

MultiMilk: Evaluation of Low N Dairy Systems 2021-2025 Multi-species swards: the experience at Curtin's Farm to date

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#### **Context for Multi-Milk Project focus**

#### **Water Framework Directive**

- At least good ecological status in all water bodies (2027)
- 57% of rivers presently have good ecological status

### EU Farm to Fork

50% reduction in nutrient losses by 2030

### **Climate Action Plan 2021**

- To reduce agricultural emissions by 22-30% by 2030
- #298 & #300 reduce chemical N by 25% by 2030
- #302 Promote use of leguminous crops to fix N



# What are benefits of increased sward diversity?

Diversity/

complexity

- Increased pasture yield stability (Finn et al., 2018, Grange et al., 2021)
- Increased intake & performance (Dineen et al., 2018; McCarthy et al., 2020) Increased intake
- Reduced N requirement (Lüscher et al., 2014; Dineen et al., 2018)
- Improved milk character (O'Callaghan et al., 2016; Pouteraud et al., 2018)<sub>Red clover</sub>
- Reduced N leaching, NH<sub>4</sub> & N<sub>2</sub>0 emissions (Cummins et al., 2021)
- Improved C sequestration (Buzhdygan et al. 2020)
- Improved rumen digestion (Pembleton et al., 2016)
- Enhanced biodiversity (Fox et al., 2020)

2020 Timothy M. Fescue 018) Red clover Hybrid clover Plantain Chicory

PRG + WC

PRG + WC Timothy **M.** Fescue Cocksfoot Tall Fescue Lucerne **Red clover** Hybrid clover Sweet clover Plantain Chicory Sainfoin Birdsfoot Trefoil Yarrow Burnet **Sheeps Parsley** 

Productivity/+Nutrient use / +Climate stress/ +Pollinators/ +Pest resistance

PRG

### **Our Research Question**

What are the impacts of increasing sward diversity on pasture and animal performance, product character and environmental outcomes within low N input multiyear grazing systems?

Treatments - 3 sward systems 1:PRG 2: PRG – WC 3: MSS					
Species					
Hi PPI PRGx2	35	26.3	11		
Timothy			2		
Meadow fescue			4		
White clover		3.8	3		
Red clover			0.6		
Hybrid clover			3		
Chicory			0.4		
Plantain			1		

Target (G:C:H)100:0:075:25:055:30:15

## **Treatments – Decision rules**

# 3 sward systems evaluated

### 1:PRG 2: PRG – WC 3: MSS

Species			
Chemical N (kg/ha)	250	125	125
Rotation length (d)	23-24	23-24	23-24
Grazing intensity (mm)	40	40	40
Stocking rate (cows/ha)	2.7	2.7	2.7
Concentrate (kg DM/cow)	300-400	300-400	300-400

### **Preliminary Milk Production Results- November 2021**

Sward	PRG	PRWC	MSS
Milk solids (kg/cow)	506	502	517
Milk yield (kg/cow)	5,510	5,319	5,555
Milk composition			
Fat	5.37	5.61	5.43
Protein	3.72	3.73	3.79
Pasture grown (t DM/ha)	12.2	12.1	12.7
Concentrate (kg DM/cow)	282	282	282
Silage (kg DM/cow)	106	105	133
Fertiliser Nitrogen (kg/ha)	235	128	129

### **Preliminary Conclusions...**

- Similar high levels of animal performance achieved to date
- No impact on pasture productivity with 100 kg reduction in Chemical N
- Substantial sward & seasonal variation in botanical composition
- Significant impacts on milk constituents and character



