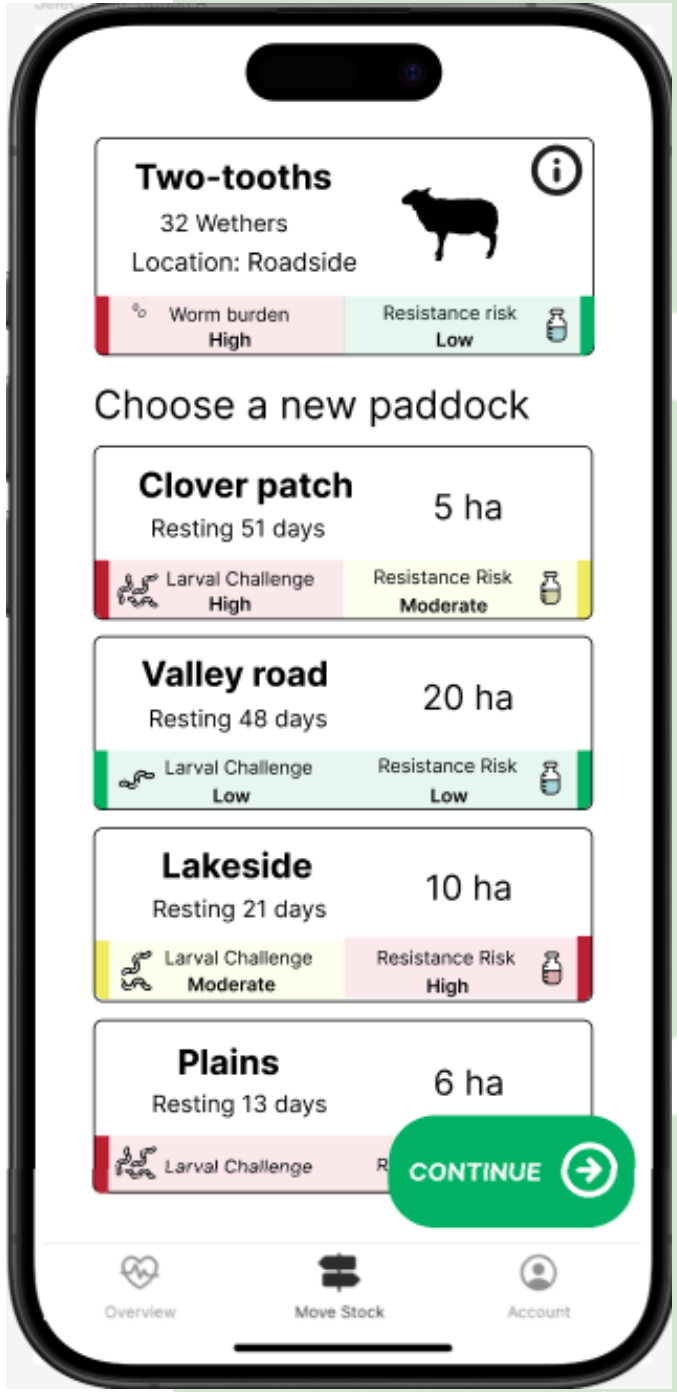


NB: Farm management software integration discussed at the end!

Traffic Lights/ Heat Maps system

Avoidance

“Larval Challenge”
OR
“Worm Burden”



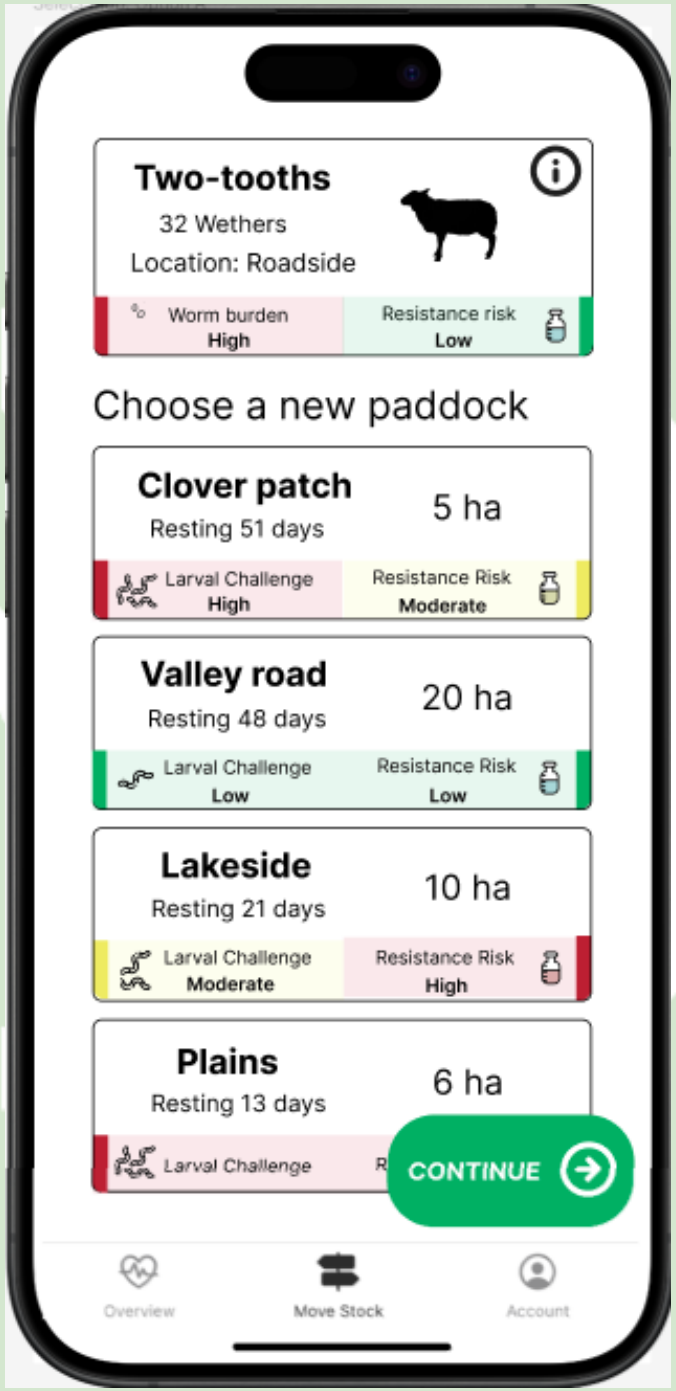
Refugia

“Resistance Risk”

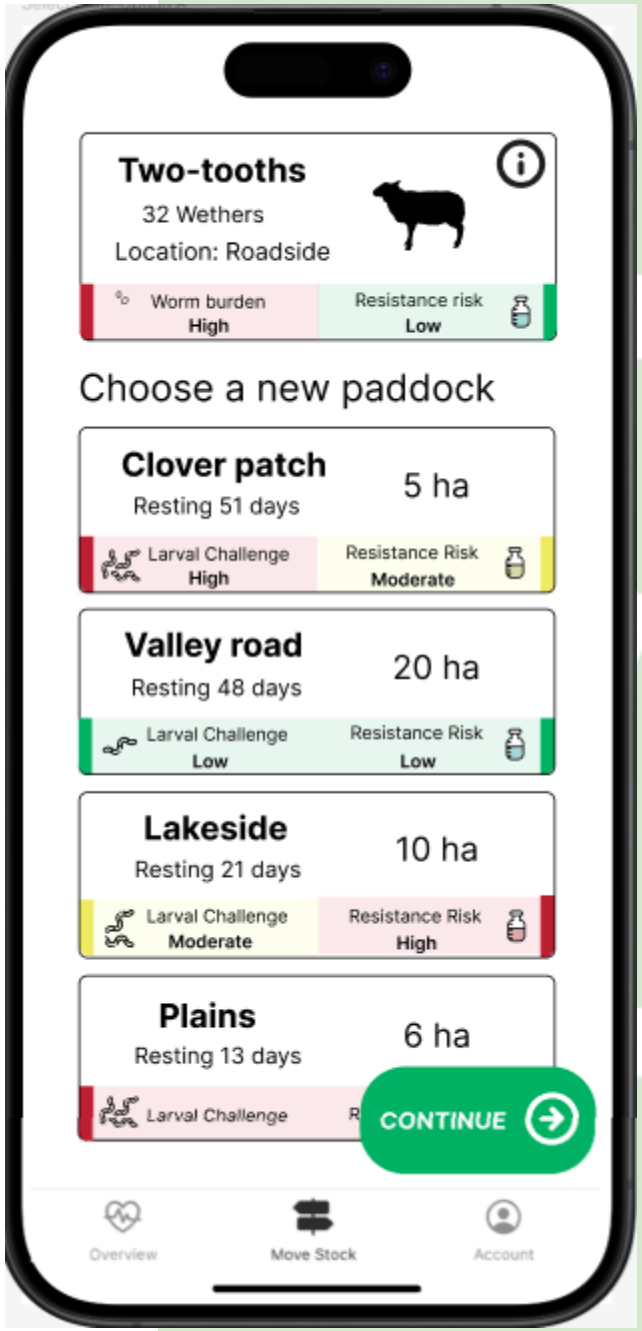
aka proportion of drench exposed larvae or worms

When a farm is first added to DAGI, it begins in a ‘neutral’ state – i.e. all yellow on the traffic light system.

As data is inputted, the app learns the history of the paddocks and mobs and applies the colours accordingly. The more data you input to the app, the more accurate the traffic light system will be.



“Larval Challenge” (on paddock) OR “Worm Burden” (in sheep)



Traffic light system/Heat Maps are ranked WITHIN Farm

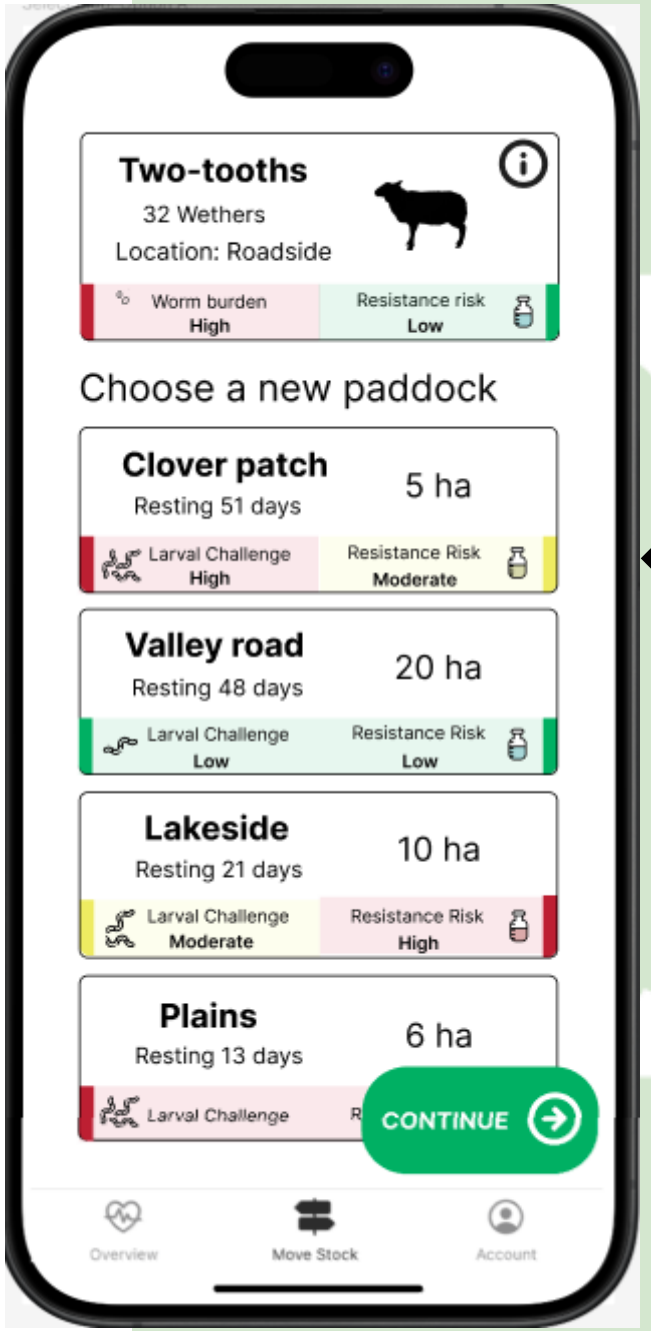
“What’s the best grazing decision you can make on your farm, balancing feed quality and parasite dynamics?”

i.e Lamb ≠ High Larval Challenge (use cattle / older stock instead)

Traffic light system/Heat Maps track the PROPORTION of larval challenge / worm burden that have likely been exposed to drench

“Allows farmers to visualise refugia as a farm and paddock level issue”

…so you can make key decisions on post-drench movement / cropping / use of older undrenched stock etc



“Resistance Risk”
Aka proportion of drench exposed larvae or worms

Review (History Tab)

“Larval Challenge”
OR
“Worm Burden”



Area outlined in blue is pinned to top of the screen so still visible while scrolling through paddocks below.

“Resistance Risk”

aka proportion of drench exposed larvae or worms

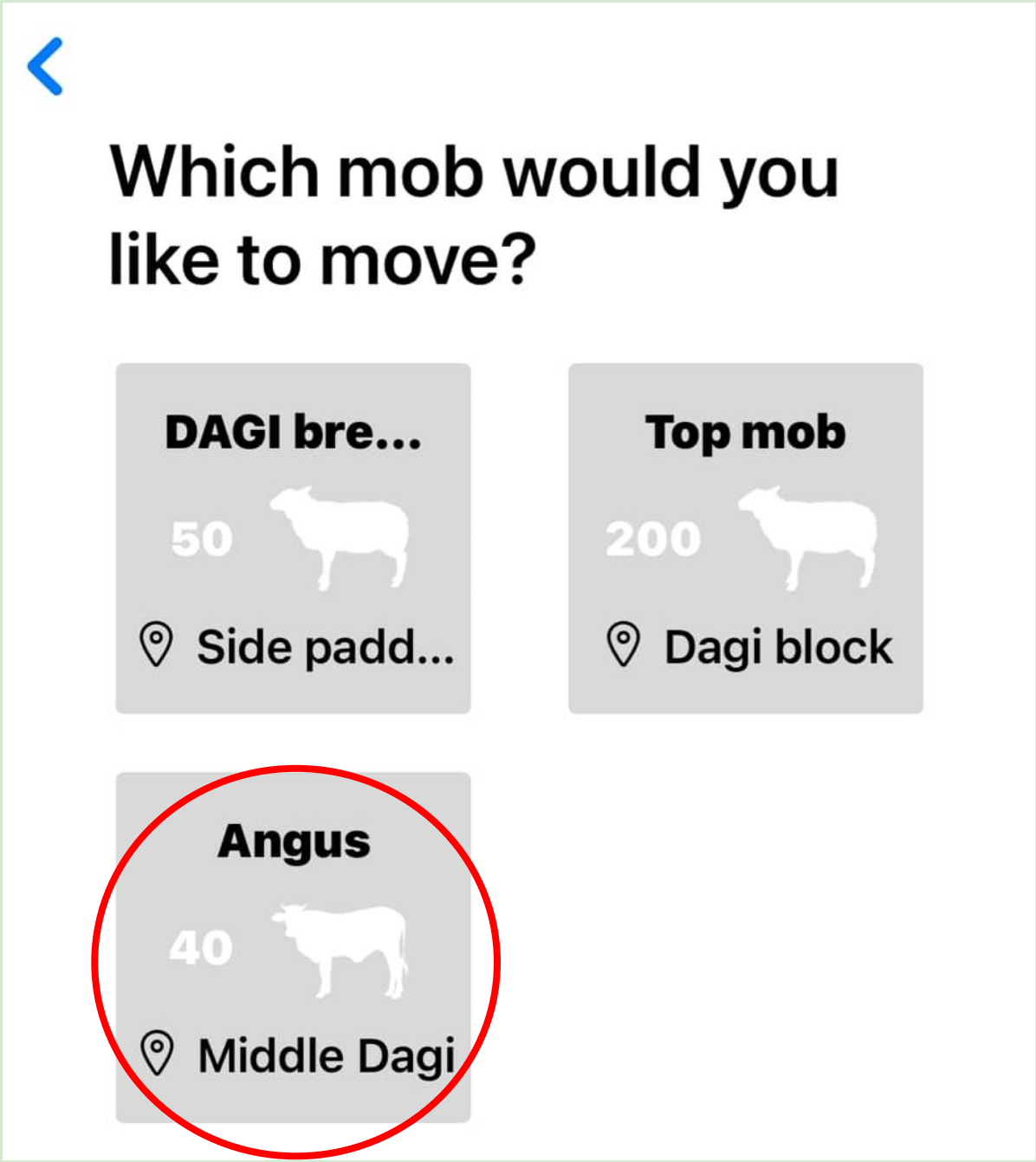
Other aspects of the app

Cattle

can be used as part of "INTEGRATION" – becoming net removers of larvae.

Farmers MUST enter an entry and exit cover for these non sheep mobs.

NOTE: In the app they are a tool for sheep, and the larval/worm risk for them isn't predicted

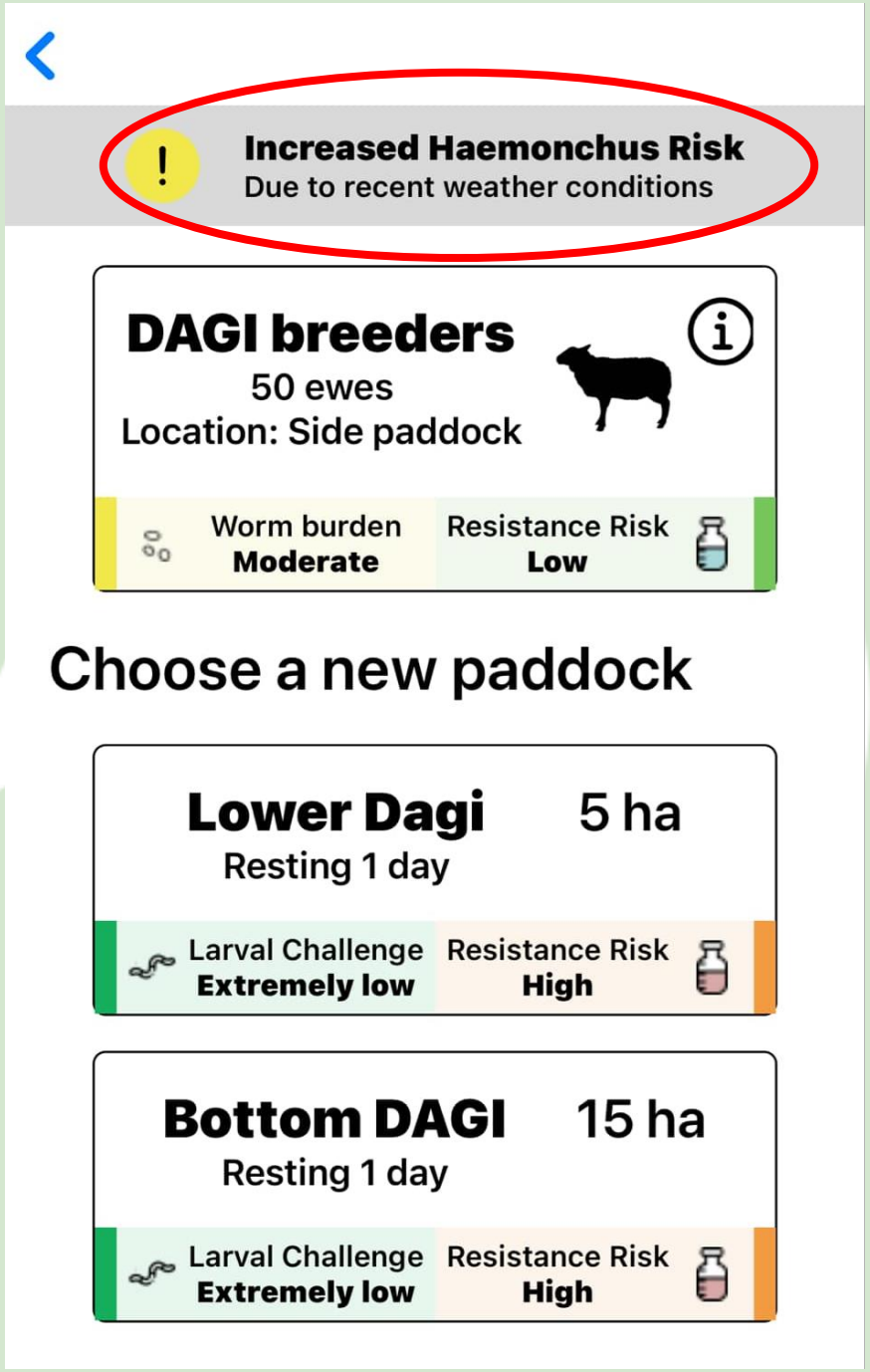


Other aspects of the app

Barber's Pole risk alert

based on expected survival rate (from any eggs laid 22d previously), given your farm's conditions.





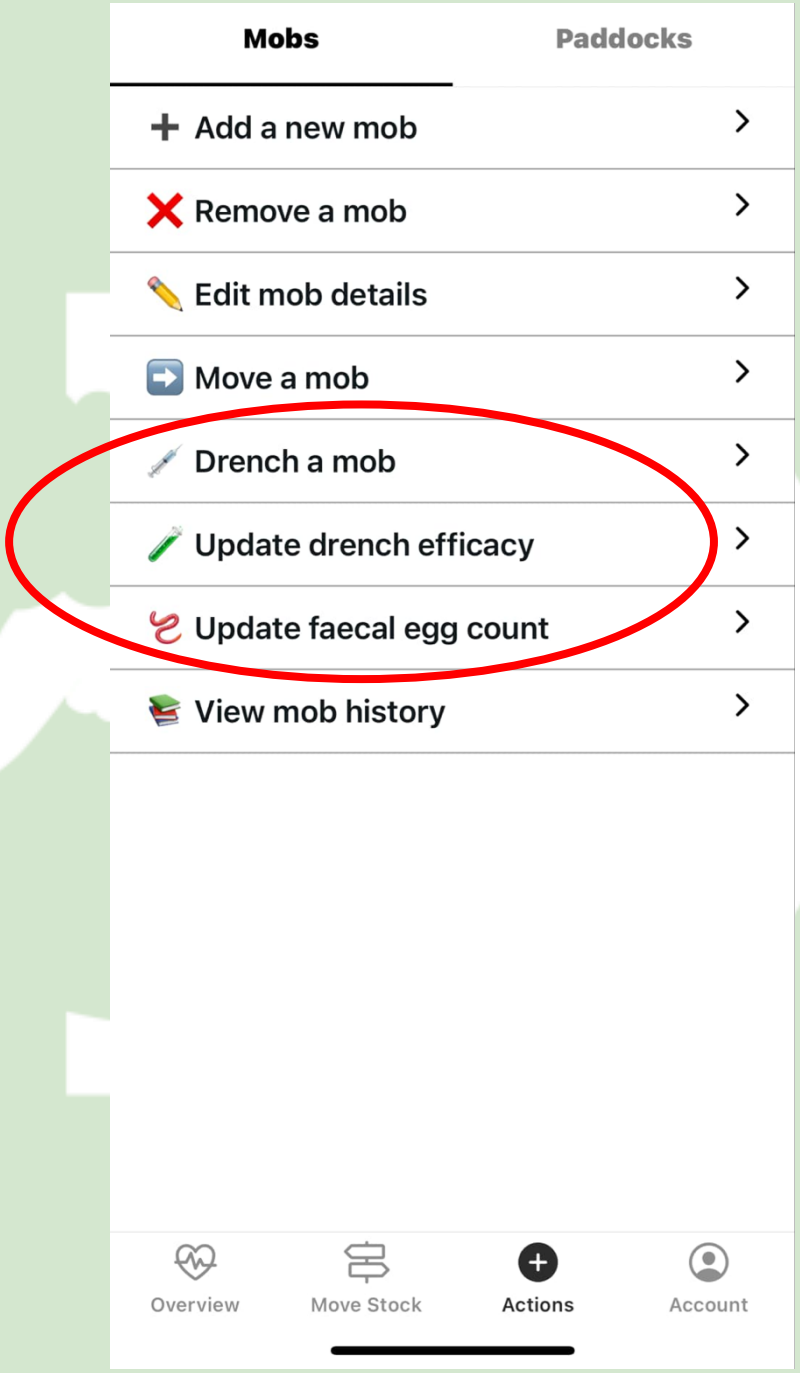
Other aspects of the app

FEC's

RESET the mob contamination level (the more you put in, the more accurate)

Drenching

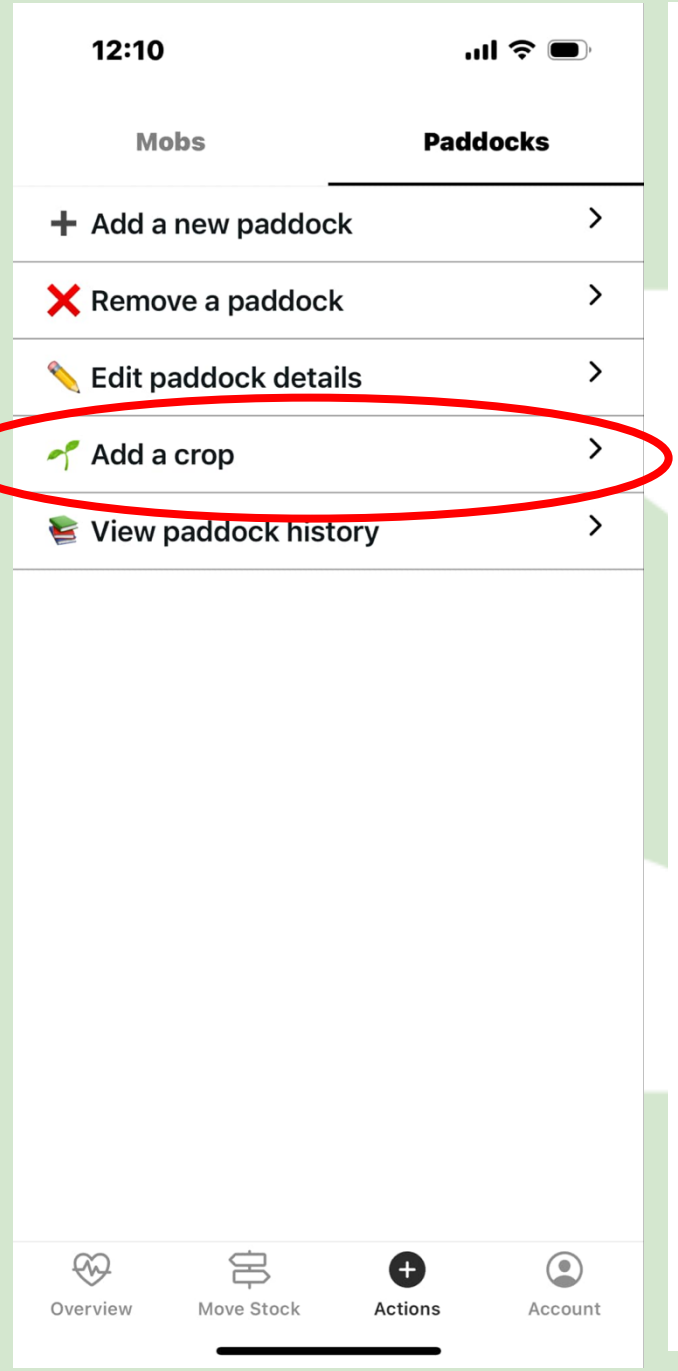
allows for partial mob drenching. Drench efficacies are critical (default values for are 75%, except novels, which is 95% - unless over-ridden)

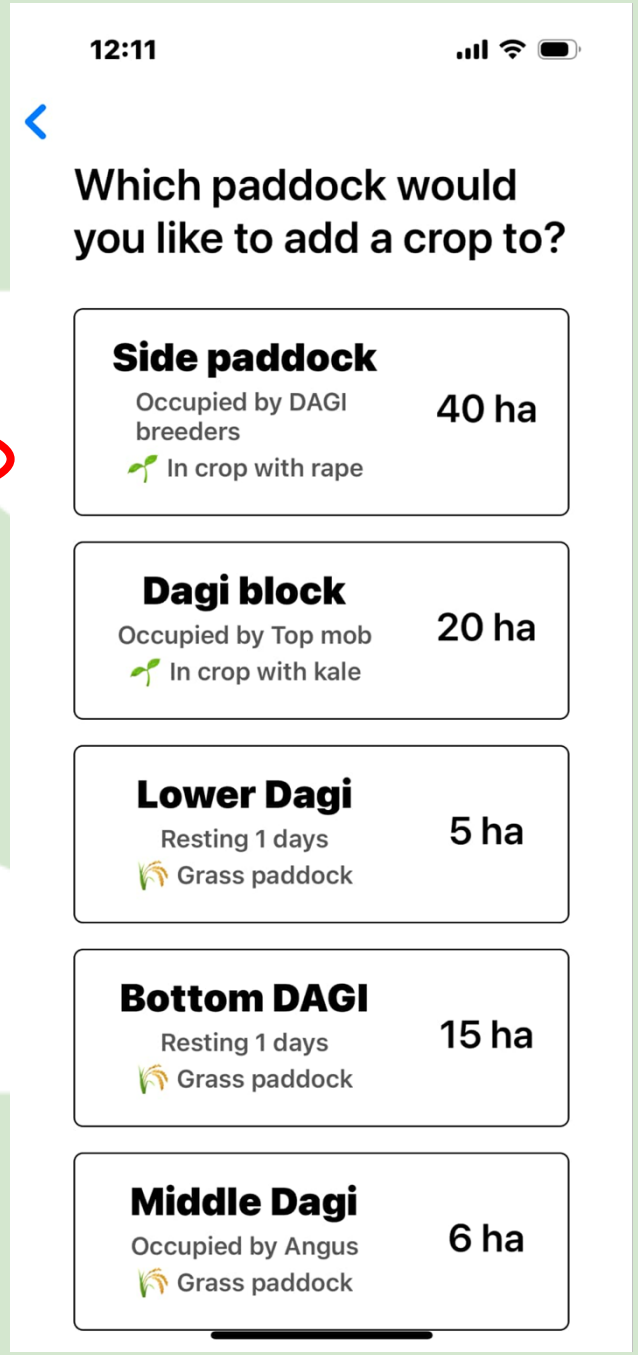


Other aspects of the app

<u>Cropping</u>
effectively resets a paddock.

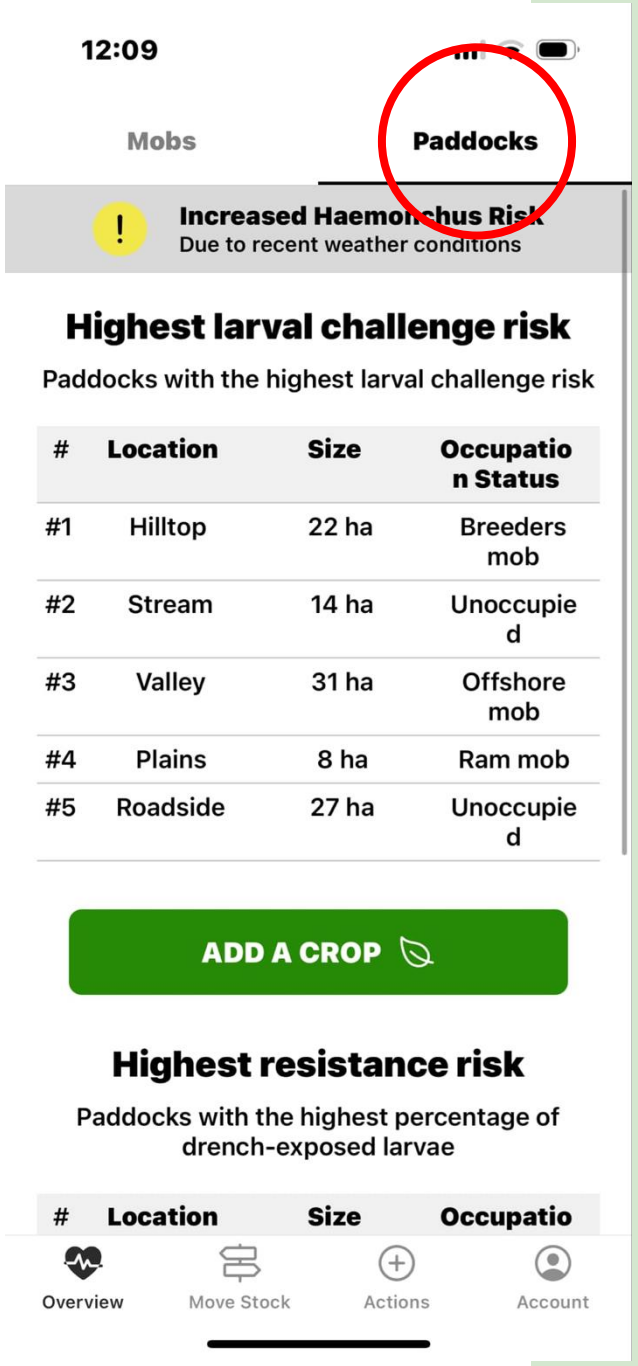
Allows you to set a % of cultivatable land for that paddock – keeps any grass left at the previous paddock contamination level

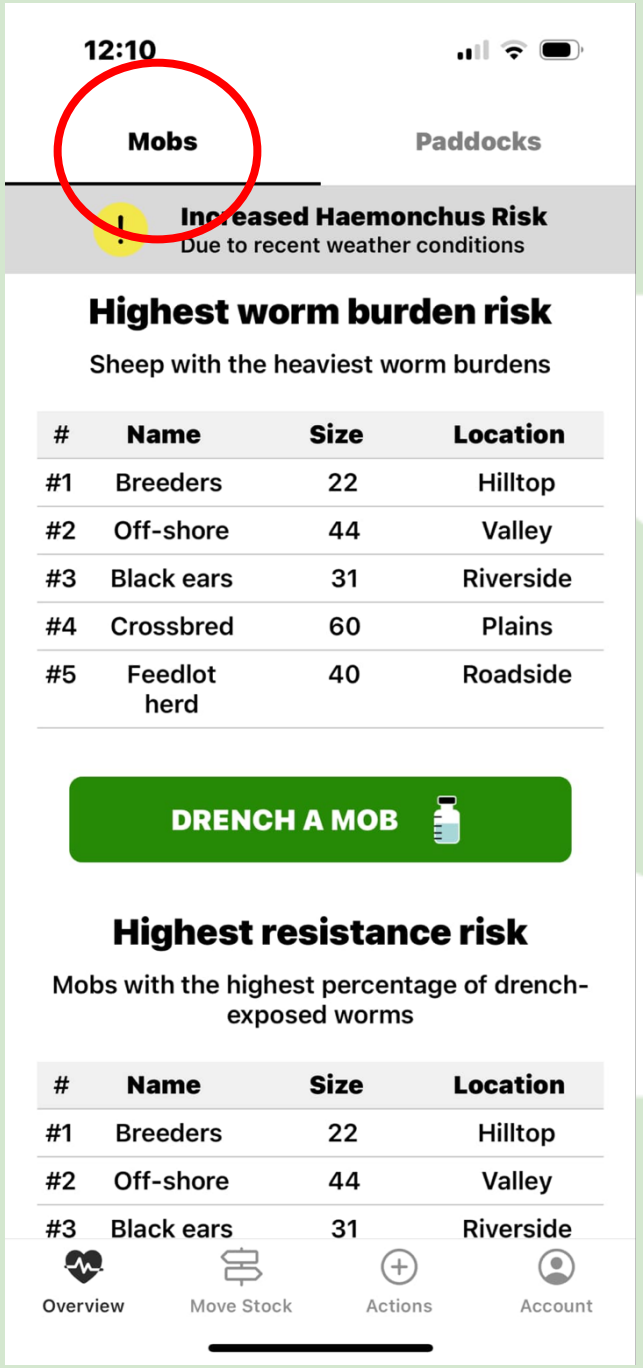


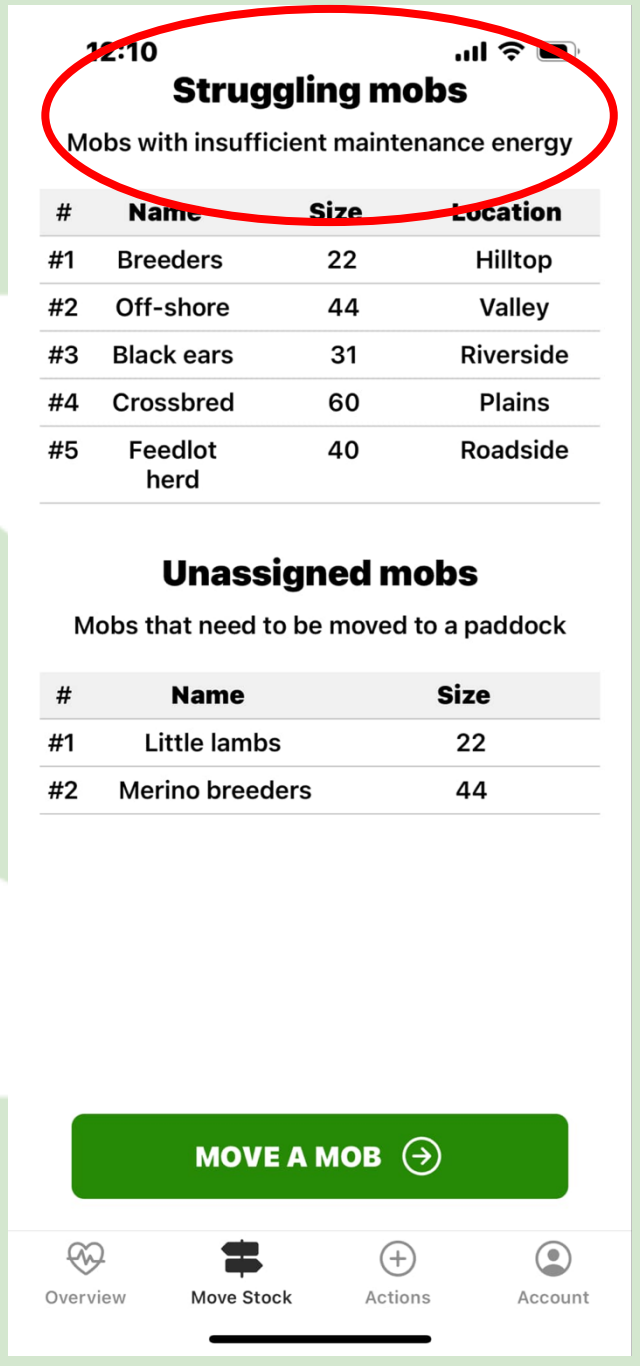


Other aspects of the app

Navigation





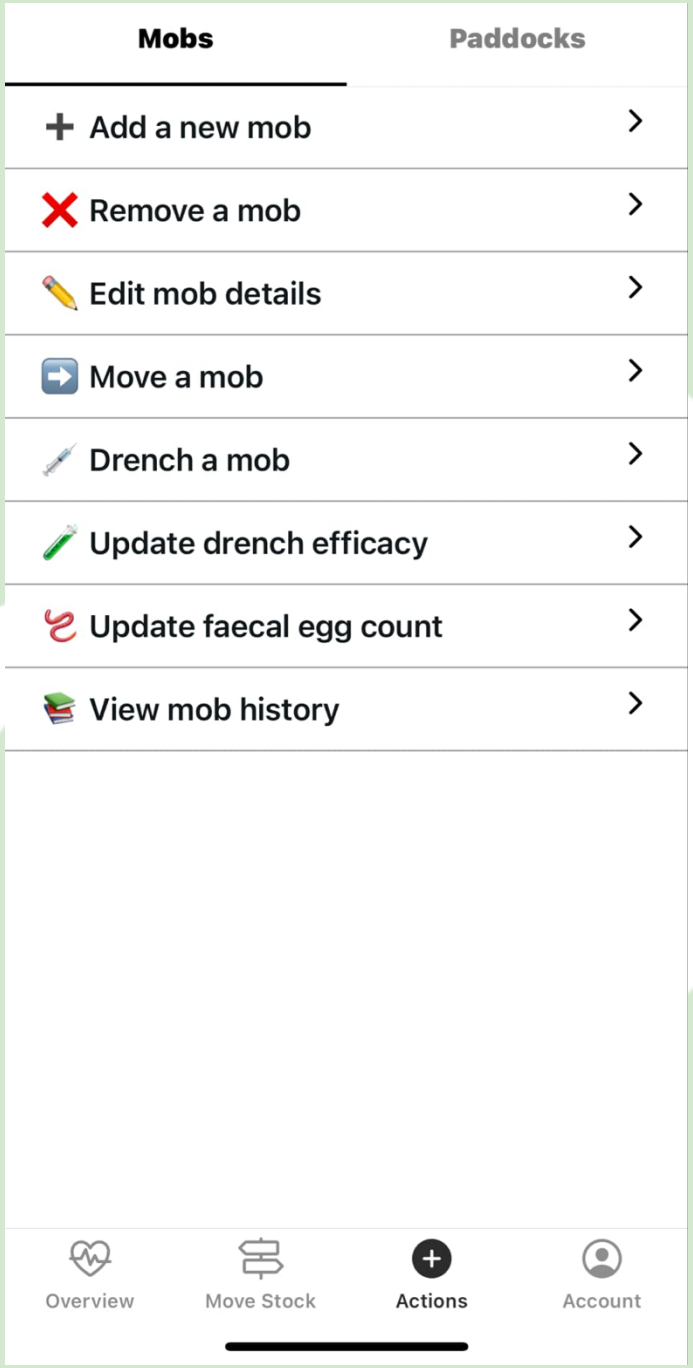


Other aspects of the app

Mob management

From a farming perspective it is designed to allow for:

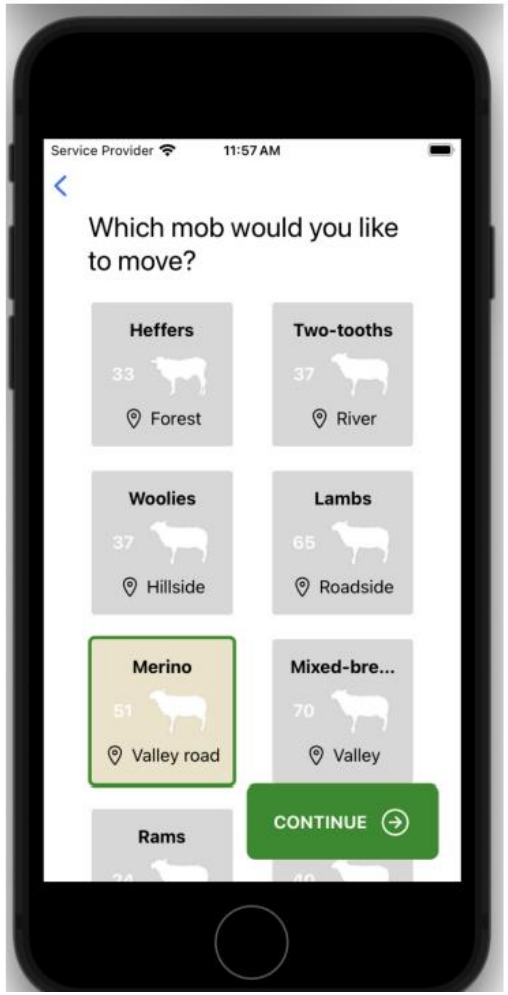
- **Supplementary feeding**
- **Set-stocking**
- **Splitting or merging mobs**
- **Irrigation**
- **Different soil types**



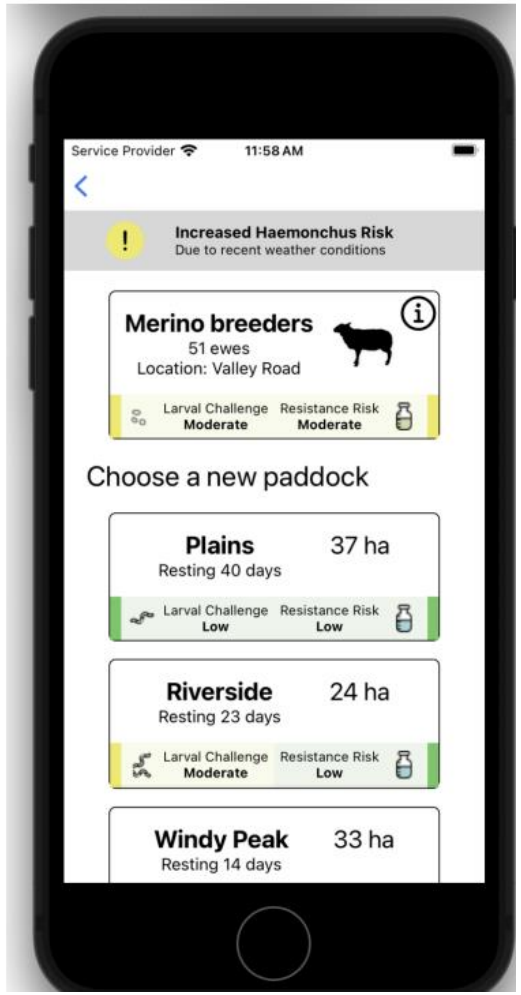
Map Limitations (and integration plans)

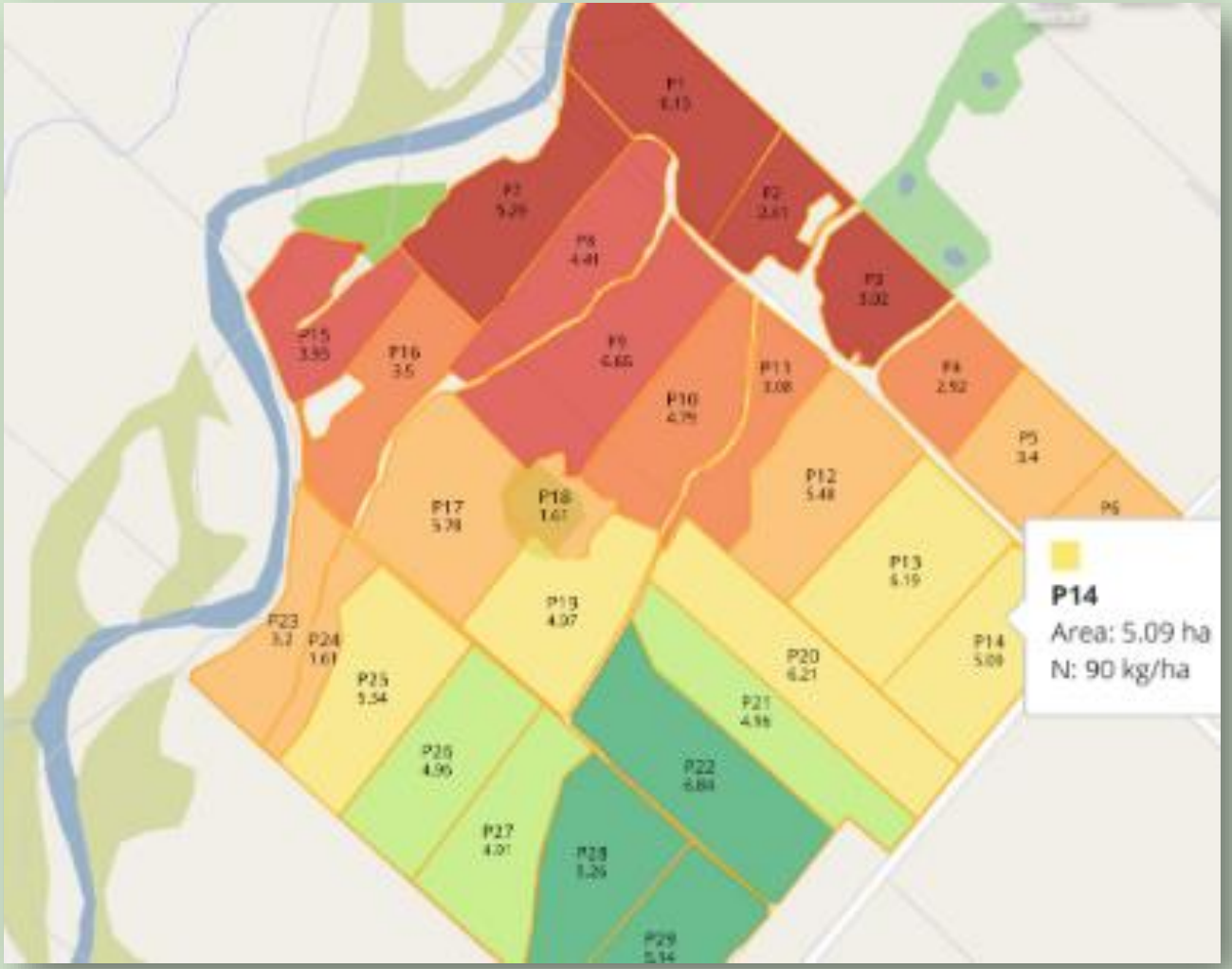
‘Move a Mob’ Flow

Select a mob to move



Select a new paddock





***Not currently able to be built with funding for Beta version**

The role of the vet?



Successful "change adoption" rarely happens in isolation – farmers need a team to support them:

- **Vets in NZ are trained in the Wormwise principles**
- **SQP's (Suitably Qualified Persons) internationally – trained in similar principles**
- **Vets understand farm systems and get to see a range of farmer-led solutions that can be passed on to clients facing similar issues**

https://www.dagi.nz/

We are grateful for support from:

SHEEP AND BEEF CATTLE VETERINARIANS of the NZVA

beef+lamb new zealand

Beef + Lamb New Zealand is a proud funding partner of DAGI