



# TURNING OLD INTO NEW

## Reseeding to improve grassland yields and quality

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If unwanted grasses and weeds have increased to cover 40 to 50 % of a patch of grassland, reseedling is recommended. Many farm managers are wrongly put off by the relatively high investment of between 350 and 500 Euros per hectare, depending on the method. But these investments quickly turn to profit through considerably higher yields and qualities, which in turn lead to higher milk yields.

### Reseeding – not a question of age

The development of grassland crops with increasing amounts of unproductive and low quality varieties is often caused through mistakes in management, such as insufficient care and usage measures, or through damage caused by drought or mice. If the turf is still intact and productive, and has a high amount of valuable fodder grasses, clover and “valuable” herbs in certain proportions, there is no compelling need to reseed. The decision regarding whether a grassland area is to be reseeded should be taken first and foremost by looking at the performance and the composition of the turf, and also to a lesser extent by looking at its age.

There is a greater tendency in northern Germany and the Netherlands to replace grassland at more or less regular intervals than in the south of Germany or the low mountain range areas. Reseeding is often difficult to carry out particularly in the fully grassland areas of the low mountain ranges with their partly steep inclines, shallow stony soils, or with stagnant moisture or wetness due to wells. Farms that reseed grassland regularly every 5 to 8 years, want to utilise the performance and quality increase associated with reseedling, particularly in the first three years. Generally, this is measurable as a higher basic ration performance in milk production. Many farms in northern Germany or the Netherlands have developed a type of grassland

management in suitable areas, which is close to multi-annual forage growing or temporary grassland. This represents intense use and management which at the same time guarantees very high area productivity. If the grassland is always too cut early, the endurance and with it performance and ability to compete drop throughout the course of the years. Here, the high mechanical load on the turf through frequent passages and the management mistakes already mentioned lead to the continuing breakthrough of further unwanted varieties.

The economic threshold for reseedling grassland is, according to general recommendations, a composition with 40–50 % of unwanted, unproductive



The performance potential of grassland can be improved by reseedling.



The economical threshold for reseeding grassland is a composition with > 50 % unwanted unproductive grasses such as rough meadow grass or meadow soft grass.



**Rough meadow grass**



**Meadow soft grass**



**Meadow foxtail**

**Tab.1: Comparison of the feed value of grass silages of comparable physiological ripeness from different qualities of grassland crops**

Grassland variety	Raw fibre content % in DM	Digestibility %	Energy content MJ NEL/kg DM
Reseeding	23,2	85,5	6,74
Old turf	23,9	76,2	5,75

Source: Digestibility trial LLG Iden and CAU Kiel, 2002

grasses, such as annual bluegrass, rough meadow grass, wheat grass or meadow soft grass. Meadow foxtail, which can be found commonly on fresh to damp soils, heavy soils or moorland, also does not fit into the idea of a performance-oriented grassland crop. In practice, high percentages of these very early ripening and inflexible grass varieties lead to obvious losses in quality. Even when applying the normal mechanical management methods such as grooming and replanting, a positive development of the grassland cannot be expected. Here, only reseeding can bring a return to profitability. However, it must be noted that reseeding cannot replace good grassland management.

## Utilise breeding progress

As highlighted by the example in Table 1, there can be enormous differences in the digestibility and energy content between old grassland with a high percentage of undesirable varieties and a reseeded area with approximately comparable physiological ripeness. A ten per cent higher or lower digestibility, and an energy value greater or less than 1 MJ NEL/kg DM can decide whether basic feed production is economical or not.

Continuous improvements in the number of quality and value determining properties and in the yield potential of grasses are mainly due to progress in breeding.

Besides the improvement in yield and quality that new and modern varieties bring, they also have

made advances in terms of disease resistance and endurance, such as winter hardness, competitive strength or suitability for moor lands. These are characteristics, which have great importance for securing yield and quality. But only appropriate use and nutrient supply, and optimised maintenance can sufficiently develop the high breeding potential of the varieties.

## Grow qualitatively and quantitatively on the plots

Farm growth is limited due to the decreasing plot availability and increasing costs per plot, as well as the restrictions in the number of animals due to the fertiliser ordinance. This means it necessary to realise maximum qualitative and quantitative growth on the available area. There is an economic difference in whether you produce basic feed with 2,500 or over 5,000 kg milk per cow per year, or if a mere 6,000 kg or over 12,000 kg milk are produced per hectare of grassland. Many dairy farms

still have large reserves, which can be realised by selecting a suitable mix and optimised production technology. The effect of an improved performance potential of newly seeded grassland on milk yield potential is depicted by the model calculation in Table 2.

If the potentials from the model calculation (Table 2) can be realised by reseeding, it would result in an extra yield of approximately 6,600 kg of milk per hectare per year over an economic lifespan of six years. When taking into consideration the costs for reseeding and the higher costs for requirement-oriented fertilisation, a financial gain of approx. 2,000 €/ha per year results from reseeding. This means that successful reseeding results in a fast multiple return on investment through increased yields (grass and milk).

## The right varieties bring success

Primarily important is a suitable seed mix, which should be selected according to use and the situation or region. Only in this way can the full potential of advanced breeding be utilised. Not least, highly productive new seeds can improve the nutrient efficiency of grassland.

## The problem of the right time to plough

Ploughing up for grassland maintenance offers

**Tab. 2: Comparison of old grassland with a reseed fertilized according to requirement**

7,000	kg/ha DM yield (– 10 % losses)	x 5.4 MJ NEL	= 34.020 MJ NEL	= 5,804 kg milk/ha
10,500	kg/ha DM yield (– 10 % losses)	x 6.4 MJ NEL	= 60,480 MJ NEL	= 10.765 kg milk/ha
Difference 6,597 kg milk x 6 years usable period of the reseeded turf				
<b>Additional yield = 39,582 kg milk x 0.3 €/kg milk = 11,875 €/ha or 1,979 €/year</b>				
Cost of reseeding approx. 1,350 €(incl. Increased fertilisation and harvesting costs)				
<b>Relation effect : Yield = 1 : 9</b>				
Energy requirement: 3.17 MJ NEL per kg milk				

Source: according to Galler, Landwirtschaftskammer Österreich, 2010, altered



itself in principle for late summer mid-August to mid-September. This has the following advantages:

- The first high yielding growth of the old turf can be fully used.
- The establishment possibility in autumn is higher than for spring seeding, at the same time, the risk of weed infestation is lower in autumn.
- The ground can settle during the autumn and winter months.
- The first growth in spring already delivers nearly full yield at highest potential quality.

However, ploughing up grassland can mean the release of considerable amounts of nitrogen, which exceed the nitrogen requirements of the reseeded during the autumn months. This can lead to an increased risk of nitrate leaching into the ground water. Direct sowing procedures can considerably reduce the nitrate-leaching potential. Where ground water protection has high priority, grassland ploughing should be performed in early spring.

## Conclusion

If a grassland crop has 40–50 per cent undesirable and unproductive grasses and weeds, then

## Grassland renewal scheme with killing of the old turf

Step	Specifics	Time point	with herbicide	with cultivator
I. Killing the old turf	dry areas	late autumn	preferred	necessary (also after herbicide application)
	down trodden turf	spring to late summer		
	high precipitation	late summer	preferred	
II. Reseeding	dry areas	early spring	Special harrow seeder*	Stone burier or cultivator with driller or rotary tiller – driller combination (very shallow working)
	down trodden turf	2–3 weeks after killing possible)	(possible)	
	high precipitation areas	2–3 weeks after killing and removal of the dying plant material	Special harrow seeder*	
III. Weed control	Mulch cut at 10–15 cm growth height of the reseeded crop if necessary. If necessary further mulch cuts when weeds are stronger, or selectively use herbicides. No liquid manure fertilisation in the first years. If possible, timely grazing as soon as the turf is bearing.			

\*(Köckerling, Vredo) Source: according to Hartmann, LfL Bayern, 2014, altered.




traditional measures for crop improvement, for example through concurrent replanting are generally not useful. Here only complete reseeded with a quality mix can restore the cost-effectiveness of the grassland for fodder production. The assumed high costs and risks of reseeded are many times lower from an economic point of view than the unexploited potential of a poorly devel-

oped turf. As one thing is sure: A good basic feed is expensive, but a poor feed costs much more.



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## Reseeding procedure (ploughing, stone burial, direct sowing)

Reseeding procedure	Advantages	Disadvantage
<b>Plough seeding with rotary tiller / driller with killing of the old turf</b> 	<ul style="list-style-type: none"> <li>• Clean weed-free seed bed</li> <li>• No hindrance from roots bales from the old turf</li> <li>• Fine textured seed bed can be prepared</li> <li>• Soil warms up quickly, fast emergence</li> <li>• Uniform seed deposition possible when sufficiently recompacted</li> <li>• At the same time pest control of mice and other pests</li> </ul>	<ul style="list-style-type: none"> <li>• High work effort and cost expenditure</li> <li>• Danger of erosion in slopes and silting</li> <li>• High potential of N-use with danger of increased N-displacement</li> <li>• Difficult on shallow, stony grounds and on slopes</li> <li>• Increased danger of weed infestation after seeding</li> <li>• Longer waiting time until sufficient load bearing capacity for the tractor or grazing is reached</li> </ul>
<b>Stone burier with killing the old turf</b> 	<ul style="list-style-type: none"> <li>• Relatively low amount of work required, ideally only one process (possibly two work steps required when opening the old turf)</li> <li>• Broadcast sowing, therefore good distribution of the seeds, leads to a quick and thick turf formation</li> <li>• Good seed deposition with good soil contact</li> <li>• Comparatively little humus loss and N-mineralisation</li> <li>• Stones, soil clods and grass sods are simply dug in</li> <li>• At the same time pest control of mice and other pests</li> </ul>	<ul style="list-style-type: none"> <li>• Relatively low impact force</li> <li>• Low availability of this technology</li> <li>• High power requirement for the tractor</li> <li>• Soil must be absolutely dry, otherwise quick blockage of the pressure roller and the tiller box</li> <li>• High wear, mainly if there are many stones</li> <li>• Difficult on stony ground</li> <li>• Increased danger of weed infestation after seeding</li> </ul>
<b>Direct seeding killing the old turf</b> 	<ul style="list-style-type: none"> <li>• Low work effort, cost expenditure and energy consumption</li> <li>• High impact though direct seeding technique</li> <li>• Maximum erosion protection</li> <li>• Lowest possible N-mineralisation when moving the old turf</li> <li>• Low CO<sub>2</sub>- and N<sub>2</sub>O gas release</li> <li>• Low danger of weed infestation</li> <li>• No limit for use in shallow and stony soils</li> <li>• Unimpaired load bearing capacity of the turf</li> </ul>	<ul style="list-style-type: none"> <li>• Delayed and possibly irregular emergence of the aftersow, especially in dry periods</li> <li>• Possibly certain weeds are not sufficiently killed off by glyphosate e.g. creeping buttercup, horsetail, ground elder etc.)</li> <li>• Possibility that glyphosate is not fully broken down and acts damaging to the seed / inhibits the seeds</li> </ul>