Overseeding in high temperature differences

hot summers/ cold winters
Ways of keeping grass young

Renewing

- Sowing of high valuable species in a **ploughed** or **sprayed** paddock
- Higher sowing rates than overseeding
- Paddock is **periodically out of production**
- **Higher investment costs** than reseeding and overseeding
Ways of keeping grass young

Reseeding
- Improving existing sward by sowing higher valuable species
- Species do not occur in existing sward
- continuous production

Overseeding
- improving sward by sowing already existing species
- yearly repeated
- continuous production
No matter how good the grassland management is there will be a decline in output & an increase in weed species present over time.

From year one a decrease of 10 - 15% in yield is normal.

Coupled with that is a decline in forage quality.

Without doubt renewal with a new ley is the best option.

However, if this is neither possible or desirable, then Overseeding will solve many problems.
What happens to Grass swards over time?

Natural grass is capable of providing animal maintenance but very little animal output.
The Typical Reseeding Cycle vs. Regular Overseeding

Overseeding each year

Reseeding after 6 years

Years

Yield

0 20 40 60 80 100 120

1 2 3 5 6 7 8 9 10
Long term trial results from DLF
Overseeding each year

Overseeding Trial Yield Results Year 5

- Hybrid + PRG + White Clover
- PRG + White Clover
- Hybrid + Red Clover
- Italian
- Control

Tonnes DM/Ha

Extra yield worth around €1200/Ha
Is Sward Quality Affected?

In all cases quality is also improved leading to even higher animal output.
Overseeding pays

Average 2,33 ton extra DM/year

GrassMax Cut + RC @ 30%

Un-scarified Control
Advantages of regular overseeding

- Increased yield
- Higher feed quality (protein, sugar, digestibility)
- More valuable species - new varieties
- Suppressing weeds
- More dense sward
- Paddocks are continuously full in production (productive 1st cut)
- Lower emissions and C-losses
Overseeding – How?
Introduction to germination

Needed for germination

- Viable non-dormant seed
- Water
- Oxygen
- Temperature
- (Acidity (pH))
- (Salt level)
- (Light)

For all aspects: Minimum and maximum thresholds
Establishment

- Sowing at the right time
- Ensure moisture for germination!
- Surface sowing + rolling is preferred
- Soil cultivation must ensure moisture in the topsoil
- Available nitrogen in the upper soil
- Difficult weeds must be controlled
- Max. 6-7 cm high grass before winter - eventually light cutting
- Use cover crop - barley, oats
Winter: Winters are colder in Northern Bulgaria and much milder in the Southern part of the country. Winter temperatures vary between 0°C and 7°C below zero. Very rarely temperatures may drop below 20°C below zero.

Spring: The spring climate is typical continental and changeable.

Summer: Summer is hot and sweltering in Northern Bulgaria, especially along the Danube River. The climate in Southern Bulgaria is determined by the air-currents from the Mediterranean. Summer temperatures do not reach the extremes as in Dobroudzha and along the Danube and are usually moderate: about 28°C-30°C.
Seeding in low temperatures

<table>
<thead>
<tr>
<th>Species</th>
<th>AVG % of check</th>
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<tbody>
<tr>
<td>DACTYLIS...</td>
<td>60</td>
</tr>
<tr>
<td>PHLEUM...</td>
<td>70</td>
</tr>
<tr>
<td>FESTUCA...</td>
<td>38</td>
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<tr>
<td>FESTUCA...</td>
<td>27</td>
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<tr>
<td>FESTULOLUM...</td>
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<tr>
<td>FESTULOLUM...</td>
<td>145</td>
</tr>
<tr>
<td>LOULUM PERENN</td>
<td>96</td>
</tr>
<tr>
<td>LOULUM X...</td>
<td>127</td>
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<tr>
<td>LOULUM...</td>
<td>148</td>
</tr>
<tr>
<td>LOULUM...</td>
<td>153</td>
</tr>
</tbody>
</table>
Low temperature germination and emergence - average per (sub)species

<table>
<thead>
<tr>
<th>Species</th>
<th># samples</th>
<th>14 das</th>
<th>21 das</th>
<th>Max Germ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lm-Ww</td>
<td>9</td>
<td>70</td>
<td>90</td>
<td>92</td>
</tr>
<tr>
<td>Lm-Lt</td>
<td>6</td>
<td>41</td>
<td>87</td>
<td>95</td>
</tr>
<tr>
<td>Lol-Interm</td>
<td>1</td>
<td>29</td>
<td>67</td>
<td>87</td>
</tr>
<tr>
<td>Lp-4n</td>
<td>6</td>
<td>24</td>
<td>61</td>
<td>94</td>
</tr>
<tr>
<td>Lp-2n</td>
<td>41</td>
<td>23</td>
<td>60</td>
<td>93</td>
</tr>
</tbody>
</table>

- das = days after sowing

Conclusions

Huge variation between species

Huge variation between varieties of one species
Different mixtures – different purposes

More than 10 different species are used for composing the ForageMax® mixtures. The idea is to create the basis for a production of high quality forage without losing persistency and stress tolerance. In order to obtain this, each ForageMax® mixture consists of 2-7 different species, which are all chosen according to the intended use of the field.

The main species for obtaining high forage quality – and always represented by the best varieties from our breeding – are perennial ryegrass, festuca and hybrid ryegrass combined with red or white clover or alfalfa. In order to ensure good stress tolerance and maximum persistency, some mixtures are supported by timothy, cocksfoot, meadow fescue and tall fescue.

Not all species are suited for re-/over seeding
Lucerne + grasses improves quality

• **Protein content**
  - Lucerne has 18-20 % protein in DM, grasses 10-12 %
  - Mixing grass and lucerne increases the protein content by 1-5 % points

• **Sugar content**
  - Polim and Tabrom have the highest level of sugar in DM, Daisy and Donata the lowest
  - Mixtures of lucerne and grasses have sugar contents in-between the two mixing partners

• **NDF content**
  - Lucerne has a much lower NDF content than grasses
  - Donata has higher NDF content than the other grasses,
  - Polim and Tabrom have lower content
Influence of old sward density

A successful establishment depends on old sward density and the competitive ability of the species.

Low grass biomass at sowing resulted in significant higher white clover seedlings density.

Relationship between white clover seedling density and grass biomass at sowing (Schlueter, 2011)
Grass development in field

*Daily growth of clover and grass, grazing Kg dry matter per hectare per day.*
Timing: Early spring/spring

**Pro**
- Makes use of winter moisture in soil
- Overseeding corresponds well in time with grassland maintenance after winter
- Gives an improved field for use the full season

**Contra**
- Risk of spring drought in some regions
- Too high sward height after a mild winter
- Large competition with already existing species
- No quality and yield advantage in 1st cut
Timing: Summer/late summer

**Pro**
- High soil temperature
- Fastest germination
- Good establishment of legumes
- More open sward
- Improved quality of the last cut
- High yield in 1st cut in following year

**Contra**
- Risk of dry period
- Busy period on the farm
Timing: Autumn

**Pro**
- Safe establishment in the short sward after last silage cut or grazing
- Limited competition from weeds and other species
- High moisture availability
- Possibility for grazing until winter

**Contra**
- Lower temperatures than in summer
- Slower germination rate
- Crucial or too late for establishing legumes
Timing

The main reasons for choosing the right sowing window with regard to enabling a good germination rate are:

- soil moisture
- soil temperature
Threshold levels

<table>
<thead>
<tr>
<th>Ground cover</th>
<th>Sown species</th>
<th>Weed content</th>
<th>Clover content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 50%</td>
<td>Below 50%</td>
<td>Over 50%</td>
<td>Below 10%</td>
</tr>
<tr>
<td>50-60%</td>
<td>50-60%</td>
<td>30-50%</td>
<td>10-20%</td>
</tr>
<tr>
<td>60-75%</td>
<td>60-70%</td>
<td>20-30%</td>
<td>20-40%</td>
</tr>
<tr>
<td>75-85%</td>
<td>70-90%</td>
<td>10-20%</td>
<td>40-60%</td>
</tr>
<tr>
<td>85-95%</td>
<td>Over 90%</td>
<td>Below 10%</td>
<td>Over 60%</td>
</tr>
<tr>
<td>Over 95%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The field should be renewed as soon as possible

Overseeding/Reseeding should be taken to improve performance

A good field
Guidelines

- Re-/Overseed in a short sward (<5 cm) with good moisture content
- Achieve an open sward by harrowing before overseeding
- Use a smooth roller or graze the paddock with cattle to get seed to soil contact
- Continue grazing until seedlings start to emerge - then remove animals
- Good levels of P, K and lime are important for legume establishment
- Do not apply nitrogen - this will increase competition from existing plants
- Choose the most suitable technique
  - Sowing with special equipment or disk driller
  - Tine harrow with seeding equipment
  - Slurry seeding
Overseeding

Challenges
• Survival of seedlings
• Time of germination
• pH
• Nutrients (NPK+ lime) and water availability

Technique
• Drilling slots
• Spraying/weed control before overseeding in spring

Reasons
• Increasing quality
• Higher protein content
• Yield
• More valuable species
• Suppressing weeds or rough meadow grass
• Grass is more responsive to fertilizer
• Field is continuously full in production

Timing
• Autumn (lower soil temperature)
• Early spring (more stable temperatures, minimum competition, damp soil)

Species
• Persistence
• Feed value
• Spreading over rhizomes or vegetative tillering

Other aspects
• Soil type
• Rainfall
• Natural clover
• Sward density
• Economic loss without overseeding
• No cutting in first year after overseeding, better grazing

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