Multi-Species Swards for Beef & Sheep

A European Innovation Partnership (EIP) Project

Opportunities of Multi-Species Swards
Farm Walk

Dale Orr, Strangford, County Down

Wednesday 1st September 2021

Project co-funded by the European Agricultural Fund for Rural Development and the Department of Agriculture, Environment and Rural Affairs.

Event Information

- Please stay in your allocated group
- A one-way system is in place - AgriSearch staff will accompany each group to their next 'stop'
- Please maintain social distancing where possible
- Hand sanitiser has been provided for your use
- Please ask any AgriSearch or AFBI staff member if you have any queries
- Event handbook will be made available online following the event
- Refreshments available at the end of the Farm Walk
- Please fill in the feedback form to guide future events
- Follow AgriSearch on Social Media for further project updates

Opportunities of Multi-Species Swards

Multi-species Swards for Beef and Sheep

European Innovation Partnership Group

Start: November 2020

End: June 2023

Funding: EIP-Agri

- Jointly funded by the European Agricultural Fund for Rural Development and DAERA
- Designed to bring farmers, researchers and advisors together
- Help NI farmers innovate and address specific opportunities and challenges

Group Membership:

- Dale Orr, Strangford
- Andrew Clarke (W. Acheson), Cookstown
- Crosby Cleland, Saintfield
- Paul Turley, Downpatrick
- Roger Bell, Kells
- Sam Chesney, Kircubbin
- AFBI
- QUB
- AgriSearch (Lead)

Multi-species Swards for Beef and Sheep
European Innovation Partnership Group

Project Aims:

- to investigate the feasibility and practicality of incorporating multi-species swards on NI commercial beef and sheep farms
- to significantly increase the knowledge of MSS establishment, management and use specific to Northern Ireland
- to assess impact of MSS incorporation on animal performance and wider environment
- determine prospects for success of widespread MSS incorporation on NI commercial farms
- share all project activity and results

Opportunities of Multi-Species Swards

Multi-species Swards for Beef and Sheep
European Innovation Partnership Group

Activity to date:

- Soil sampling
- Species mix selection
- Literature review
- Establishment on farm
- Group Discussion
- Farm Walk

Upcoming Activity:

- Manage and Monitor

Multi species swards – what does the science say?

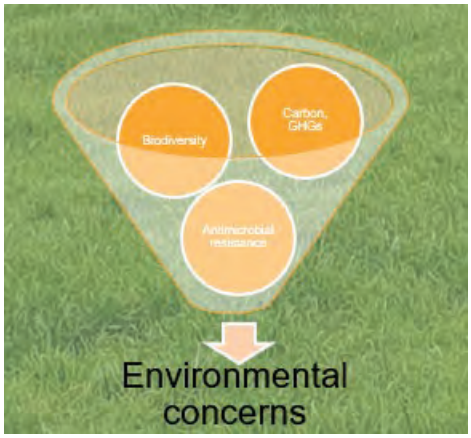
Dr Denise Lowe

Opportunities of Multi-Species Swards

Challenges

NI beef and sheep systems largely grass-based:

- Potential to be high yielding and high nutritive value
- However…reliant on artificial fertilisers



Do multi-species swards present opportunities to address these challenges?

What is a multi-species sward (MSS)?

Opportunities of Multi-Species Swards

Potential opportunities of Multi-Species Swards

- increased productivity
- reduced need for fertiliser N
- more resilient under extremes of weather
- opportunities to extend the grazing season
- improved availability of micronutrients
- improved soil quality & carbon sequestration
- reduced parasite burden
- enhanced biodiversity above & below ground

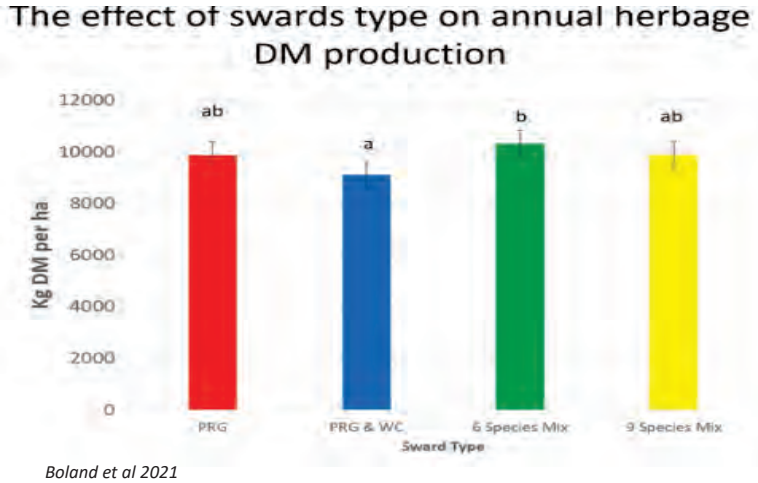
Features of each species

Using TOMS Sward App

	Cocksfoot	Timothy	Chicory	Plantain	Alsike clover	Birds foot trefoil	Red clover	Sainfoin	White clover
Protein									
Minerals		?			?			?	
Persistence (grazing)					?				
Relative yield (grazed)					?			?	
Anthelmintic properties					?		?		
Waterlogging tolerance			?		?				
Marginal soils tolerance			?						
Drought tolerance									

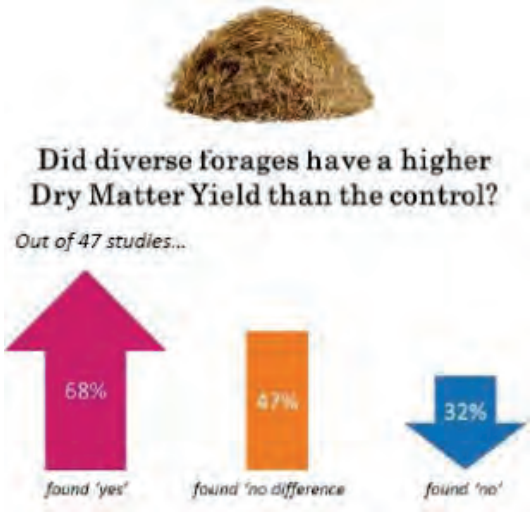
Opportunities of Multi-Species Swards

Biomass Production



Boland et al 2021

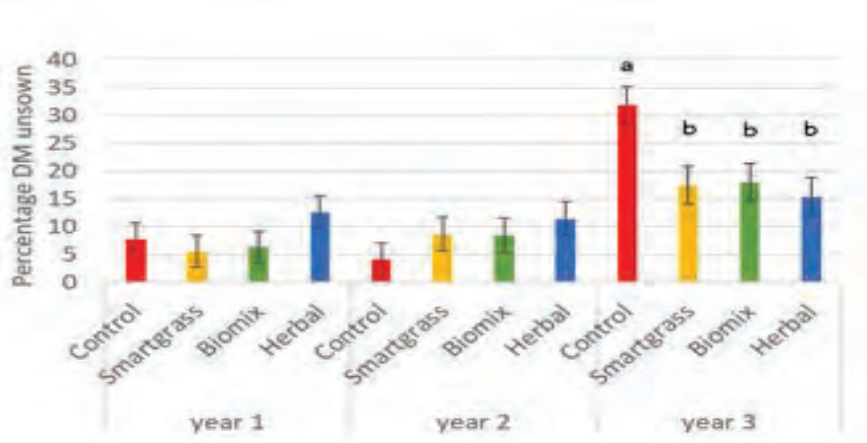
- Recent research in Ireland (Grange *et al* 2021) showed MSS produced similar yields under drought conditions to PRG given double the artificial N under rainfed conditions



D Beamont, Duchy College, TOMS project (Toolbox of multi species swards)
https://www.agricology.co.uk/resources/herbal-leys-virtual-field-day-parts-1-2

Weed Burden

The Diverse Forage Project-Unsown species



Barker *et al* 2021

Opportunities of Multi-Species Swards

Persistence of MSS

Sward type[1]	PRG	PRGWC	6S	9S	SEM	*P*-value
Year 1						
Grass	0.96[a]	0.88[b]	0.68[c]	0.68[c]	0.044	<0.05
Legume	0.01[a]	0.10[b]	0.15[b]	0.14[b]	0.018	<0.05
Herb	0.03[a]	0.02[a]	0.17[b]	0.18[b]	0.035	<0.05
Year 2						
Grass	0.99[a]	0.90[b]	0.77[c]	0.84[b]	0.045	<0.05
Legume	0.00[a]	0.09[b]	0.16[b]	0.10[b]	0.025	<0.05
Herb	0.01[a]	0.00[a]	0.07[b]	0.06[b]	0.035	<0.05

[a,b,c]Within rows, means with differing superscripts differ significantly.
[1]PRG = perennial ryegrass only; PRGWC = perennial ryegrass and white clover; 6S = 6 species (perennial ryegrass, timothy, white clover, red clover, plantain and chicory); 9S = 9 species (perennial ryegrass, timothy, cocksfoot, white clover, red clover, birdsfoot trefoil, plantain, chicory and yarrow).

Grace *et al* (2019)

In a 2 year sheep grazing study:

	6S	9S
grass	+9%	+16%
legume	+1%	-4%
herb	-10%	-12%

Sward Management – Welsh EIP Project Outcomes

- Rotational grazing is preferred to continuous to prevent plants from being grazed out.
- Late autumn grazing and under-grazing in spring may have contributed to the decline in diversity.
- Winter rest period is important to allow the legumes and herbs to persist.
- A single silage cut (mid-season) seems to have no detrimental effect on the ley.
- Moderate N applications (<150kgN/ha) did not have an adverse effect.

Opportunities of Multi-Species Swards

Effect of sward type on lamb weights (kg), daily gains (g/d) and carcass traits

	Sward type[1]					
	PRG	PRGWC	6S	9S	SEM	*P*-value
ADG from birth to slaughter	222[a]	239[b]	242[b]	244[b]	6.6	<0.05
ADG from weaning to slaughter	183	192	193	193	8.0	NS
Days to target slaughter weight[2]	181[a]	167[b]	168[b]	168[b]	3.7	<0.001
Slaughter weight, kg	45.9[a]	46.3[b]	45.9[a]	45.8[a]	0.15	<0.01
Carcass weight, kg	20.4[a]	20.6[b]	20.4[a]	20.4[a]	0.08	<0.05
Carcass conformation	3.35[a]	3.47[ab]	3.55[b]	3.41[ab]	0.069	<0.01
Carcass fat	2.9	3.1	3.1	3.0	0.07	NS
Carcass kill out, %	44.0[a]	44.4[ab]	44.8[b]	43.7[a]	0.38	<0.05

[a,b]Within rows, means with differing superscripts differ significantly.
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Grace *et al* 2019

Animal Health - Minerals

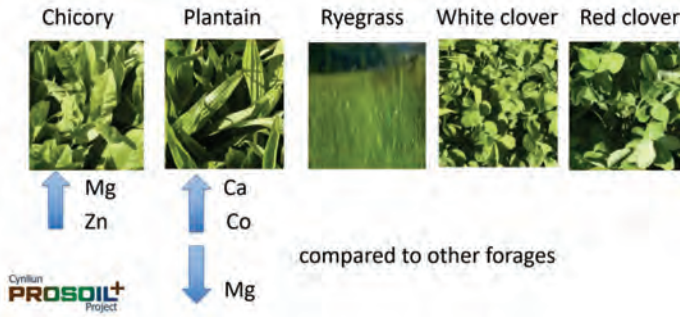

Chicory


Plantain

Evidence of differences between grasses/ legumes/herbs:

- Darch *et al* (2020) showed herbs were highest in I and Se, grasses in Mn and legumes in Cu, Co, Zn and Fe
- Marley *et al* (2021) found that chicory had higher Ca and Cu and plantain had higher Cu and I than PRG.

Also:



The effect on mineral content of meat needs further research

Opportunities of Multi-Species Swards

Animal Health – Anthelmintic Properties

- The effect of sward type on faecal egg count (FEC) at 12 weeks old, the days between anthelmintic treatments and the total number of anthelmintic treatments administered to lambs (Grace *et al*, 2019)

	Sward type[1]					
	PRG	PRGWC	6S	9S	SEM	*P*-value
Week 12 FEC, epg[2]	422[a]	296[b]	293[b]	399[a]	34.9	<0.05
Days from treatment 1 to 2	36[a]	41[b]	51[c]	59[d]	2.2	<0.05
Days from treatment 2 to 3	38[a]	47[b]	51[b]	–	1.9	<0.001
Total treatments administered	2.7[a]	2.1[b]	1.4[c]	1.5[bc]	0.06	<0.0001

[a,b,c,d]Within rows, means with differing superscripts differ significantly.
[1]PRG = perennial ryegrass only; PRGWC = perennial ryegrass and white clover; 6S = 6 species (perennial ryegrass, timothy, white clover, red clover, plantain and chicory); 9S = 9 species (perennial ryegrass, timothy, cocksfoot, white clover, red clover, birdsfoot trefoil, plantain, chicory and yarrow).
[2]epg: Eggs per gram.

Animal Health – Anthelmintic Properties

In other studies…

- chicory, birdsfoot trefoil (Marley *et al*, 2003)
- ribwort plantain (Judson *et al*, 2009)
- yarrow (Tariq *et al*, 2008)

…have all been reported to reduce parasite burden in sheep.

Opportunities of Multi-Species Swards

Soil Health

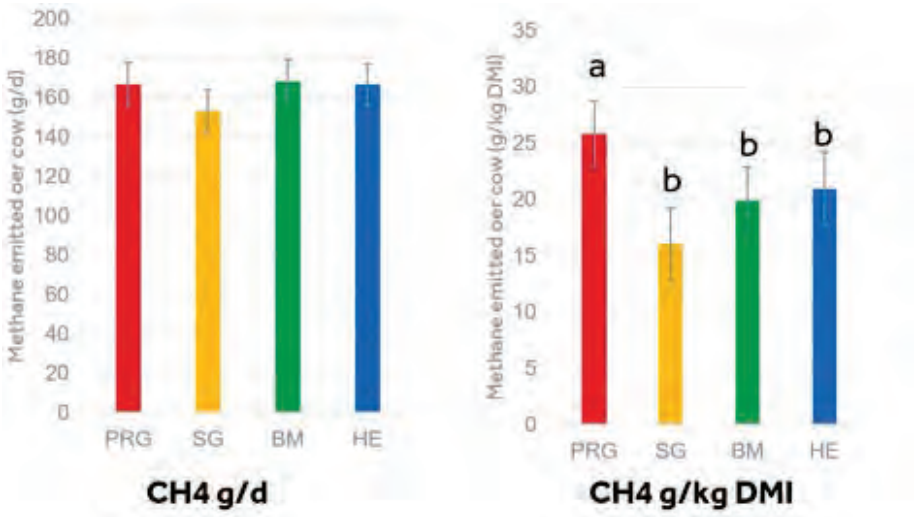
Duchy College, Rothamsted and Plymouth University

Preliminary findings:

- Deep rooting species can break up compacted soils
- Puts carbon deeper into the soil
- Improved soil organic matter

Environment

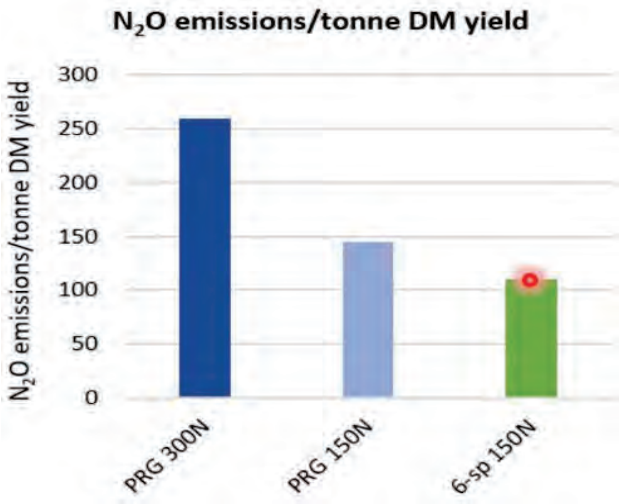
- Lower CH_4 emissions from MSS than PRG (Humphries *et al,* 2021)



Opportunities of Multi-Species Swards

Environment

- Lower N_2O emissions (Cummins in review)



Meat Quality

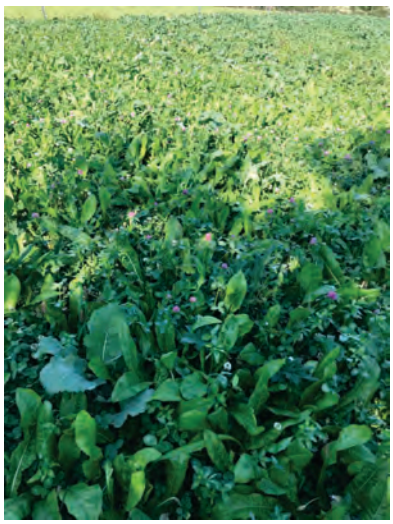
- Multi-species swards containing plantain and chicory have been reported to have a higher proportion of polyunsaturated fatty acids (PUFA) than a ryegrass clover sward (Elgersma *et al,* 2013)
- Improved PUFA in lambs on Birdsfoot Trefoil, Knapweed, ribwort plantain, red clover, selfheal and yarrow (Klein *et al,* 2018)
- More research required, particularly in beef.

Opportunities of Multi-Species Swards

Conclusions

OPPORTUNITIES…

- MSS have potential to use less artificial N fertiliser, with positive effects on the environment
- More resilient to drought
- Improved soil structure
- Evidence of improved performance in lambs
- Potential of improved mineral uptake
- Lower requirement for anthelmintics



CHALLENGES…

- Requires different sward management
- Maintaining herbs in the sward

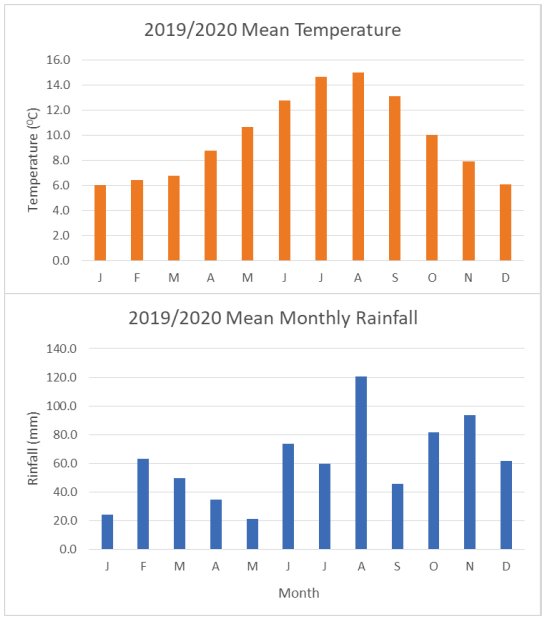
Dale Orr – Churchtown Farm

Farm Aim – Maximise utilisation of grazed grass with minimum external inputs

- 127ha owed / 77ha rented
- Spring 2021
  - Lambed 368 ewes & 73 ewe lambs - 806 live lambs
  - Calved 80 cows & 26 heifers - 103 live calves
- Carcase output is 33.8kg per ewe
- Gross margin is £887 per hectare
- Sheep grazing grass a minimum of 300 days/yr
- Sheep outwintered on stubble turnips & silage
- Have a range of MSS mixes on farm for different purposes

Opportunities of Multi-Species Swards

Location and Climate



Range of sward mixes on farm

White Clover / PRG Sward

- The majority of swards on farm
- Long lasting
- For cutting or grazing
- Best swards - 10tDM/ha/yr

Red Clover / PRG Sward

- Silage swards
- Very productive – 14tDM/ha/yr
- 3 cuts typically (May, July, Sept)
- Additive used

6 Species MSS

- Int. PRG, Late PRG, W. Clover, R. Clover, Chicory & Plantain
- 25 acres established in 2018
- Twin lambs finished faster as opposed to W. Clover/PRG mix

Pure Herbal Ley*

- R. Clover, W. Clover, Plantain and Chicory – leafy and palatable all year
- Established 2020
- To finish lambs quickly with reduced need for wormers

Drought Resistant MSS*

- Cocksfoot, Meadow Fescue, Timothy, R. Clover, W. Clover, Plantain and Chicory
- Established 2021 – EIP Project
- Trial – future proofing the farm

Opportunities of Multi-Species Swards

Farm Walk – Field 1 – Pure Herbal Ley

Seed mixture:

- 1.5kg Aberclaret Red Clover
- 0.5kg Aberchianti Red Clover
- 1.5kg Aberpasture White Clover Blend
- 1.5kg Tonic Plantain
- 1.0kg Puna II Chicory
- *Redstart Nurse Crop*

Experience:

- Established 2020
- Good for finishing lambs quickly
- Achieving growth rates of approx. 350g/day
- Similar swards in New Zealand – 400g/day
- Anthelmintic effect – reduced need for wormers (FECPAK)

Farm Walk – Field 2 – Drought Resistant Mix

Seed mixture (per acre):

- 6kg Baraula Cocksfoot
- 1.5 kg Barvital Meadow Fescue
- 0.5 kg Comer Timothy
- 1 kg Aberclaret Red Clover
- 1.5 kg Aberpasture White Clover Blend
- 1 kg Tonic Plantain
- 0.5kg Puna 11 Chicory

Nurse Crop (per acre):

- 1.5kg Redstart (Hybrid Brassica)

Experience:

- Established 2021 – 14.6 acres
- Trial species mix - EIP Project
- Have had 3 dry spring/summers in the last four years – need to future proof
- Hope to compare and contrast to other swards

Opportunities of Multi-Species Swards

Establishment and Management

Establishment Method:

- Plough and Power harrow (x2)
- Roll, Sow (Einbock) and Roll again

Sward Management:

- Rotational grazing
- Paddocks of around 5 acres in size
- Take stock out at higher covers than 'normal'
- Weeds will be present
- Needs a change of mindset – different management to a PRG sward

Super G - AFBI Loughgall & Hillsborough trials

Drs Francis Lively, David Patterson & Gillian Young

Opportunities of Multi-Species Swards

Super G - AFBI Loughgall trials

SUPER-G
SUSTAINABLE PERMANENT GRASSLAND

Two trials

1. component species

2. mixture comparison

- 8 ‘grazing’ cuts plus 3 quality
- assessments over the 2020 growing season

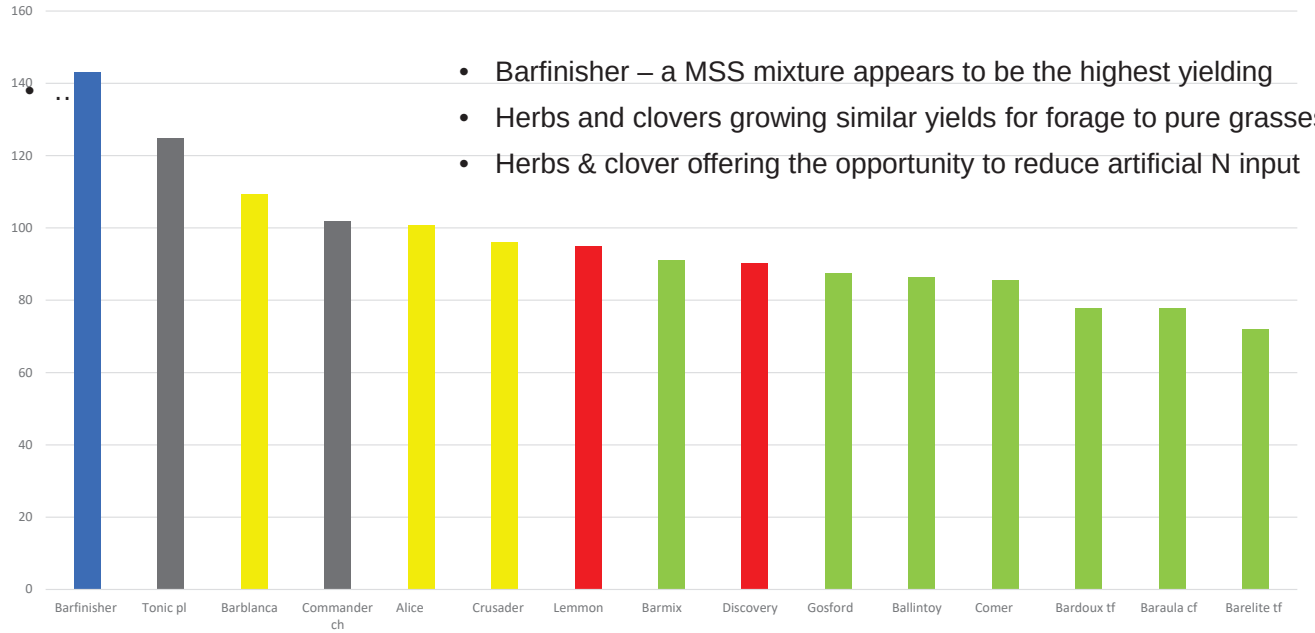
Trial Details

- **Establishment**: sown into clean ground September 2019: conventional ground preparation & shallow drilled
- **Fertiliser**: 82kgN/ha March all plots (24:0:13 & 8:24:24)
  72kgN/ha July grass plots (PRG, Tim, C'foot, T'Fes)
- **Simulated Grazing**: 8 harvests @ ~15cm sward height
  27th April - - - 28th Oct average 26 day regrowth interval
- **Season**: Dry, cold spring – moderate drought until early July – normal late summer/autumn conditions

SUPER-G
SUSTAINABLE PERMANENT GRASSLAND

Opportunities of Multi-Species Swards

Cumulative Fresh Weight Yield 2020 & 2021 (to date) [t/ha]



- Barfinisher – a MSS mixture appears to be the highest yielding
- Herbs and clovers growing similar yields for forage to pure grasses
- Herbs & clover offering the opportunity to reduce artificial N input

Opportunities of Multi-Species Swards

MIX A PRG; WC

MIX B PRG; WC; chicory; plantain

Opportunities of Multi-Species Swards

Cumulative Fresh Weight Yield 2020 & 2021 (to date) [t/ha]

SUPER-G
SUSTAINABLE PERMANENT GRASSLAND

Livestock studies: AFBI Hillsborough & Loughgall

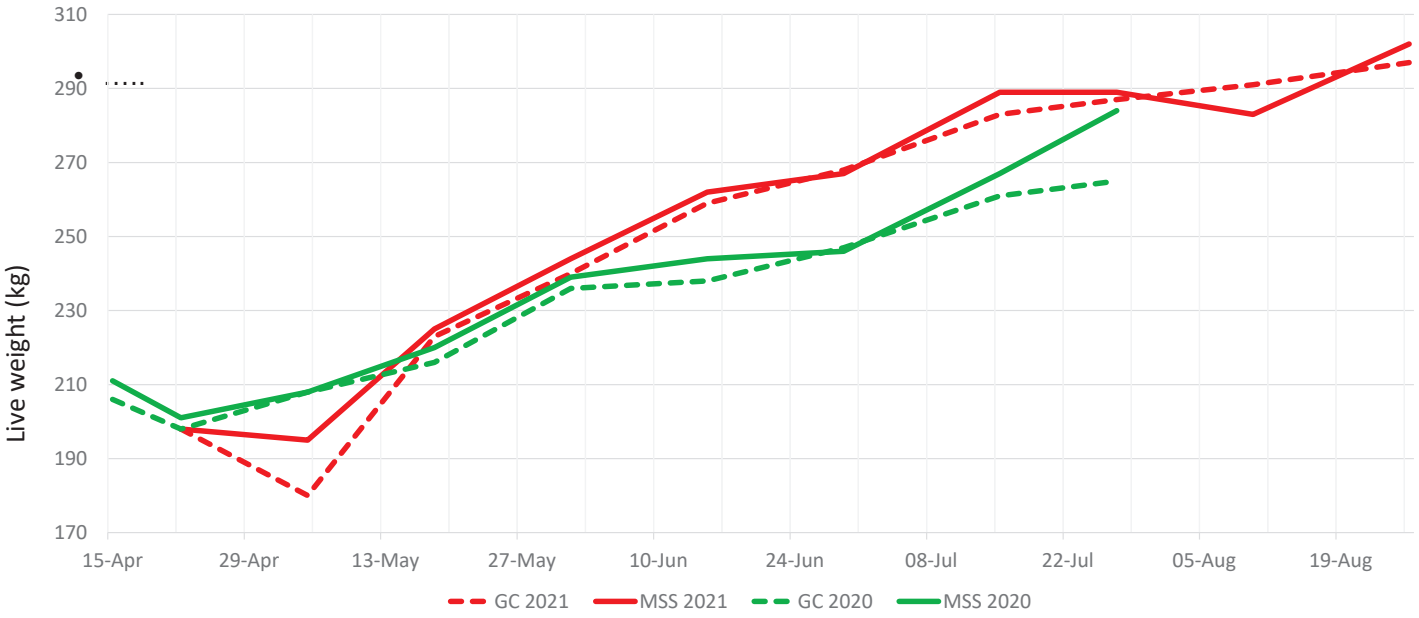
Opportunities of Multi-Species Swards

Management of autumn born dairy origin calves grazing Mixture A and B

- Autumn born Holstein steer calves were turned out to pasture in spring 2020 and spring 2021
- 2 groups of calves grazing Mixture A and 2 groups grazing Mixture B
- Rotationally grazing in 4 paddocks (moved each 6-7 days)
- Sward management
  - Received 75 kg N in spring
  - 2020 management – sward topped post grazing from June onwards
  - 2021 management – additional animals added to control grass heights (no topping)

- Grazing heights
  - Spring 10cm down to 6 cm
  - Summer 10–15 cm down to 8 cm
  - Autumn 15–20 cm down to 6–8cm

Performance of dairy origin calves on grass clover or MSS swards at AFBI



Opportunities of Multi-Species Swards

Animal health

Fecal Egg Count

	Mix A (GC)	Mix B (MSS)
20/4/2021	0	0
18/5/2021	39	18
15/6/2021	27	15
10/8/2021	108	51

Lower FEC with the MSS animals

Trace element analysis

	Mix A (GC)	Mix B (MSS)
Copper	19.9	20.5
Selenium	153	151

No evidence of differences

Bloat

- Calves had to be removed from the study in Aug 2020 due to high incidence of bloat
- During 2021 a number of calves in both treatments have been treated for bloat

Management to avoid bloat has included:

- Adding linseed oil to the drinking water
- Avoiding movement into wet pasture
- Providing extra roughage

On - farm production data

FARM	Livestock	Mix A (GC)		Mix B (MSS)	
		Utilized yield (kg/DM/ha)	Fertilizer (kg N/ha)	Utilized yield (kg/DM/ha)	Fertilizer (kg N/ha)
A	Sheep	**9723**	87	9174	56
D	Sheep	**3785**	53	3513	53
D	Sheep	3132	25	**4690**	25
B	Beef	6900	32	**6950**	32
C	Dairy	7085	135	**8155**	135
C	Dairy	5304	96	**6052**	96

Opportunities of Multi-Species Swards

Preliminary indications from local research

- MSS swards can produce comparable yields to grass clover swards
- MSS swards or grass clover swards offer opportunity to reduce chemical fertiliser requirement
- MSS swards can maintain or enhance animal performance relative to grass clover
- MSS swards appear to reduce worm burdens in livestock which would reduce anthelmintic requirement

These are preliminary results but more local research is required confirm these findings

SUPER-G SUSTAINABLE PERMANENT GRASSLAND

THIS PROJECT HAS RECEIVED FUNDING FROM THE EUROPEAN UNION' HORIZON 2020 RESEARCH AND INNOVATION PROGRAMME UNDER GRANT AGREEMENT N. 774124

Earthworms and multi-species sward

Chris Boughton (Queen's University Belfast)

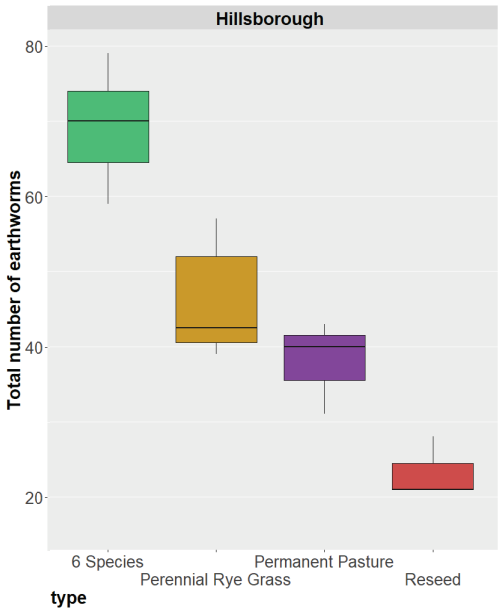
Opportunities of Multi-Species Swards

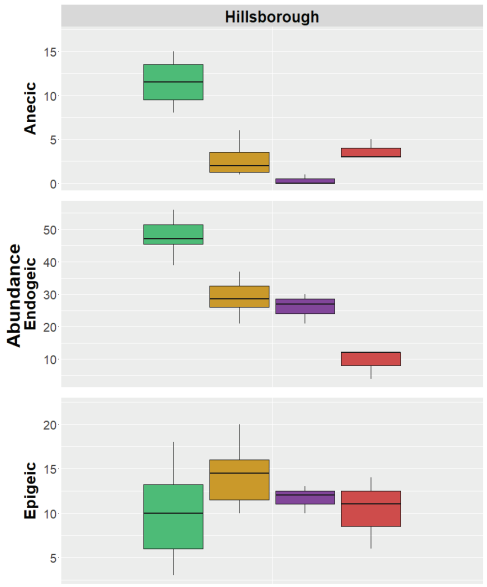
What role do earthworms provide to Agriculture?

- Agricultural soils, and all soils, are often considered as one entity but this omits much of the complex ecosystems that it contains.
- Earthworms provide many general roles that are vital to ecosystem functioning and agricultural performance such as improved nutrient cycling, mineralisation of N/C, increased carbon sequestration, stimulation of microbial activity and improved decomposition of organic matter.
- There are also guild, and species, specific roles that are hugely beneficial to agriculture. For example, anecic species provide roles in soil aeration and water filtration.

Size of an anecic earthworm burrow entrance

Total number of earthworms across different sward types (left) and, Abundance of different earthworm guilds across sward type (right)





N.B.
Both graphs represent samples for the abundance of earthworms (total or guild) per 0.16m²

Opportunities of Multi-Species Swards

Earthworm samples from a perennial rye grass pasture (left) and a multi-species sward (right)

Visibly fewer earthworms from the left sample (PRG) compared to the right (MS).

The size of the earthworms can be a key feature for some guilds, larger species are typically anecic species – which are far more abundant on the right photo (MS) than the left (PRG).

Key conclusions from the data

- Total earthworm abundance, considering all earthworm guilds, was significantly higher within multi-species swards compared to perennial ryegrass or permanent pastures.

- Multi-species swards yielded a significantly greater abundance of anecic species compared to both the perennial ryegrass and permanent pasture samples.

- Endogeic species were also found in significantly higher abundances within multispecies swards compared to perennial ryegrass or permanent pastures.

Opportunities of Multi-Species Swards

What my results suggest about multi-species swards for agriculture

- Considering the role of earthworms, my data suggests that multi-species swards promote anecic species which have subsequent impacts on water filtration and soil aeration. The effect of MSS swards on earthworms could in turn help **alleviate some of the negative effects of extreme rainfall** events on pasture – **reducing field flooding occurrences.**

- The increased earthworm abundance within multi-species swards can also **improve nutrient cycling, carbon sequestration and Carbon/Nitrogen mineralisation**, **improving** the **soil quality for plant growth.**
  - On grazed pastures, earthworms provide a large role in the **incorporation of minerals from dung pats back into the soil.**

- Improved earthworm abundances can also **shift plant growth away from root length / width towards shoot length**, as a result **positive effects of earthworms on bioturbation** of soil – reducing the need for lengthy roots. This can result in an **increased yield in the sward height**.

Establishment and Early Management of Multi species swards

Dr David Patterson

Opportunities of Multi-Species Swards

Establishment Questions

- Which field?
- What to sow?
- What method to use?
- Early management?

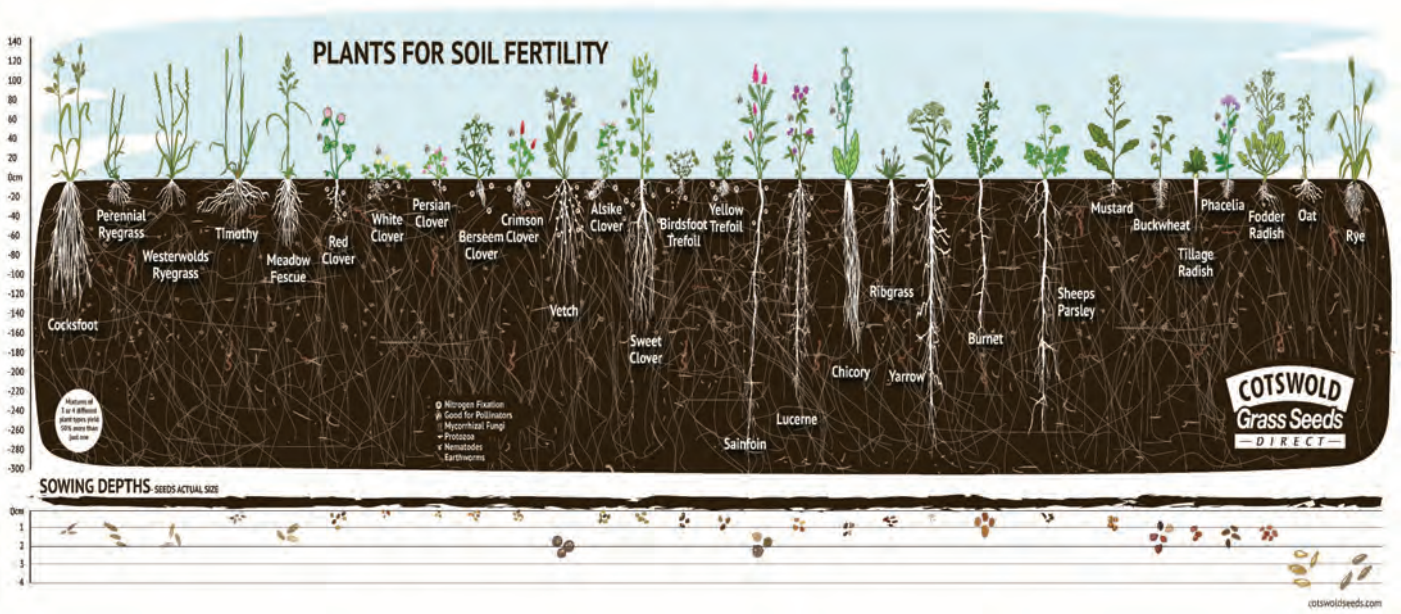
Species Diversity

Opportunities of Multi-Species Swards

Which Field ?

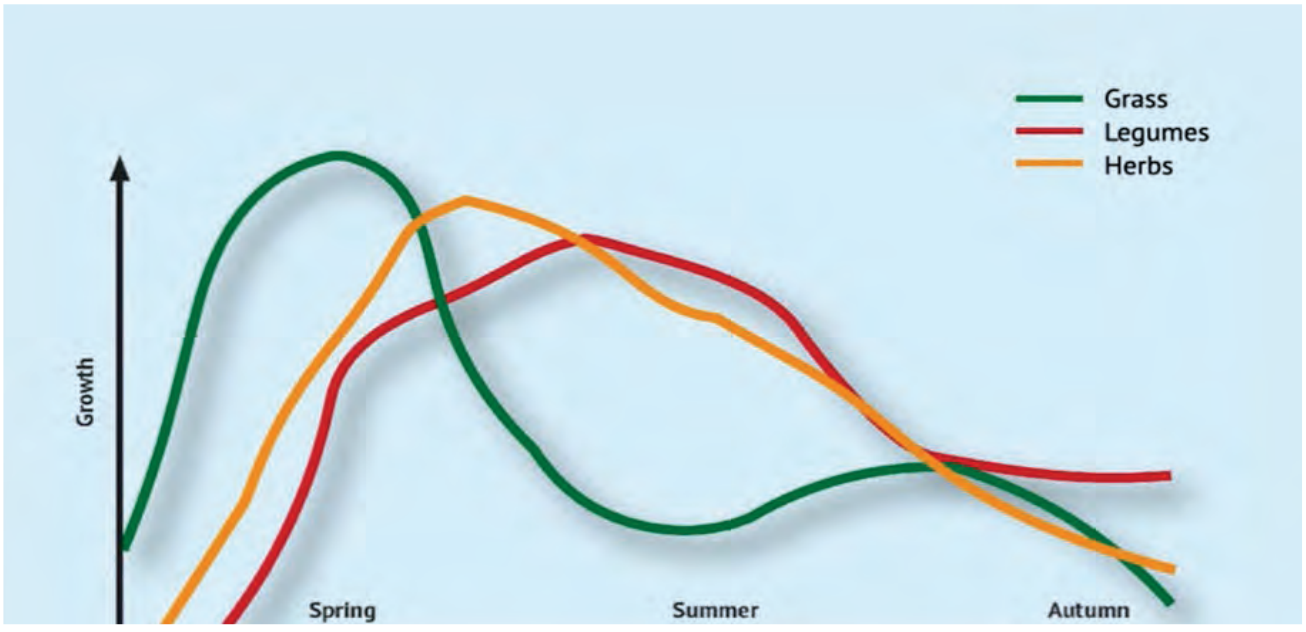
- With MSS there is very limited use of herbicides so select fields that do not have a heavy burden of weeds
- Fields with a good grass content can be overseeded with a clover/herbs only mixture
- The basic field requirements are broadly similar to those for grass/clover swards:
  - o correct soil pH (above pH 6.2-6.5) required
  - o correct soil index for P and K required (above Index 2 for both)
  - o avoid heavy, poorly drained fields
- Soils can be improved through lime, farm yard manure, P&K fertiliser (avoid high N compound fertiliser).
  - o e.g. Index 2: 50kg Phosphate/ha and 40-60kg Potash/ha with a later application of N 25kgN/ha only if required. Seed bed N may only encourage weeds and boost existing grass sward when overseeding.

What to sow?



Opportunities of Multi-Species Swards

Seasonal Growth of Forage



Seed Mixture Examples

Full mixture (for complete reseed)

Species	rate kg/ha
PRG	7
Other grass (eg. Festulolium, Timothy)	7
WC	3.5
RC	4
Plantain	2.5
Chicory	3
TOTAL	**27**

Overseeding Mixture (for sowing into a good grass-only sward)

Species	rate kg/ha
Other grass (eg. Festulolium, Timothy)	4
WC	3
RC	4
Plantain	4
Chicory	6
TOTAL	**21**

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Drought tolerant mixture (per ha)

kg		
15	Baraula	Cocksfoot
3.75	Barvital	Meadow Fescue
1.25	Comer	Timothy
2.5	Aberclaret	Red Clover
3.75	Aberpasture	White Clover
2.5	Tonic	Plantain
1.25	Puna II	Chicory
3.1	Redstart	Hybrid Brassica
33		

Which Establishment Method ?

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When to Sow? Spring vs. Autumn

Cultivation Options

TOMS project compared:

1. Plough
2. Power harrow
3. Disc harrow

Findings:

- No difference in total annual DM yield
- Sown species was more abundant and less weeds in ploughed plots

Considerations:

- costs
- time/season

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Seed Bed Preparation

- A firm, well consolidated, fine seed bed is essential
- When using min-till methods, create some bare earth at the surface and reduce the competition from the existing grass sward by repeated passes with spring tine harrows.
- To minimise any trash residue at or near the soil surface:
  - graze as tight as possible (ideally with sheep) prior to seed bed preparation OR mow for silage
  - harrow the soil surface with passes in different directions
- The depth of seed bed is very important. If seeds are placed too deep, the seedlings will never emerge. Clover, Timothy, chicory & plantain are all very small seeds therefore aim to place seeds no deeper than 10mm

Spring tine harrow

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Post - Sowing

- After sowing the seed bed may need to be rolled twice, once in either direction.
- Seed:soil contact and soil moisture are vital for successful germination. If surface is very dry and no rain is forecast, wait for the correct weather window.

Weed Control

- It is essential to control any broad-leaved weeds such as docks, thistles pre-sowing, as once the sward is established there are no herb-safe herbicides available to control dock, chickweed etc.
- After ploughing the ‘stale seed bed’ method can be used to ‘exhaust’ the population of weed and grass seeds near the soil surface.
- Sowing in April or in July-August is recommended, as germination and growth is limited when soil temperatures drop below 10°C in late summer.
- Slug pellets can be used to enhance establishment if required.

Notes on Spraying if using Roundup Biactive GL

- In a fully prepared clean soil seed bed wait at least 5 days post spraying before seed sowing.
- In a min-till situation where the old sward is sprayed off, drill in new seed at least 5 days after spraying, provided there is no matted material just below the surface.
- In a tightly grazed off and harrowed sward (i.e. not sprayed off), seed sowing can be completed and grazing stock returned straight away (close grazing for another week will be needed to minimise competition from the established sward to new emerging seedlings).
- Alternative herbicides – always check the specific label instructions for any herbicide used for sward destruction and seed bed spraying, especially in 'min-till' situations if any mat is present.

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Stale Seed Bed Method

- Spray off old sward before soil preparation
- Cultivate to prepare the seed bed
- Leave the field for 10-14 days (soil moisture-depending) to allow the weed seeds to germinate
- Remove the germinated weed seeds:
  - Spray off (preferred option), or
  - Use a trailed harrow to dislodge weed seedlings - this must be shallow to prevent more weed seedlings coming through at a later date.
- As soon as possible after weed removal sow the seed mixture, with minimal soil disturbance

Well Established Swards

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Rooting depths

Grass Clover

Plantain

Chicory

Post sowing sward management

- The crop should be ready to graze from 8-10 weeks post-establishment, depending on growing conditions AND wait until herbs have at least 6-7 leaves per plant.
- Rotational grazing should be employed when grazing. Continuous grazing can result in a significant decline in plant density in the sward, compared to rotational grazing systems. In general, the sward requires short, intensive periods of grazing to 7-8cm, with sufficient rest/recovery periods of 4-5 weeks between grazings.
- Under-grazing should be avoided and will result in the production of less palatable material and reduction in nutritional value and utilisation. The first grazing should be completed over 4-5 days to encourage establishment and sward density.
- Avoiding poaching and subsequent sward damage is essential to maintain yields in subsequent years.

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Summary

- select suitable field/s on the farm for MSS
- use appropriate seed mixtures eg drought mix
- decide on cultivation method
- allow time for plants to fully establish post sowing
- rotational grazing is preferred

Take Home Messages

- Multi-Species Swards have the potential to:
  - Reduce fertiliser use
  - Improve soil health and biodiversity
  - Reduce GHG emissions and improve carbon sequestration
  - Improve drought resilience
  - Maintain/enhance animal performance
  - Reduced use of anthelmintics
- BUT
  - They are more challenging to establish and manage than traditional PRG based swards
  - Weed control and persistence of herbs can be an issue
  - Better to establish a reasonable area to avoid animals switching sward types

Knowledge gaps remain – further research needed

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- Keep up-to-date with the project via the AgriSearch website and social media channels
- Further events are planned for next year