



## LOOMING ISSUES

*Nitrogen Limitations*

*Water Concerns*

*Climate Impacts*

*Labour*

## INTRODUCTION

You're not applying a granule that dissolves, you are installing a network that multiplies.

Respond's tailored living fungi & bacteria mix's bring the durability & energy back to production platform's quickly.

## SOLUTION

Our bacteria turns atmospheric nitrogen into plant ready nitrogen, our fungi stores the excess nitrogen for later use

## SOLUTION

Fungi store water, they can expand to hold 30,000 times their own mass producing healthy fungi networks which are game changers by storing water right under your plants like a dam

## SOLUTION

Healthy soil life banks nitrogen & water providing longer performance in dryer conditions. Less inputs lowers compliance issues & increases future opportunities for added value

## SOLUTION

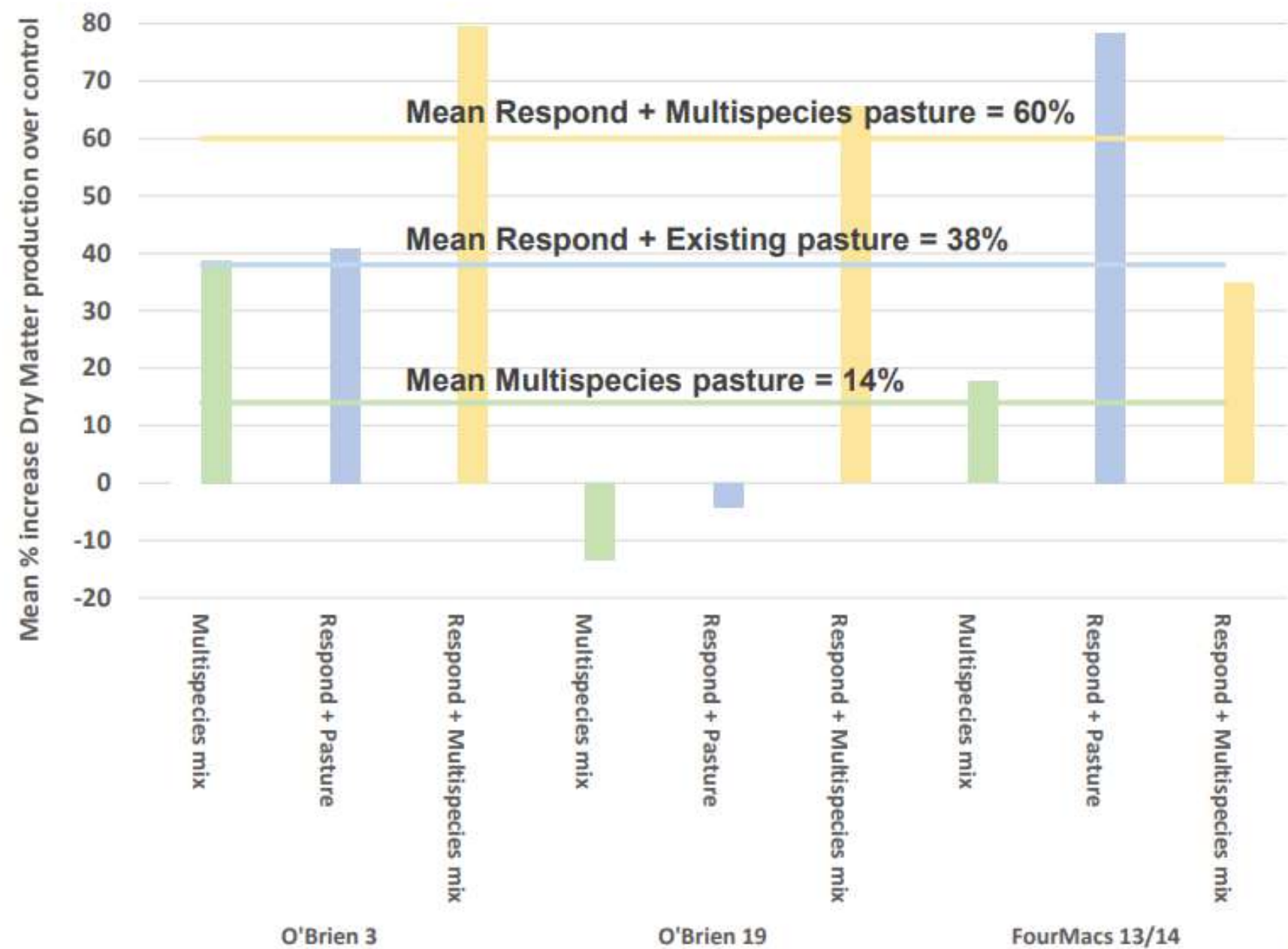
Rising Input and Labour Costs  
After planting the biologics get to work 24/7, making existing nutrients more available and improving soil health.



# LIVE BIOLOGICALS MAKE THE DIFFERENCE

- Together, Respond and multispecies pasture increased DM yield by 60% !
- Respond's biological dairy mix increased existing pasture yield by 38%
- The multispecies cover crop showed a 14% increase in DM production

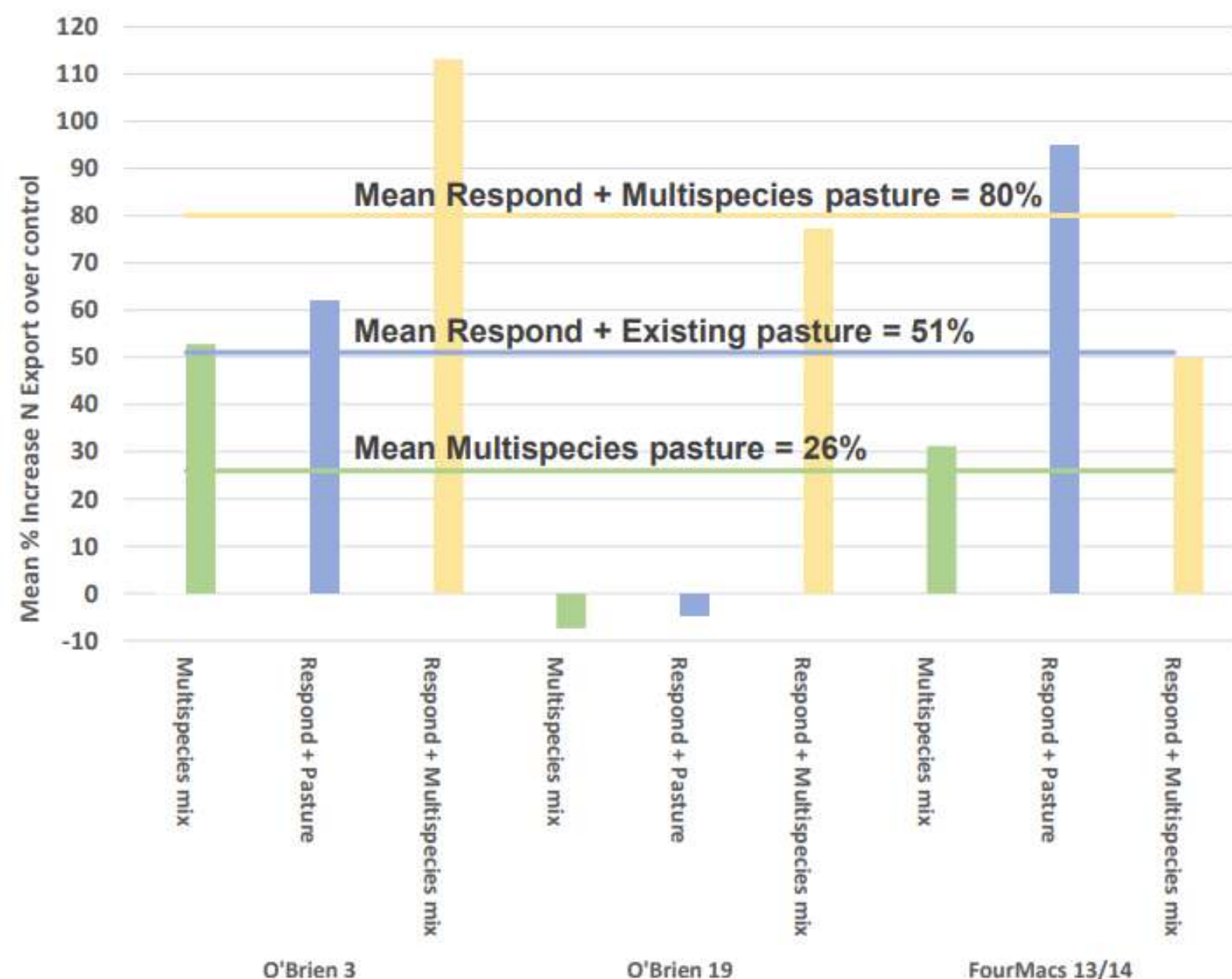
## Trial 2 – 2019/20 Respond ± Multispecies Pasture Increase in Dry Matter production



## Trial 2 – 2019/20 Respond ± Multispecies Pasture Summary of Nitrogen Uptake



- Nitrogen uptake increased for all treatments, up to 80% for the Respond + Multispecies pasture!
- [Only 10 kgN/ha per month being applied, including to control pasture]





# ENHANCED NUTRIENT UPTAKE

## 2.2 Nitrogen Uptake

Figure 2 shows the mean cumulative nitrogen uptake for the February to July 2021 period.

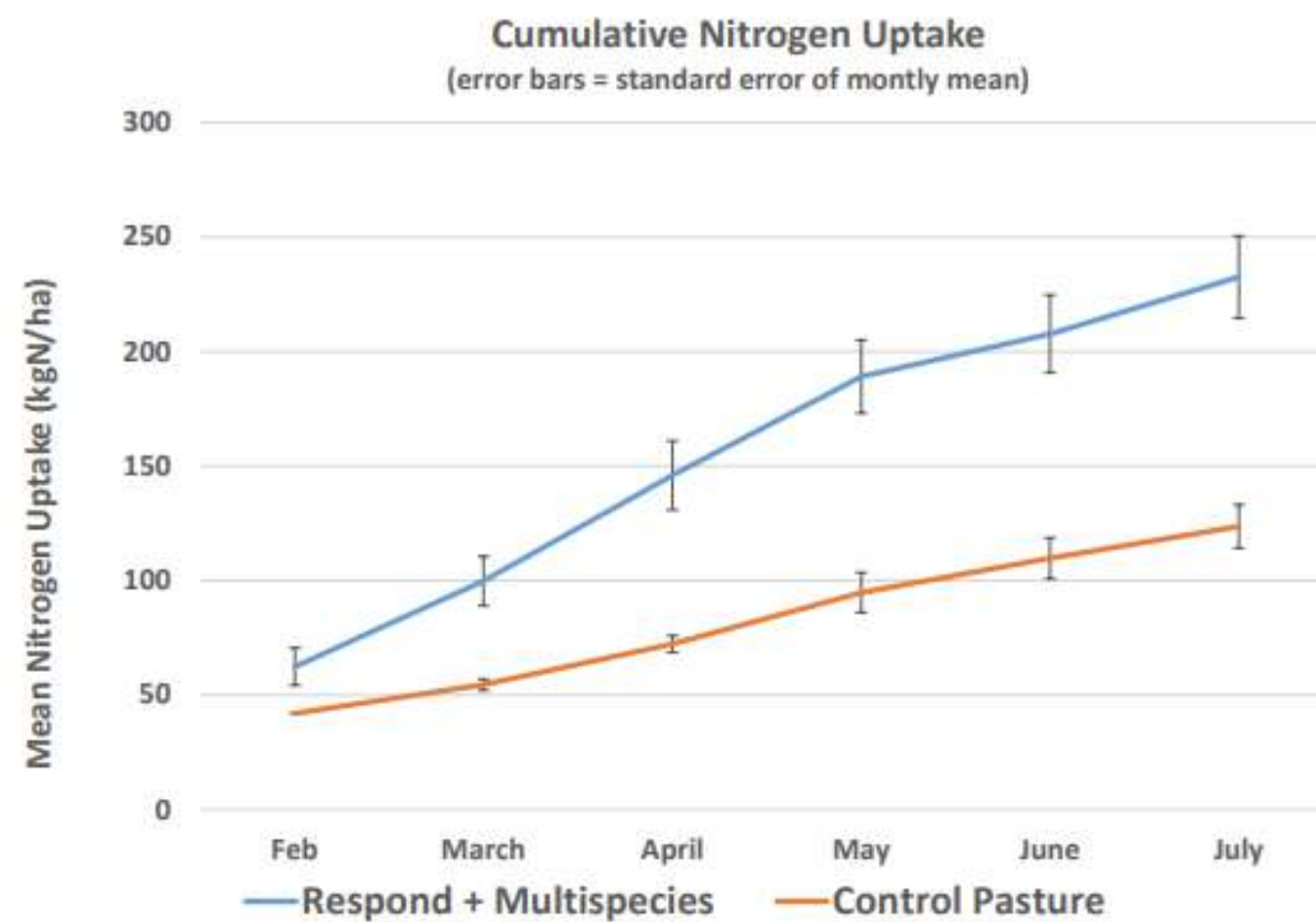


Figure 2. Cumulative nitrogen uptake from the first cut in February 2021 through to July 2021

Mean nitrogen uptake was 62 kgN/ha in February for the Respond + multispecies pasture mix, as compared to 42 kgN/ha for the existing pasture controls. Nitrogen uptake in the treatment plots increased at a greater rate than the controls. By July 2021 a mean of 233 kgN/ha had been removed for the Respond paddocks versus 124 kgN/ha for the controls, an increase of 81%.

The combination of Respond & selected plants drives growth. The live biologics selected in Respond .. nutrient & store them. The plant has more access to the nutrient store & grows more plant matter. Respond digests these nutrients before they can present risk.

## 2.3 Phosphorus Uptake

Phosphorus removals from the paddocks showed a similar pattern to dry matter and nitrogen (Fig. 3). In February, higher DM yields and slightly higher P content in the multispecies mix removed on average 10.4 kgP/ha versus 2 kgP/ha for the pasture controls. By July, the cumulative P uptake by the Respond plus multispecies pasture mix was 35 kgP/ha versus just 14 kgP/ha for the control pastures.

A further benefit of the respond + multispecies mix is its installation via a cross slot drill, therefore any risk of surface run off P losses through exposed soil surfaces ie. ploughing is minimised. Additionally the perennial nature of most species within in the multispecies mix means replenishment should only be required every 6-7 years.

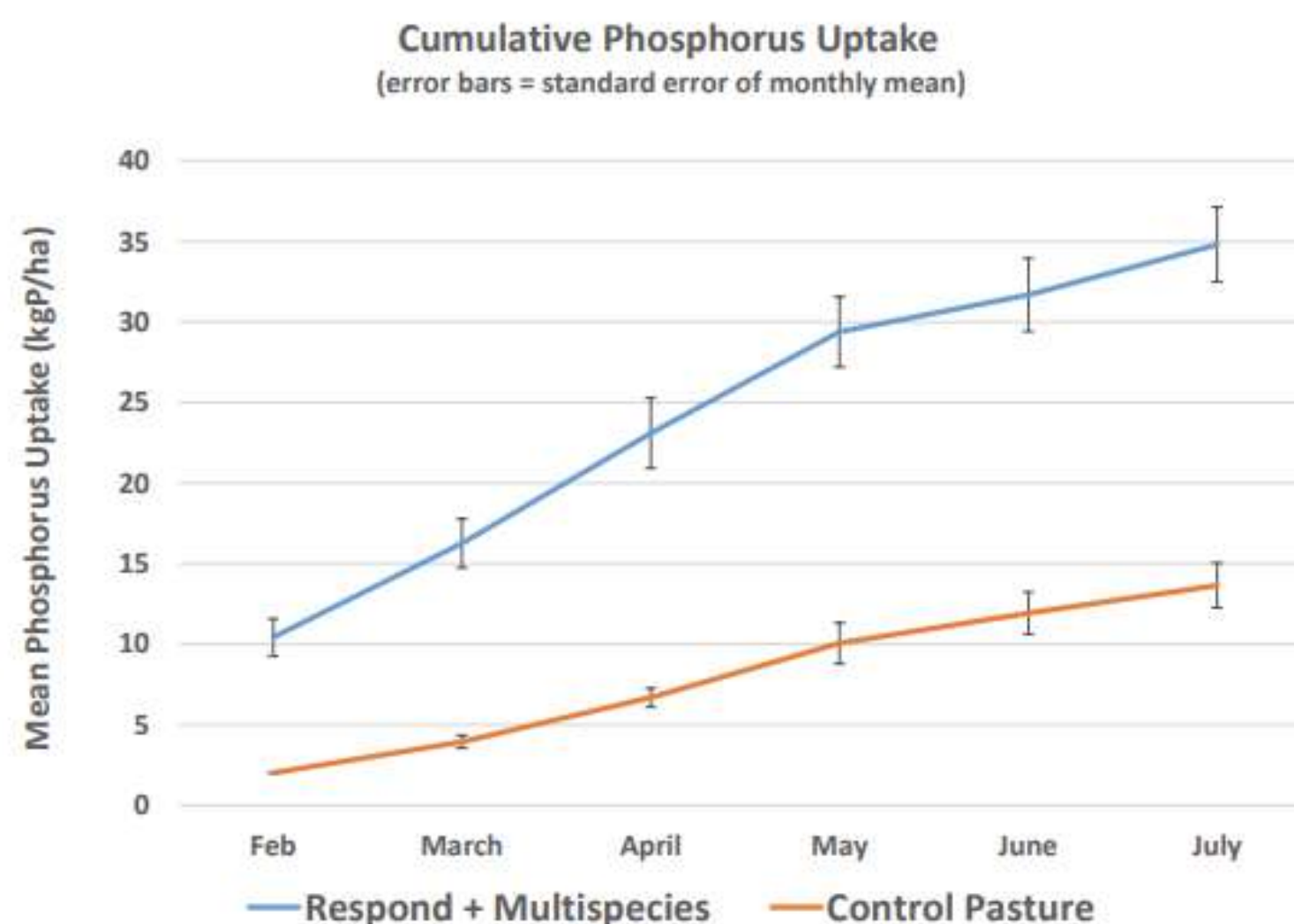


Figure 3. Cumulative phosphorus uptake from the first cut in February 2021 through to July 2021





# HOW WE DO IT!

## Below ground soil life improvement

Control Pasture

Treated Pasture

Assay Name	Result	Units	Range	Commentary
<b>Organism Biomass Data</b>				
Dry Weights	0.67	N/A	0.45 to 0.85	Within normal moisture levels. Indicates organic matter at good levels. However this needs to come in contact with active soil microbes to be converted to valuable humus. This will help with creation of soil structure and improve nutrient retention.
Active Fungi	9.42	µ/g	> 75	Fungal activity low for spring seasonal growth. Soil's fungal food resources probably low.
Total Fungi	147.79	µ/g	> 300	Total fungal biomass very low. This will have a negative effect on the creation of soil structure and disease suppression. - What fungi exists shows reasonable levels of diversity with adequate fungal hyphal formations.
Hyphal Diameter	3.00	µm	> 2.5	
Active Bacteria	31.59	µ/g	> 75	Bacterial activity low for spring seasonal growth. Soils Bacterial food resources probably low.
Total Bacteria	295.99	µ/g	> 300	Total Bacterial biomass as low end of desired range.
Actinobacteria	0.00	µ/g	< 20	
<b>Organism Biomass Ratios</b>				
TF:TB	0.50		0.85 to 1.45	Too bacterial dominated for healthy pasture production.
AF:TF	0.06		> 0.25	The overall percentage of active fungal biomass is low.
AB:TB	0.11		> 0.25	The overall percentage of bacterial activity is also low.
AF:AB	0.30		1 to 2	Bacterial dominated soil, becoming more bacterial with time. Not desirable in this instance.
<b>Protozoa (Protists)</b>				
Flagellates	68379.28	#/g	> 10000	Good flagellate numbers but amoebae low. Lacking species diversity. Some nutrient cycling taking place by the actions of these bacterial-eating predators.
Amoebae	2263.97	#/g	> 10000	
Ciliates	63.84	#/g	< 706	
Nitrogen Cycling Potential	112-168	kg/ha		Nitrogen levels dependent on plant needs. Estimated availability over a 3 month period.

Assay Name	Result	Units	Range	Commentary
<b>Organism Biomass Data</b>				
Dry Weights	0.65	N/A	0.45 to 0.85	Within normal moisture levels indicating organic matter at reasonable levels, however organic matter must come in contact with active microbes to be converted into valuable, stable humus.
Active Fungi	13.18	µ/g	> 40	Fungal activity low. Soil's fungal food resources probably too low. Additions of fungal foods with other inputs should help to lift levels ie good quality humates, fish hydrolysate etc.
Total Fungi	426.55	µ/g	> 300	Total fungal biomass in good range - Fungal diversity appears at good levels with some healthy looking hyphal formations. Quite a few groups a little 'tatty' looking. Some damaged and no longer viable groups also evident.
Hyphal Diameter	3.00	µm	> 2.5	
Active Bacteria	40.96	µ/g	> 40	Bacterial activity within normal levels for pasture.
Total Bacteria	389.68	µ/g	> 300	Good total bacterial biomass. Indicates good diversity.
Actinobacteria	0.00	µ/g	< 20	
<b>Organism Biomass Ratios</b>				
TF:TB	1.09		0.85 to 1.5	Correctly balanced fungal and bacterial biomass for Pasture production.
AF:TF	0.03		> 0.15	The overall percentage of active fungal biomass is too low.
AB:TB	0.11		> 0.15	The overall percentage of active bacteria is too low
AF:AB	0.32		0.85 to 1.5	Fungal dominated soil, becoming more bacterial with time.
<b>Protozoa (Protists)</b>				
Flagellates	Processing	#/g	> 5000	
Amoebae	Processing	#/g	> 5000	
Ciliates	Processing	#/g	< NaN	
Nitrogen Cycling Potential	Processing	kg/ha		Nitrogen levels dependent on plant needs. Estimated availability over a 3 month period.

## Above ground production results



	Control	Respond
<b>Kg maximum intake for animal of 50kgs (sheep)</b>	4.2kg	7.2kg
<b>Kg maximum intake for an animal of 500kg (Cattle)</b>	50	86
<b>Metabolisable energy (ME)</b>	11.9	11.3
<b>Relative Feed Value</b>	92	142

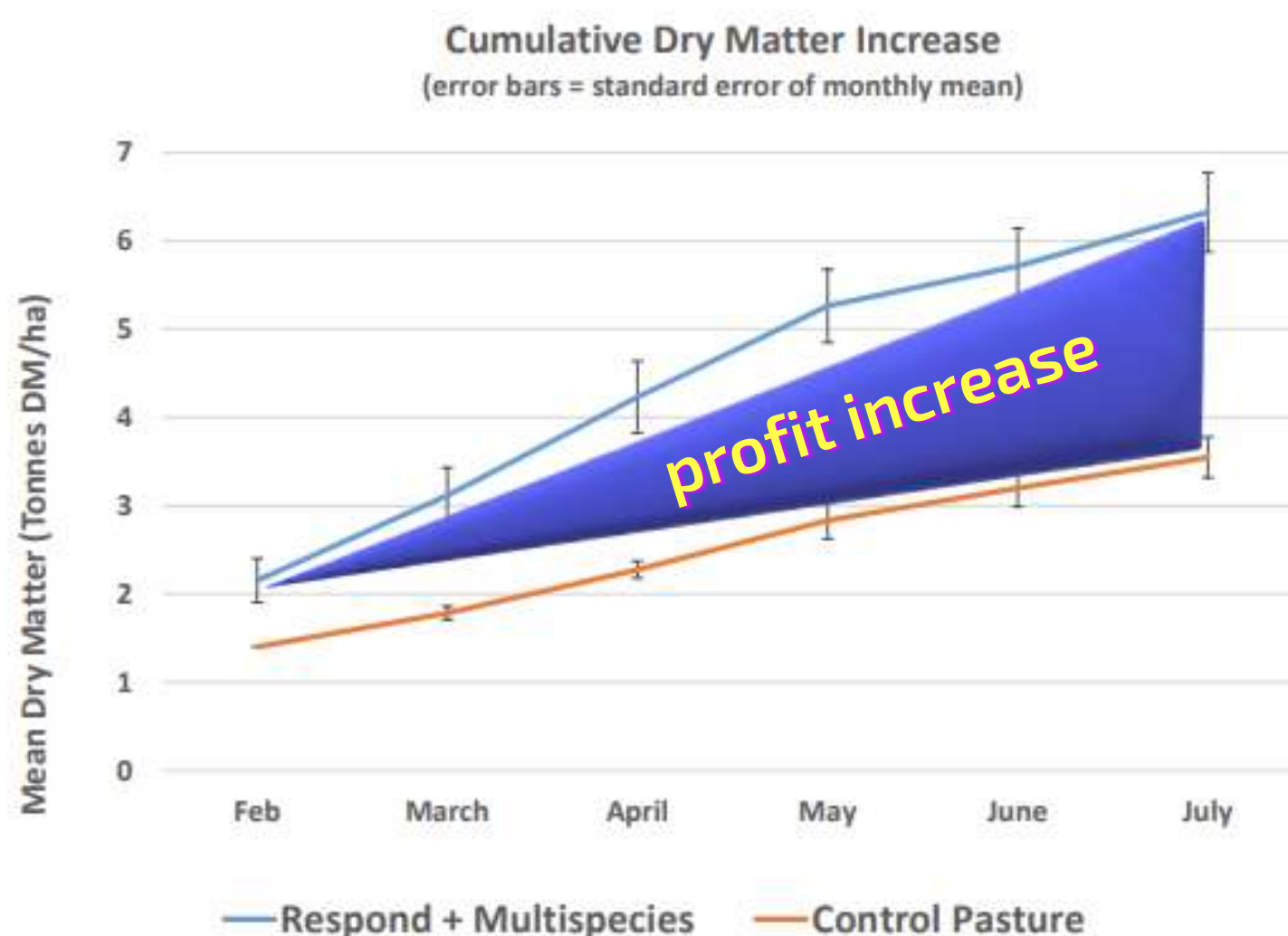


Figure 1. Cumulative dry matter yield from the first cut in February 2021 through to July 2021

