

Optimising the benefits of clover in grassland



James Humphreys¹, Dan Barrett¹, Dan Clavin¹, Katie Scully^{1,2} & Imelda Casey²

¹Teagasc;

²Waterford Institute of Technology

Why clover on pasture-based beef and sheep farms?

Biological N fixation

Higher herbage production with lower inputs

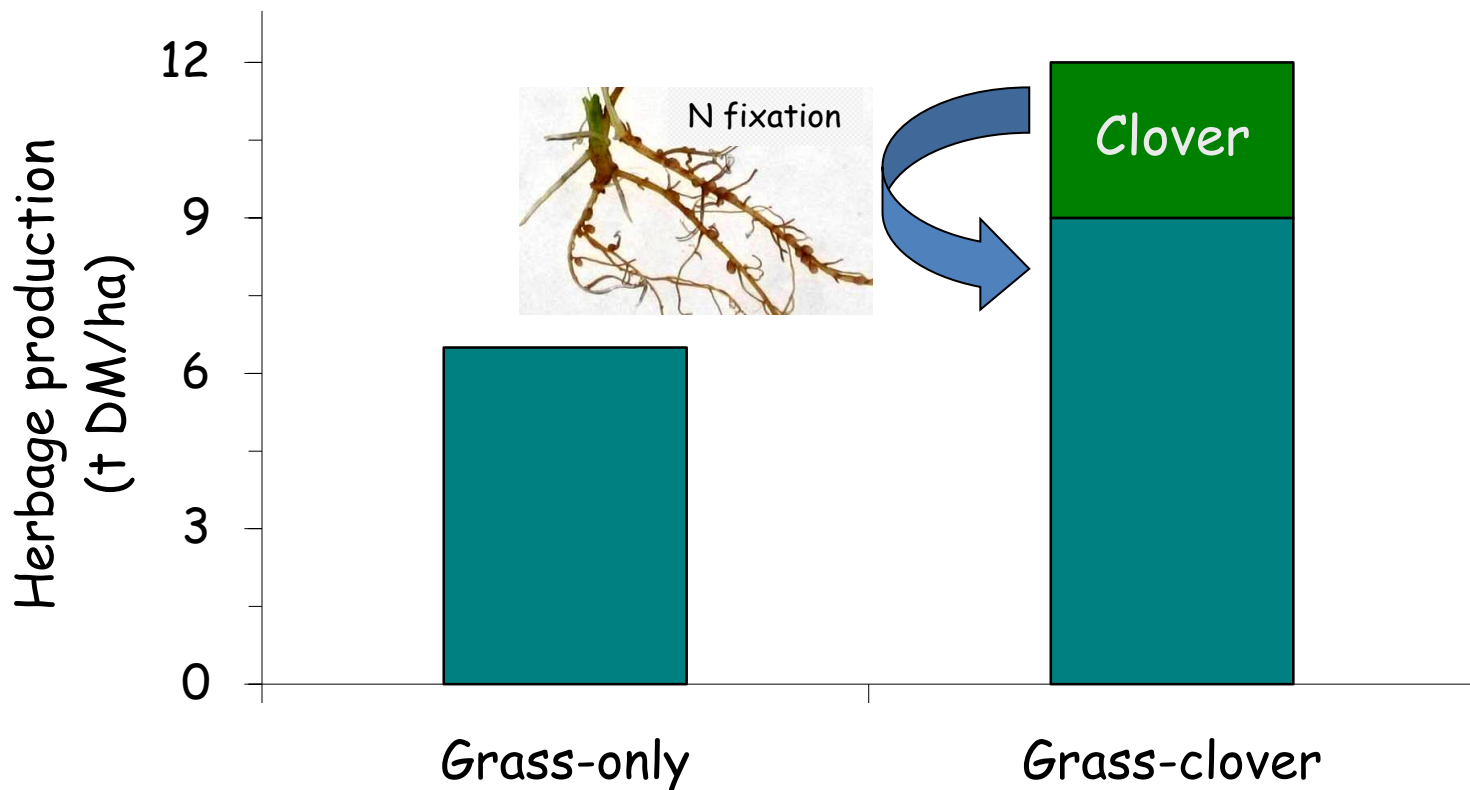
Higher animal performance

Lower environmental footprints

Green deal?



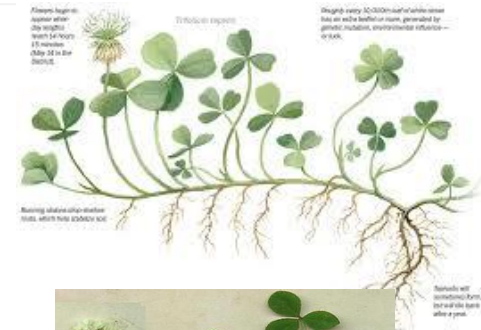
Impact of clover/biological N fixation on herbage production



Growth habit of white clover

During seedling establishment white clover develops a tap root

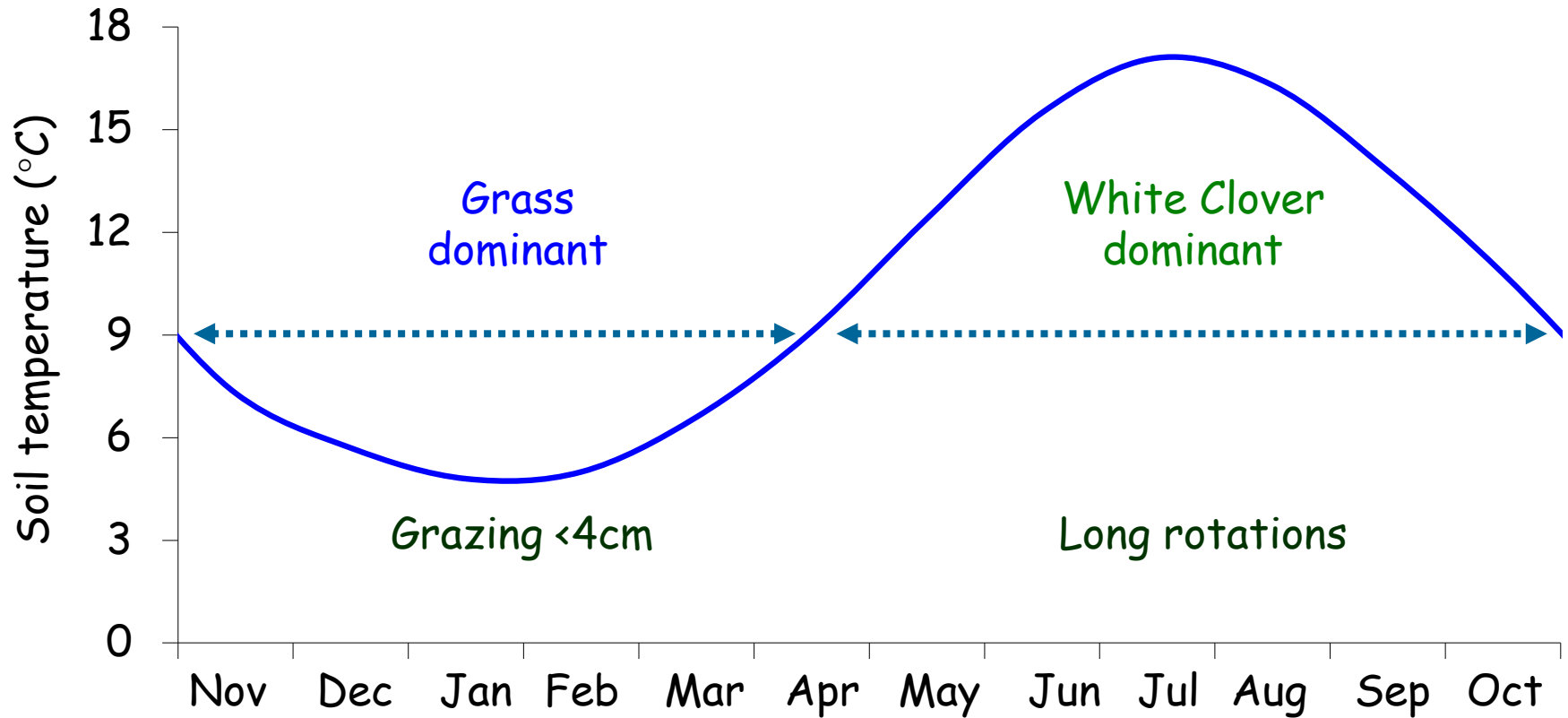
It subsequently produces stolons; crucial for survival in mature swards



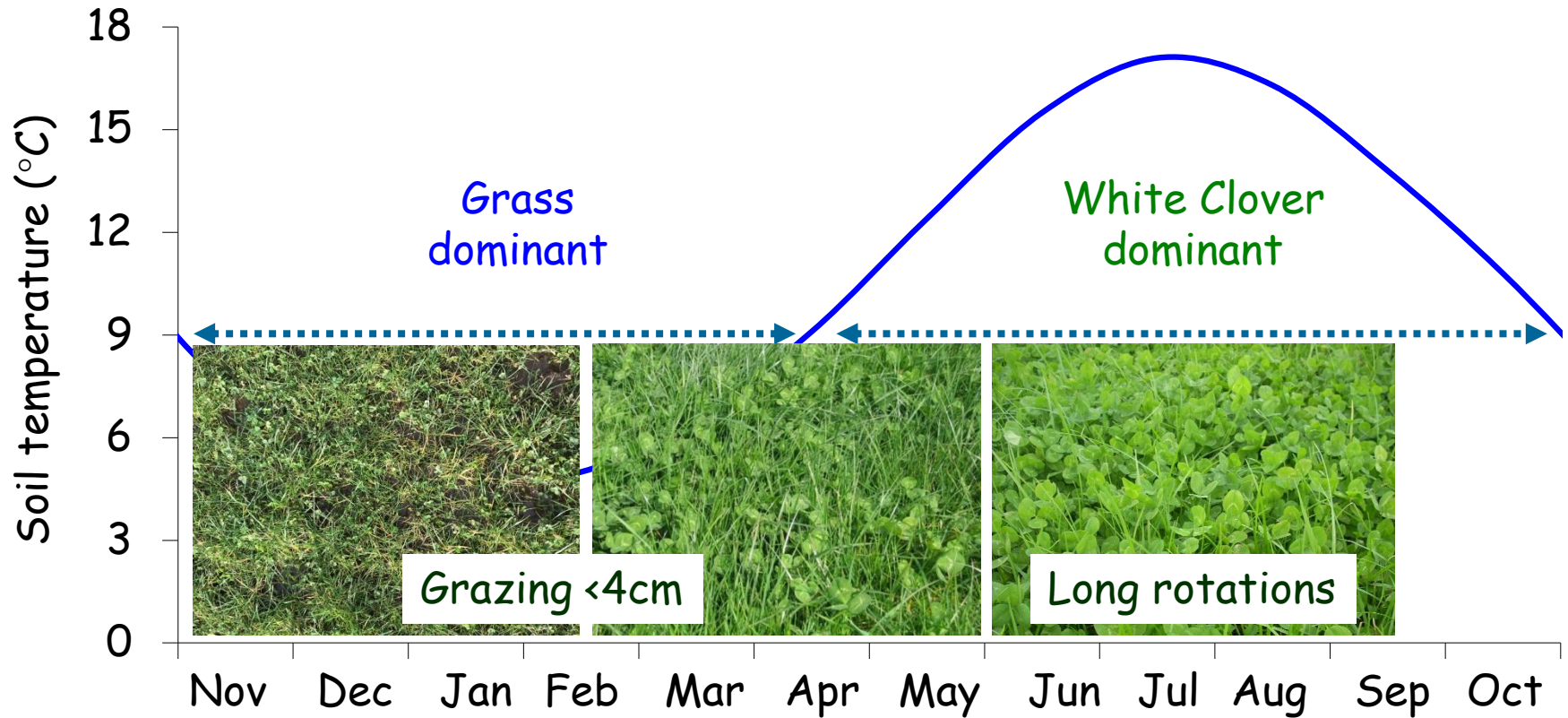
Managing the interaction between grass and clover



Soil temperatures & grass and white clover growth



Soil temperatures & grass and white clover growth



Grazing Management: October to April

Grazing to <4 cm from October to April with light cattle or sheep

Allows light down to stolons and improves stolon survival

Substantially increases sward clover content in following year

Increases biological N fixation by 35%



Grazing Management: late summer and autumn

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Clover dominant swards from June to October

Lengthen grazing rotation from mid-July to 42 days by mid-September

Promotes high levels of biological N fixation and stolon production

Build up a big reserve of high-quality pasture by mid-September

Grazing Management: post-grazing height

Grazing to <4 cm is important throughout the year

Tighter grazing increases clover content and biological N fixation

No difference in animal performance with good management

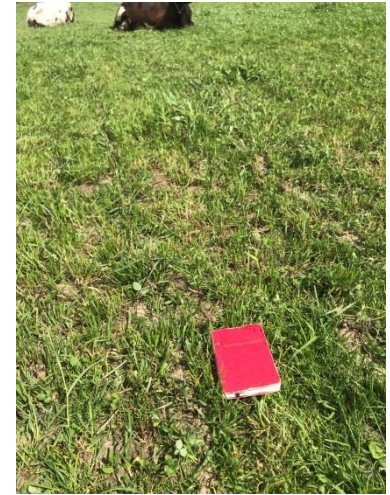


Fertilizer Nitrogen

Fertilizer N depresses sward white clover content and biological N fixation

Band spreader or trailing shoe slurry application for spring growth and silage

Tactical use of fertilizer N depending on pasture cover targets



Recommended fertilizer N for clover-rich swards

Stocking rate (LU/ha)	<1.75	1.75 to 2.00	2.0 to 2.25	2.25 to 2.50
	(kg/ha)			
February	0	28 [†]	28 [†]	28 [†]
Mid-March	0	28	28	36
April/early May	0	0	28 [*]	36 [*]
May	0	0	0	0
June	0	0	0	0
July	0	0	0	0
August	0	0	0	0
Mid-September	0	0	0	36 [*]
Total	0	56	84	136

Managing soil N levels



Mixed grazing and harvesting for silage increases the white clover content of herbage, biological N fixation & sward persistency

Fertilization: P, K & lime

Apply lime to bring soil pH up to 6.3 to 6.5

Regular application of P & K compound depending of soil test results



Reseeding & over-sowing



Reseeding at 10-year intervals at Solohead Research Farm

Over-sowing with white clover at least once within each interval

Seed mixture for grazing and silage (Acre packs)

Species	Cultivar	Rate
PRG	Abergain	5.0 kg
PRG	Aberchoice	5.0 kg
Red clover	Aberchianti	2.0 kg
White Clover	Buddy	1.5 kg
Hybrid Clover	Aberlasting	1.0 kg

Species	Cultivar	Rate
PRG	Astonenergy	5.0 kg
PRG	Astonconqueror	5.0 kg
Red clover	Milvus	2.0 kg
White Clover	Crusader	1.0 kg
White Clover	Chieftain	1.0 kg

Late heading perennial ryegrass cultivars (PRG)

Red clover: very high production in first 2 to 4 years

White clover and hybrid clover: persistent in the sward

DAFM Recommended White clover Varieties 2020

Control Mean:9.4 † DM/ha

Variety Name	Rel. yield (%)	Leaf Size	Clover (%)	Year listed	Breeder
Barblanca	105	Large	50	2009	Barenburg
Violin	101	Large	44	2020	DLF
Dublin	102	Large	50	2018	Teagasc
Chieftain	98	Medium	47	2005	Teagasc
Buddy	100	Medium	45	2015	Teagasc
Iona	94	Medium	44	2014	Teagasc
Crusader	95	Medium	42	2009	Barenburg
Aberherald	97	Medium	45	2003	IBERS
Coolfin	104	Small	47	2017	Teagasc
Galway	95	Small	38	2017	Teagasc
Aberace	95	Small	33	2016	IBERS

Seed mixture predominantly for silage (Acre packs)

Species	Cultivar	Rate
Hybrid RG	Astoncrusader	9.0 kg
Red clover	Milvus	4.0 kg
White Clover	Barblanca	1.0 kg



Red clover mixture:

Very high production for 3 to 6 years; annual production of 13 to 16 t DM/ha

Fixes >300 kg N/ha. **Very high requirement for K & P.**

Four-cut system with zero-grazing in autumn



Post-emergence dock control



Post-emergence dock control

Hygeia DB PLUS
FOR THE CONTROL OF A WIDE RANGE OF BROAD-LEAVED WEEDS

Contains 240 g/l (21.1%w/w) 2,4DB and 40g/l (3.5%w/w) M.C.P.A as a potassium salt.
Formulation: Soluble Concentrate.
For use only as an Agricultural Herbicide
FOR PROFESSIONAL USE ONLY

MAX DOSE 7L/HA
READ LABEL FOR DETAILS

RISK AND SAFETY INFORMATION
Harmful if swallowed. Causes serious eye damage.

Center or doctor/physician. Dispose of contents/container to a licensed waste disposal contractor or collection site except for triple rinsed empty containers which can be disposed of as non-hazardous waste.

To avoid risks to human health and the environment, comply with the instructions for use

Wash... thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/protective clothing/eye protection/face protection. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON

DANGER

ADDITIONAL SAFETY PHRASES: Always read labels carefully before use. Use pesticides safely. Keep livestock out of treated areas for two weeks and until poisonous weeds such as ragwort has died and disappeared. Do not contaminate water with the product or its container (Do not clean application equipment near surface water / Avoid contamination via drains from farmyards and roads)

• CLOVER SAFE*
• NEWLY SOWN GRASSLAND
*Apply after the first trifoliolate leaf has appeared on the majority of the clovers, ensuring that the weeds are at the susceptible stage.

20 Litre e

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MANUFACTURED BY:
Hygeia Overseas Ltd,
Droichead, Co. Galway, Ireland.
Tel: 091-794222 Fax: 091-794738
Email: enquiries@hygeia.ie Web: www.hygeia.ie

With 24 hour emergency number:
091-794222

or the control of a wide range of broad-leaved weeds, including Charlock, in all cereals, including undersown and direct re-seeds.

METHOD OF APPLICATION
pints/acre (7 litres/hectare) of the product in 20–50 gallons/acre (220–550 litres/ha) of water in any convenient type of crop spraying equipment. Application should be made in good growing weather and not in cold weather, during drought or if rain is expected.

TIME OF APPLICATION

Spring Oats and Barley: Apply from the first leaf stage Z.C.K. 1.1. until the start of "shooting" or "jointing" Z.C.K. 3.1

Spring Wheat: Apply between the five-leaf Z.C.K. 1.5 stage and the start of "shooting" or "jointing" Z.C.K. 3.1

Winter Wheat, Barley and Oats: Apply when fully tillered in the Spring Z.C.K. 3.0 to the start of "shooting" or "jointing" Z.C.K. 3.1

Cereals undersown with White and Red Clovers: Apply after the first trifoliolate leaf stage provided the cereal has reached the specific stage of growth. With red clover, some leaf deformity may be observed but subsequent growth will be normal.

Direct re-seeds: Apply after the first trifoliolate leaf has appeared on the majority of the clovers, ensuring that the weeds are at the susceptible stage.

Lucerne: Do not use on cereals undersown with lucerne or on seed mixture containing lucerne.

WEEDS CONTROLLED
Black Mustard, Corn Buttercup, Fat Hen, Pennycress, Shepherd's Purse, Yellow Charlock, Redshank (Willow Weed), Pale Periscaria, Treacle Mustard, Small Nettle, Annual Sowthistle, Bulbous Buttercup, Perennial Sowthistle.

Our products are formulated and manufactured to the highest commercial standards, and we believe them to be suitable for the purposes stated, but as we do not exercise control over the mixing or application, no warranty of any kind is made as to the quality or fitness of our goods and no responsibility will be accepted by the manufacturer or seller for damage arising either directly or indirectly from their storage, handling, application or use.

Over-sowing white clover seed into established swards



Bare open sward

Moist soil conditions

2 kg seed per acre (5 kg/ha)

Mix with 'carrier' fertilizer

Apply dirty water/slurry

Max 8 cm pre-grazing height

Low cover over winter

Bloat

We have not lost a cow because of bloat in over 20 years

We have not had to treat any cow for bloat in over 20 years

Sward clover contents ranging from 10 to 50%

Keep cattle on clover from turnout to housing: adapt during the grazing season

Care when moving cattle into swards with very high clover contents

Treatments are available: bloat oil etc.



Conclusions & Recommendations

Graze out to <4cm between October and April; Lower the cost of production

Graze to 4 cm/mowing during the main grazing season; Grow more pasture

Build up covers between July and September; No loss in nutritive value

Feed out during the autumn and early winter; Low post-grazing height during winter

The less fertilizer N applied the better; Increase clover content and BNF

Lower environmental footprint



Conclusions & Recommendations

Alternate grazing & harvesting for silage; Mine out soil N under grass dominant

Regular application of K and P; Particularly important on red clover silage swards

Reseeding and over-sowing to maintain clover contents

Post-emergence dock control; you get one opportunity - don't miss it

Avoid bloat by adapting cattle & sheep to clover-rich swards



