An Introduction to Grassland Management

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DLF Seeds Scotland

Thainstone
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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, 15 to 20 p/kg (£125 del + costs)

- Grazed Grass is the cheapest way to feed ruminant animals

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

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

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

Key: D-value = measure of feed digestibility.
How does a grass plant grow?

Graph 1: The leaf life cycle of a grass plant

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

<table>
<thead>
<tr>
<th>Class of stock</th>
<th>Grazing period</th>
<th>Rotational grazing</th>
<th>Set stocking (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pre-graze (cm)</td>
<td>Post-graze (cm)</td>
</tr>
<tr>
<td>Ewes and lambs</td>
<td>Turn-out - May</td>
<td>8-10</td>
<td>4-5</td>
</tr>
<tr>
<td></td>
<td>May - weaning</td>
<td>8-10</td>
<td>4-6</td>
</tr>
<tr>
<td>Pre-tupping</td>
<td>Sep - Nov</td>
<td>8-10</td>
<td>4-5</td>
</tr>
<tr>
<td>Weaned finishing lamb</td>
<td>Jul - Sep</td>
<td>10-12</td>
<td>5-7</td>
</tr>
</tbody>
</table>
Grazing cattle

Benefits of Rotational Grazing

Table 4: Sward height targets for beef

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

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

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Annual yield (t DM/ha)</th>
<th>Utilisation (%)</th>
<th>Useable yield (t DM/ha)</th>
<th>Percentage Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set stocking</td>
<td>8.5</td>
<td>50</td>
<td>4.3</td>
<td></td>
</tr>
<tr>
<td>Rotational</td>
<td>10.2</td>
<td>65</td>
<td>6.6</td>
<td>56%</td>
</tr>
<tr>
<td>Paddock</td>
<td>10.2</td>
<td>80</td>
<td>8.2</td>
<td>92%</td>
</tr>
</tbody>
</table>

Rotational grazing and paddock grazing do not suit all farms or farmers
Scottish farmers very often want early growth, but without early seed heads.

Use early growing intermediate perennial ryegrasses - Seagoe (T) at 111%, Glenstal at 109% and Boyne at 109% for early growth in Scottish conditions.

For late season growth use the intermediate perennial ryegrasses - Seagoe 110% and Boyne 107%.

Or the late perennials we use like Alfonso with 109% of growth from 1st Sept and later.

The late Perennial Ryegrass variety ASTONCHIEFTAIN has an REE of 52.
This means its first seed heads aren’t seen until 22nd June.
It has 109% of early growth and 104% for late autumn growth.

Use SRUC recommended varieties.
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 waterlogging 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

ITALIAN RYGRASS

ADVANCED GRASSES
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)
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

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
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
- 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 4½ weeks prior to “Combining date” - cereals at soft cheese

- Improve your vermin controls

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**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
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

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Digestibility</td>
<td>60 - 70%</td>
</tr>
<tr>
<td>Dry Matter Yield</td>
<td>10 - 15 tonnes DM/ha (4 - 6 tonnes DM/acre)</td>
</tr>
<tr>
<td>Dry Matter</td>
<td>25 - 30%</td>
</tr>
<tr>
<td>Fresh Yield</td>
<td>40 - 60 tonnes/ha (16 - 25 tonnes/acre)</td>
</tr>
<tr>
<td>Crude Protein</td>
<td>15 - 20%</td>
</tr>
<tr>
<td>Energy (ME)</td>
<td>10.0 - 11.5 MJ/kg DM</td>
</tr>
</tbody>
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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
Sow at 8 kg/acre
20 kg/ha
20 kg bags
£7.45/kg to farmer

Sown 9th May 2017 at 10 kg/acre
Recommended sowing rate is 8 kg/acre
1st Graze 15th July
Photos and figures from Lorna Galloway, Agrii
Rapid Gain 2017 Trial

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.

Trial Figures from Robert Fleming
South Milton, Glenluce
Scotland’s Beef Farmer of the Year 2017

Agrii iForage Farm 2015 to 2017

DLF Growmore - new

- 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
**DLF Growmore**

<table>
<thead>
<tr>
<th>%</th>
<th>VARIETY</th>
<th>SPECIES</th>
<th>GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>TONIC</td>
<td>PLANTAIN</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>RED CLOVER</td>
<td>RED CLOVER BLEND</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>HF GRAZING</td>
<td>PURPOSE CLOVER BLEND</td>
<td>WHITE CLOVER</td>
</tr>
<tr>
<td>35</td>
<td>ASPECT</td>
<td>LATE PRG TET</td>
<td></td>
</tr>
</tbody>
</table>

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

£7.80/kg to farmer

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**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

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**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

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
  - 2016 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