An Introduction to Grassland Management

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Quoybrae Mart
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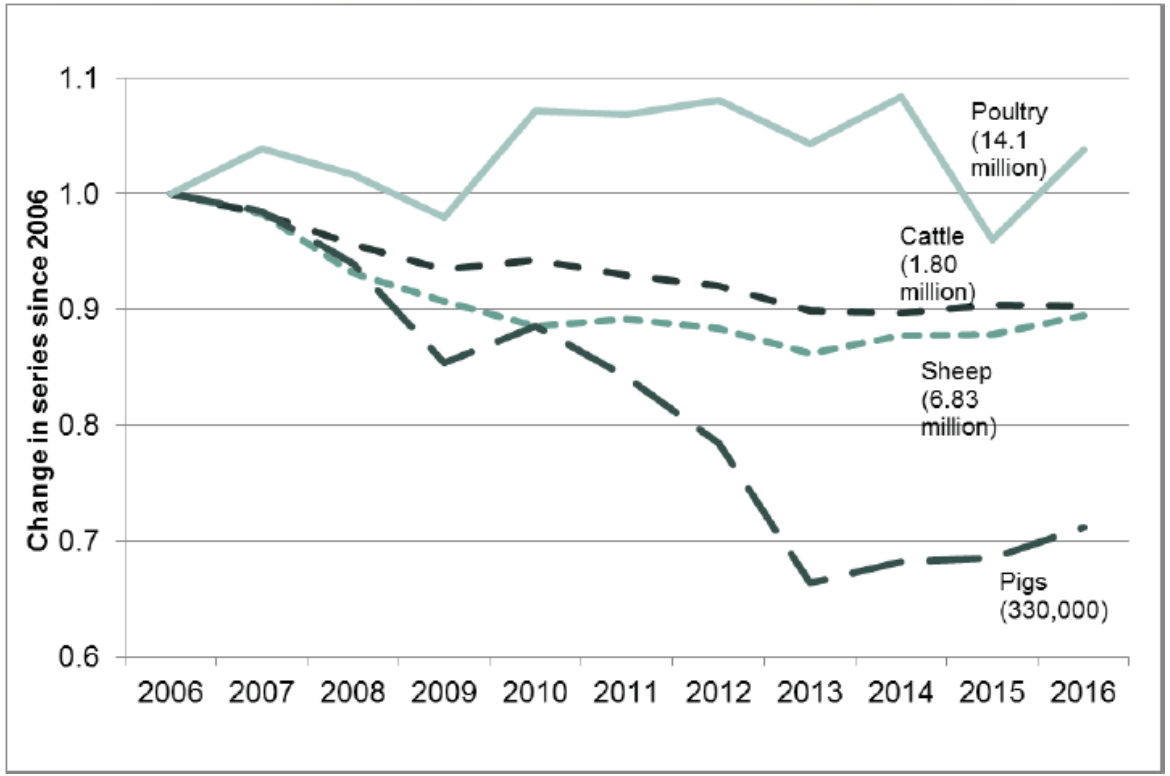
SRUC

DLF SEEDS & SCIENCE

Trends in Livestock numbers Scotland



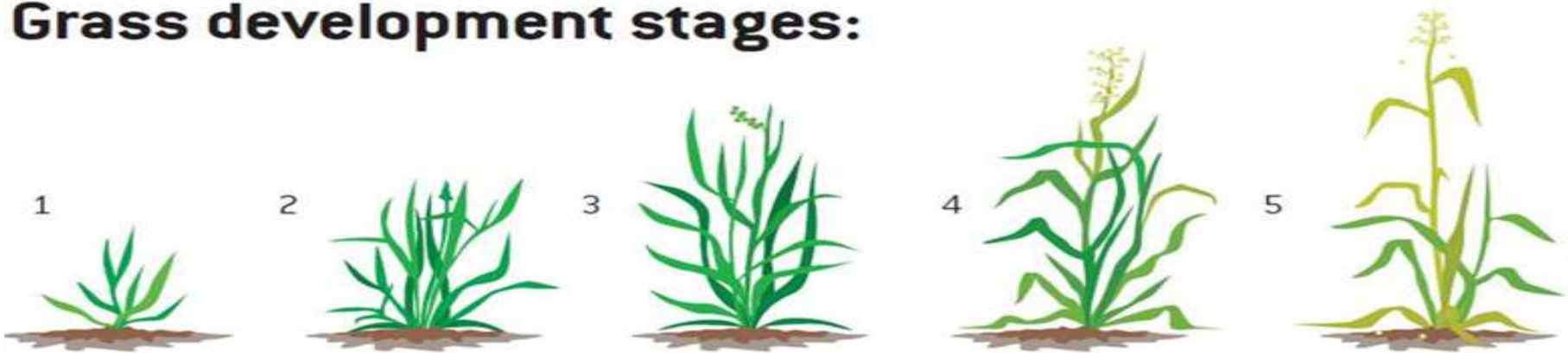
Dry Matter Production

- Grazed Grass 9 to 10 tonnes DM/ha 2.5 to 4 p/kg
- Silage 13 to 15 tonnes DM/ha 9 to 13 p/kg
- Barley & Straw 7.5 + 3 tonnes DM/ha 19 to 26 p/kg (£160 del + costs)
- Barley Straw £130/tonne in the West

- Grazed Grass is the cheapest way to feed ruminant animals

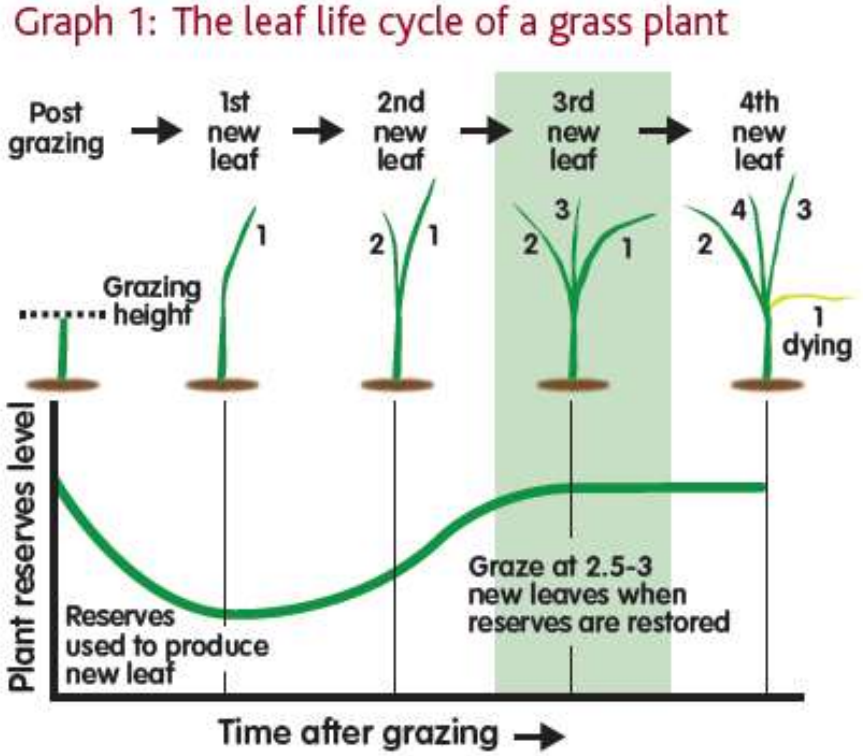
Grass Growth Stages

Grass development stages:



1. Vegetative: Leaves only, stems not elongated. **Time for grazing**
2. Stem elongation: Stems elongating. **Time for making silage with very high feeding value**
3. Boot: Flower head is enclosed in flag leaf sheath and not showing or only showing partly. **Time for making silage**
4. Heading: Flower head emerging or emerged from flag leaf sheath. **Time for making hay**
5. Anthesis: Flowering stage, anthers shedding pollen. **Too late for forage harvest!**

How does a grass plant grow?



With fresh young grass it is possible to maintain an ME of over 12.0 MJ/kg DM for the whole season

Protein averages about 17% in pure ryegrass swards and about 19% with a good clover content.

Utilise grass at the correct height for the class of stock grazing it

Grazing sheep

Table 3: Sward height targets for sheep

Class of stock	Grazing period	Rotational grazing		Set stocking (cm)
		Pre-graze (cm)	Post-graze (cm)	
Ewes and lambs	Turn-out - May	8-10	4-5	4
	May - weaning	8-10	4-6	4-6
Pre-tupping	Sep - Nov	8-10	4-5	6-8
Weaned finishing lamb	Jul - Sep	10-12	5-7	6-8

Grazing cattle

Table 4: Sward height targets for beef

Class of stock	Grazing period	Rotational grazing		Set stocking (cm)
		Pre-graze (cm)	Post-graze (cm)	
Cows and calves	Turn-out - May	10-14	5-6	5-6
	June - July	12-15	7-8	7-9
	Aug - Nov	12-15	8-9	7-9
Growing/finishing	Turn-out - May	10-12	5-6	5-6
	June - July	10-14	6-7	6-7
	Aug - Nov	10-15	7-8	7-8

Benefits of Rotational Grazing

Table 5: Effect of moving from a set stocking system to paddock grazing

Strategy	Annual yield (t DM/ha)	Utilisation (%)	Useable yield (t DM/ha)	Percentage increase
Set stocking	8.5	50	4.3	
Rotational	10.2	65	6.6	56%
Paddock	10.2	80	8.2	92%

Rotational grazing and paddock grazing do not suit all farms or farmers

Yield of Grass (DM/Ha) v Quality in Silage

Figure 1: D-value will vary depending on leaf/ stem growth.

72 D-value, leafy growth. Typical first cut yield of a long term ley – 4.6t DM/ha

68 D-value, lengthening of stems. Typical first cut yield of a long term ley – 6.1t DM/ha

65 D-value, flower heads emerging. Typical first cut yield of a long term ley – 7.5t DM/ha

As a grass plant gets older its

DM Yield increases
Protein and ME decrease
Lignin and Hemi-Cellulose increase

To make higher protein, higher energy silage

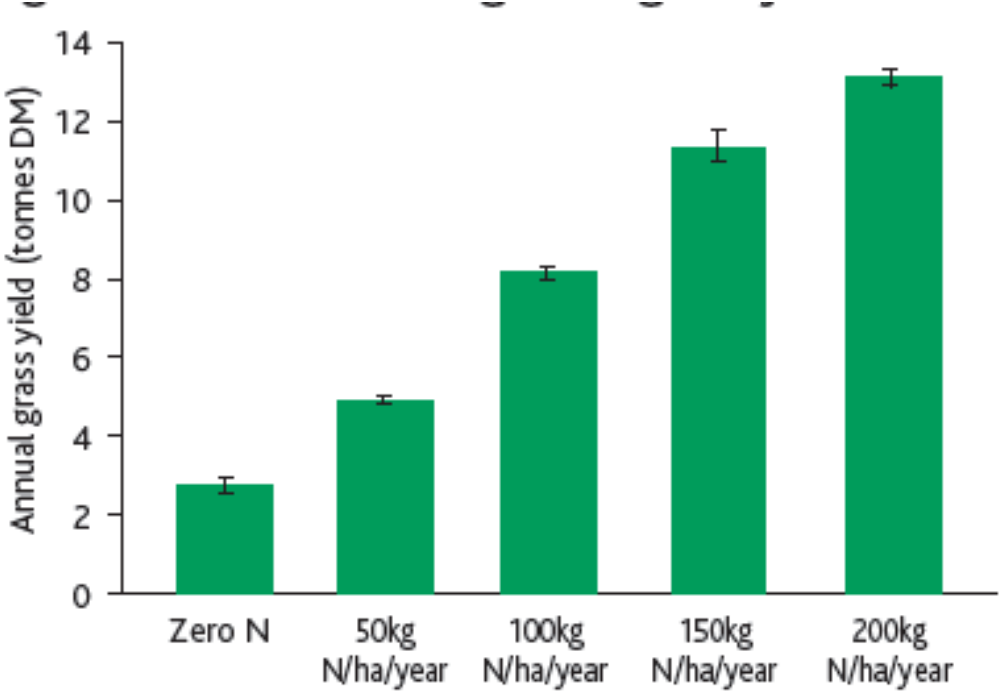
Cut it earlier

Ear Emergence as a quality guide for Silage

	Good	Moderate	Poor
D-value	70	65	60
% of ear emergence	25%	50%	100%
Energy ME (MJ/kg DM)	11.5	10.5	9.5
Crude protein content %	16	12	10
Feed to:	Finishing stock, ewes carrying multiples	Growing cattle, autumn-calving suckler cows, ewes carrying singles	Dry stock, spring-calving suckler cows

Key: D-value = measure of feed digestibility.

Nitrogen Input



Extending the season with Species

For really early production there are several options

Early Perennial Ryegrass

Timothy	Thrives on cold, wet, high land
Cocksfoot	Hard to manage, does well on very sandy land
Festuloliums	Stress tolerant, early, high yielding

Festuloliums are crosses between ryegrasses and fescues. They occur naturally in the wild

Tolerant of drought and water logging and very clean

Perseus 17th April 58 cm tall

Perseus is a FESULOLIUM
It is a cross between
Italian Ryegrass and tall Fescue

It will last 3 years
Is very Stress Tolerant (big roots)
Disease free

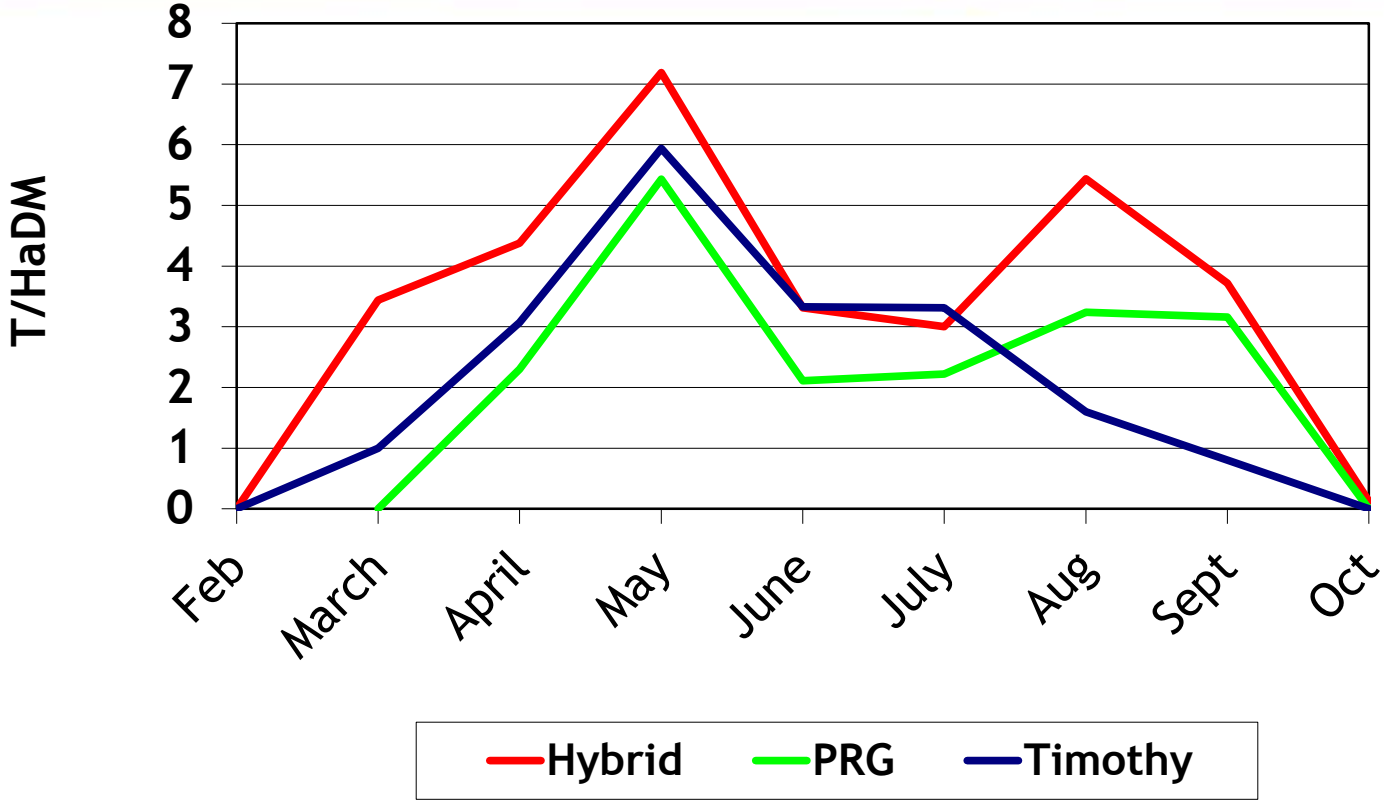
Hybrid Ryegrass on the LHS V Perseus on the RHS

At DLF Seeds we call Festuloliums

GRASSES Advanced™


ITALIAN RYGRASS
ADVANCED GRASSES
ITALIAN RYGRASS
GRASSES
Advanced™

Seasonal Growth Patterns



Why use Mixtures

- No single perfect grass variety (or often species) for all situations
- Utilize differences in the components, ie. clover and grass, early and late heading etc.
- Buffer weaknesses
- Areas are often heterogeneous and a mixture can adapt more widely: E.g. some parts of a field with dry soil some parts more exposed to water etc.
- Higher security in case of failure
- Complementary in time and space (persistency)

What do Scottish farmers want?

- Generally a medium term dual purpose mixture
- Proven brands
- Very dense and hard wearing
- Winter hardy
- High quality varieties
- Often 5% to 7% of white clover inclusion
- All SAC varieties
- Sow at 14 to 15 kg/acre

Grass Mixture Components

- Perennial Ryegrass
  - Early Perennial Ryegrass
  - Intermediate Perennial Ryegrass
  - Late Perennial Ryegrass
- Italian Ryegrass
- Hybrid Ryegrass
- Timothy
- Cocksfoot
- Creeping Red Fescue
- White Clover
- Red Clover
- Advanced Grasses - Festuloliums

Options with Grass and Clover

- Direct sow a full Mixture on its own
- Direct sow a full mixture with Westerwolds
- Undersow a spring cereal or wholecrop/ arable silage
- Overseed existing grass sward ProNitro® seed treatment
- Other options

Westerwolds

DLF currently have
11,000 breeding lines
On Westerwolds alone

Undersown Cereals / Wholecrops

Where grass establishment is the paramount consideration

- **Undersow a spring cereal which is to be combined**
  - Reduce the cereal seed rate from normal levels
  - Reduce the Nitrogen content by about 25 kg/ha
  - Remove straw swaths as soon as possible
  - Keep clean from weeds and diseases

- **Undersow an arable silage or cereal mixture for the forager**
  - Do not be tempted by high contents of broad leaved crops
  - Cut about 4 to 4 ½ weeks prior to “Combining date” - cereals at soft cheese

- Improve your vermin controls

Overseeding

- Quick, easy, lower cost and can be very effective
- No production gap
- Limited sowing window under cutting but more flexibility under grazing
- Not an instant fix and several months before full benefits are realised
- Overseeding has massive potential to improve grassland performance provided conditions are right
- Ideal way to increase clover levels in an existing sward
- Overseeding is **ALWAYS** a compromise

Wire Tine Machines

Thick Tines
Aggressive Action

Many other Grass drills available

Grain Drills

Very successful at re-introducing clover

ProNitro® Seed treatment

Lincolnshire
2015

Red Clover

- Produces 4 times the yield of white clover (13 tonnes DM /ha)
- Cutting species which will die out under constant grazing
- Lifespan of 3 – 4 years
- Grown for high yields of high protein silage and superb aftermath grazing
- Will cut up to 4 times a year with autumn grazing
- Avoid grazing with breeding animals before and after tupping due to oestrogen content

Red Clover Silage - Typical

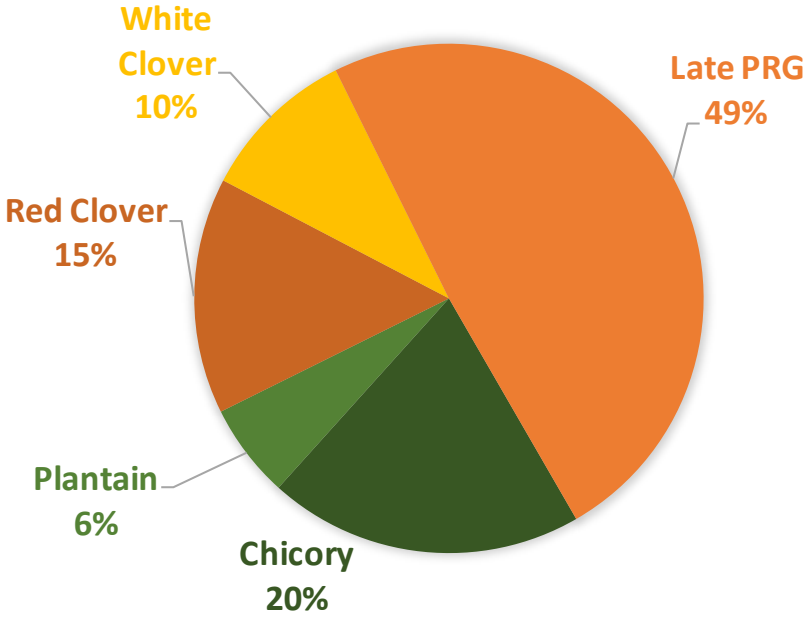
Digestibility	60 – 70%
Dry Matter Yield	10 – 15 tonnes DM /ha (4 – 6 tonnes DM/acre)
Dry Matter	25 – 30%
Fresh Yield	40 – 60 tonnes/ha (16 – 25 tonnes/acre)
Crude Protein	15 – 20%
Energy (ME)	10.0 – 11.5 MJ/kg DM

Perennial Chicory

- 3 ½ to 4 years life
- Included in mixtures at 0.75 kg/acre
- Sown on its own at 2 to 3 kg/acre
- Mixed with clover and/or plantains
  - 2 kgs white clover
  - 1.75 kgs chicory
  - 0.25 kg ribwort plantain

- It is a herb and must have a rest
- Slight anthelmintic property
- Very palatable
- CHOICE Chicory

DLF Seeds Rapid Gain



%	VARIETY	SPECIES	GROUP
20	CHOICE	CHICORY	
6	TONIC	PLANTAIN	
15	RED CLOVER BLEND	RED CLOVER	
10	HF GRAZING PURPOSE CLOVER BLEND	WHITE CLOVER	
49	ASPECT	LATE PRG	TET

Sow at 8 kg/acre
20 kg/ha
20 kg bags

£7.45/kg to farmer

Rapid Gain 2017 sowing

Sown 9th May 2017 at 8 kg/acre
Recommended sowing rate is 8 kg/acre

1st Graze 15th July

Photos and figures from Lorna Galloway, SRUC

Rapid Gain 2017 Trial

Trial Figures from Robert Fleming
South Milton, Glenluce
Scotlands Beef Farmer of the Year 2017

Agrii iForage Farm 2015 to 2017

Results

24 cattle for 28 days – 1.24kg/DLWG

22 cattle for 21 days – 1.19kg/DLWG

49 days rotational grazed av. 9.5 cattle/ha

Comparative group of cattle doing 1.15 DLWG then 1.08 for same period on grass.

DLF Growmore

- Highly palatable and nutritious
- More tolerant of lower pH
- TONIC plantain – the best variety
- No chicory
- MUST be rotationally grazed
- 15 to 18 days rest in mid summer
- Big Live Weight Gains
- Very high in protein
- Contains ASPECT the highly palatable late perennial ryegrass

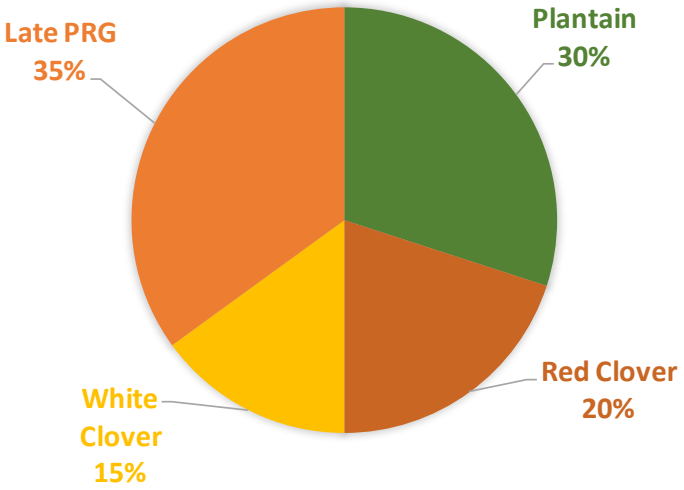
- Sow at 8 kg/acre 20 kg/ha
- 20 kg bags

Hamish Dykes South Slipperfield West Linton – 950 ft

HF Growmore 22nd August 2018

600 lambs on 4 x 5 acre blocks – 20 acre field

DLF Growmore



%	VARIETY	SPECIES	GROUP
30	TONIC	PLANTAIN	
20	RED CLOVER BLEND	RED CLOVER	
15	HF GRAZING PURPOSE CLOVER BLEND	WHITE CLOVER	
35	ASPECT	LATE PRG	TET

Sow at 8 kg/acre
20 kg/ha
20 kg bags

£7.80/kg to farmer

Lucerne for northern UK

- The best results with LUCERNE are achieved in Scotland when…
  - Free draining soil
  - Good pH status
  - It is not damaged too much by traffic or hard grazing
  - The 1st cut in the establishment year is often a “weed control” silage

- Drill at 8 to 10 kg/acre of inoculated seed, broadcast a little more (10°C min)
- Harvest at mid to late bud and then every 40 days
- Expect about 16 tonnes fresh/acre (3.4 tonnes DM/acre)
- 16 to 18% protein; 10.5 ME
- Supposed to last 5 years – in reality about 3 ½ years

Forage Rape

- Very fast growing
- More tolerant of low fertility
- Wide spectrum of use
  - Spring sow for mid summer
  - June/ early August for autumn
- Highly palatable
- Suits both sheep and cattle
- Superb for finishing lambs
- Sow mid June to mid July
- Drill at 2.5 kg/acre
- Broadcast at 4 - 5 kg/acre
- Some varieties can be flea beetle treated

Stubble Turnips

- Palatable and digestible
- Can be utilised 10 to 12 weeks after sowing
- Cattle or sheep
- Bulb or leafy type
- Not winter hardy
- Sow mid July to mid August
- Sow after winter barley
- Or after 2nd cut silage
- Drill at 2 kg/acre
- Broadcast at 3 kg/acre

Avalon Leafy Turnip

- Very high early vigour – covers the ground quickly
- 1.2 to 3 kg/acre
- 50 kg/ha N 15 kg/ha P and K
- Good winter hardiness and alternaria resistance
- Tap or “pen” root – not a bulb
- Very leafy and can be grazed from 6 weeks

- Where it has been sown in Scotland in autumn 2016 it has been superb

Kale

- A leafy, high yielding brassica
- Can be used right through both autumn and winter
- High protein and palatable
- Cattle and sheep can use it
- Sow mid May to June
- Needs good conditions
  - pH, phosphate & nitrogen
- Drill at 2 kg/acre
- Broadcast at 3 kg/acre
- Can be flea beetle treated

A good crop of Maris Kestrel
Berwickshire September 2014

Hybrid Brassicas

Spitfire
Digestible Stems

Zoom
Multiple Harvests

Swedes

- Full season crop
- Tolerant of most frosts
- High yielding
- Generally fed in situ
- Can be lifted and stored
- High dry matter for longer life
- pH sensitive
- They “clean” the ground
- Drill end April and May
- Very low sowing rates
  - 125 to 300 grams/acre precision
  - 1 to 2 kg/acre with grain drill
- All flea beetle treated

Fodder Beet – can they be grown in Scotland?

1000 tonnes off 25 acres
EnnerMax Beet
Kelso Nov 2015

Huge yields
High ME
Can be stored or fed in situ
Lift from Oct to Feb

Weed control is CRITICAL!!

BANGOR Grazing Fodder Beet

- 20.7 Tonnes DM/hectare
- 110 tonnes/ha + fresh wt.
- 4 to 5 Tonnes DM also in tops
- 17.7% Dry Matter
- 80% sits out of the ground
- Clean (3.3% dirt)
- Yellow
- Best Grazing fodder beet
- 10% Yield advantage over Kyros

- £70.00 per 50,000 seed pack (approx. 1 acre)

Monro Fodder Beet

- New Grazing Beet
- 60% sits out of the ground
- Low Dry matter for grazing
- High Fresh Yields
- A replacement for Feldherr

Monro is the BIG Red one

Outstanding performance

Elsoms and French plant breeding company, Florimond Desprez, continue to test and develop new varieties of Fodder Beet through their extensive breeding and trialling programme in Lincolnshire and Northern France.

Trial Results

Category	Variety	Dry Matter Yield %	Dry Matter Content %	Fresh Beet Yield %	% Root in Ground
High Dry Matter	Viridis (Rhz)	102.1	18.6	103	70
	Cagnotte (Rhz)	99.7	17.5	107	65
	Blizzard®	98.4	18.3	100	72
All Rounder	Splendide	98	16	113	70
Medium Dry Matter	Jamon	96.8	15.8	117	65
	Merveille	96.4	16.7	105	70
Low Dry Matter	Monro	90	14.6	117	40

Data from NIAB 2001 Descriptive List and ADBFM French Trial Results 2014-2016

Ecological Focus Areas – Opportunities in 2018

- **Fallow Land** EFAFAL Not used from 15th January to 15th July, inclusively
  - Sow a late heading grass mixture specifically for cutting in mid July
  - 2017 15 Tonnes/hectare silage at 11.2 ME and 14 Protein (Fans, Earlston)

- **Margins** EFAM May be cut for hay or silage, after 15th July
  - May also be grazed after 15th July if not beside or containing a watercourse

- **Catch Crop** EFACC Undersow a spring cereal crop
  - Use a full grass mixture if leaving the field in grass for longer
  - Use an Italian Catch Crop Mixture at 3 to 4 kg/acre

- **Green Cover** EFAGC Improve the organic matter and physical conditions of a soil
  - Mixtures with vetches, forage rye, phacelia, mustard, red and white clover, radishes