Future metrics for pasture production and utilisation on dairy farms

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Summary

- Grazed grass remains the cheapest high quality feed that can be offered dairy cows. Achieving grazing targets will ensure that grazed grass intake is maximised in the diet.
- Current grazing metrics are achievable on farms when stocking rate is appropriate for farm pasture production.
- Grass and feed budgeting will allow farms to tailor grazing targets to individual farm conditions and will provide confidence around achieving grass targets.
- Silage of high quality should be budgeted for the spring and supplemented in February as dictated by the farm feed budget and spring rotation plan
- Stocking rates on farms should be set based on whole farm pasture growth in order for the farm system to be financially robust and self-sufficient for feed.
- Grass clover swards have a major role to play in maintaining annual herbage production and farm productivity in lower N scenarios.

Introduction

After difficult prolonged periods during the past two grazing years in many areas of the country, many farmers are wondering whether the standard grazing targets are appropriate and achievable on farm within the context of a changing climate. With climate change predictions, it is likely that we will experience increasing numbers of either prolonged rainfall or drought-like events. Dairy farmers will need to be able to insulate their systems to these events and create resilient grazing systems that still allow high levels of grazed grass utilisation. At the same time, we must ensure that the overall system remains robust by building and retaining forage buffers on the farm in the form of grass silage. Grazed grass and clover swards are still the cheapest high-quality feed source available in our grazing systems; indeed the cost gap between grazed grass and grass silage or purchased concentrate has increased over the past number of years due to increased fuel and feed prices, and rising contractor charges.

Since the abolition of dairy quotas, and the expansion of the national dairy herd, farmers have taken the opportunity to increase farm productivity per hectare. One way in which farmers have achieved this is through increased stocking rates on farm and in particular on milking platforms. At the same time, there has been a downward trend in pasture production measured on farms since 2019 (PastureBase Ireland). This has occurred where feed demand at the animal level has actually increased as there has been a significant increase in milk yield per cow in the form of increased milk volume yields coupled with increases in fat and protein percentages. This has led to high pressures on our grazing systems at particular times of the year when grass growth can no longer meet the high daily pasture demand set by stocking rates. With an increasing number of challenging weather events, either from excessive rain or prolonged dry periods, farmers are forced to supplement grazed grass at a higher frequency, for more prolonged periods, and with greater levels of supplementary feed. The question asked by some are around whether the grazing targets are still achievable in our changing climate in 2024 and beyond?

Total annual herbage production

How have you decided your stocking rate for your farm? National farm survey figures show that for 2023 stocking rate was static at 2.13 LU/ha for dairy farms in Ireland. To be self-sufficient in terms of herbage production for this whole farm stocking rate, the farm needs to be capable of growing 12 to 14 tonnes of DM production based on current concentrate feed levels and national average milk yields. When stocking rate is not decided based on a farms potential to grow grass, cow performance suffers as potential animal dry matter intakes will not be achieved.

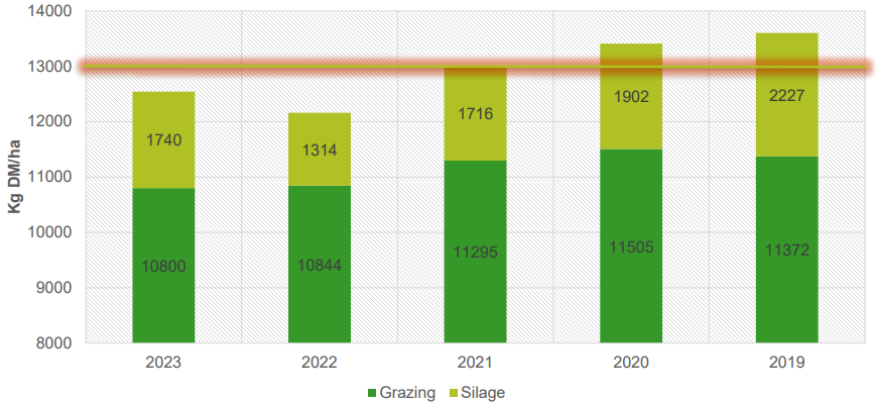

Figure 1. *Total herbage production of farms recording minimum 30 covers across Ireland on PastureBase Ireland (2019-2023).*

Regardless of soil type and location, farms should be targeting the maximum days at grass possible, and managing cow intake at grass in order to achieve good animal performance and high grass utilisation. In order to achieve this, a total feed budget should be carried out for the farm to allow the farm stocking rate to be matched to grass supply and to allow for planning around feed requirements at different points in the grazing season. This should be followed by a spring and autumn feed budget to facilitate the management of the feed deficits in the shoulders. This allows better decisions to be made for the farm, thus facilitating individual grazing targets to be met. Current grazing targets are still achievable on farms and the principles behind why the targets are there are still very important to our grazing systems. However, some stocking rates are not allowing farms to be self-sufficient in terms of what they can support within their farm gate. This has led to higher levels of off farm supplementation being required. It also creates pressure during the mid-season when we see the greatest fluctuations in grass growth. It creates a situation where there is increased days during the grazing season when supplement must be fed.

Table 1. Whole farm herbage production stocking rate (SR) budget based on national average milk yields for 2023 of 431 kg of milk solids per cow

Level of concentrate supplement (kg/cow)	Grass allocation DM/cow/per day	Grass grown required (tonnes)	10 tonne grown (SR)	12 tonne grown (SR)	14 tonne grown (SR)	16 tonne grown (SR)
600	16	6.4	1.6	1.9	2.2	2.5
1000	14	5.8	1.7	2.1	2.4	2.7

Autumn targets

As silage area comes back into the grazing platform after first and second cut silage crops, stocking rates will decrease for the grazing platform. This will help with building autumn covers for the final rotation to maximise grazed grass intake for the remainder of the grazing season. Peak average farm cover should be targeted at approximately 1,000 to 1,100 kg DM/ha based on a feed budget carried out to suit each farm. Farms that are still stocked at >3.5 LU/ha in the August September period will struggle to build farm cover as growth at this time of year will not be greater than demand as seen in Figure 4 below. Some farms on very heavy soil types that struggle to keep cows out full time in October and November, can build to a somewhat lower peak cover in September (900-1000kg DM per ha). However, it is still important to try to extend grazing into November period; and for spring grass to the 60:40 rule where possible.

The main points we need to keep in mind with our autumn grazing are as follows:

- Autumn closing rotation is the beginning of the next grazing season
- What you do in the last rotation will influence spring grazing decisions
- Depending on milking platform stocking rate you may need to start building farm cover from the beginning of August (SR >3 LU/ha)
- Build farm cover to a level that you are comfortable with on your farm if grazing conditions turn unfavourable
- Letting peak autumn cover get too high may impact spring grass availability
- 60:40 rule – graze 60% area in October, 40% of area in November
- **Target 650-750 kg DM/ha AFC 1st of December**

Spring targets

Grazed grass is far more valuable to our cows as a feed source in the spring than the autumn for milk production. Cows will benefit far more from consuming grazed grass than silage to manage body condition score at this crucial time of year. Silage supplementation in February and early March has little effect on milk production at that point or for the remainder of the lactation. However, beyond this period there is significant impact of silage supplementation on milk production for the lactation. Therefore, your spring grazing targets should prioritise this. Opening at a cover of more than 1,000 kg DM/ha is important to ensure you will have enough grass for the first rotation. If opening cover is low, silage supplementation should be prioritised in the February period when it has proportionally less on milk production. Some level of silage supplementation is hard to avoid during the spring period. In terms of labour, it is also more efficient to supplement silage in the February period while the majority of cows are still calving than March. A silage budget should be carried out on farms as part of a feed budget and good quality (>75% DMD) silage should be reserved in the yard for this. Calving start date and compactness has a very large impact on the herd demand and the ability to meet the targets. Herds that calve too early will have a much higher demand and will result in big requirements for both forage and concentrate feed in the spring. Managing calving date should be included in the planning process for spring management.

- Open at AFC +1000 kg DM/ha
- 30% area grazed 1st March? +7 to 14 days depending on farm type
- 60% area grazed 17th March? +7 to 14 days depending on farm type
- Finish the first rotation by 7th – 10th of April? +7 to 14 days depending on farm type

Spring rotation planner

The spring rotation planner (SRP) has been used successfully on many farms over the last 20 years to get grazing started while setting up the farm for second rotation. In recent years, many farmers have questioned its usefulness due to erratic spring weather events. While spring weather has become more variable with more severe extremes, changes in stocking rate and calving pattern are also causing farmers to question the SRP. A key point here is to revisit the growth pattern of your farm (Grass reports - growth curve PBI) in spring and look for the date when you are on average hitting your demand comfortably. That is your end date on your SRP and can range from early April to early May depending on growth rates and demand. Getting this date right is the key to setting the farm and the cow up to capitalise on high quality grass in early summer. If you are not measuring grass yet a good way to identify if this is a problem on your farm is to review protein % on your co-op report in April and May. Where farmers tend to finish 1st rotation too early silage will have to be fed in April to hold rotation length. Where this is a regular occurrence, you will see protein % will stagnate in April and recover in May if grass is being well managed at that point. If the opposite is the case and first rotation is being finished too late protein will improve in April as grass will not be limiting but will stagnate in May as pre grazing yields get too high.

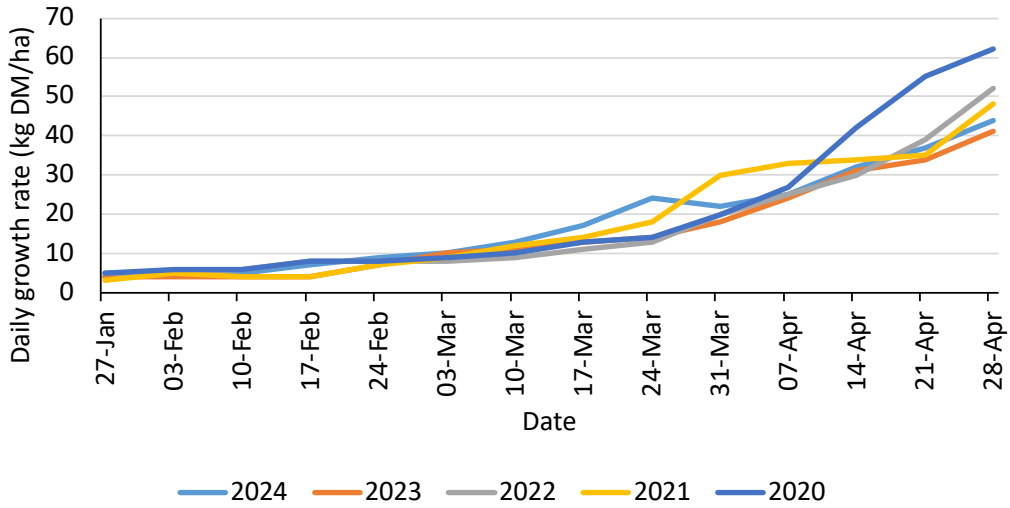

Figure 2. *Spring daily growth rate of farms recording minimum 30 covers across Ireland on PastureBase Ireland (2019-2023).*

While the SRP is the tool that will allow you to set up the second rotation on the farm, a grass budget (PBI farm management) will help you ensure that the cow is on a rising plane of nutrition while doing so. The key to success is making sure both work together in unison.

Spring grazing planning:

- Decide on magic day based on data not tradition
- Start with 600 AFC on that date in budget and work back
- If silage required front load it in first 6 weeks

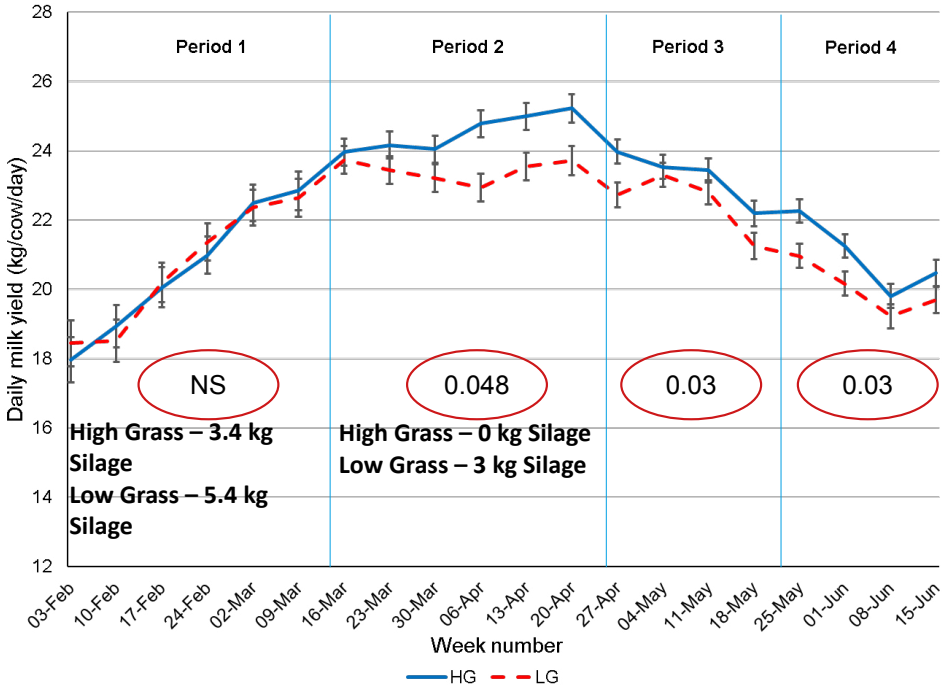

Figure 3. *Effect of timing and level of silage supplementation in the spring on daily milk yield*

Summer grazing targets

Mid-season stocking rate needs to be set at an appropriate level for farms based on average growth rate for the summer season and the requirement for the farm to produce forage for the winter period. This should be determined by grass demand. Demand is defined as SR x Grass allocation. For example, grass allocation of 18 kg DM/cow per day would be a demand of 18 multiplied by the stocking rate of 3 cows/ha is a mid-season demand of 54 kg DM/day. Setting demand at a higher level of over 60 kg DM/day reduces your opportunities to take out higher quality surpluses for silage; while these can be expensive they may be required in the diet to fill deficits that occur in the grazing season. Taking out pasture surpluses within rotation in response to high daily pasture growth will keep cows grazing the ideal pre-grazing cover of 1,400 kg DM/ha the majority of the time. This will further increase grass utilisation and productivity during the mid-season.

- 1400 kg DM/ha pre-grazing cover
- Demand and allocation sets stocking rate
- Take out surplus bales for high quality silage budget for following spring

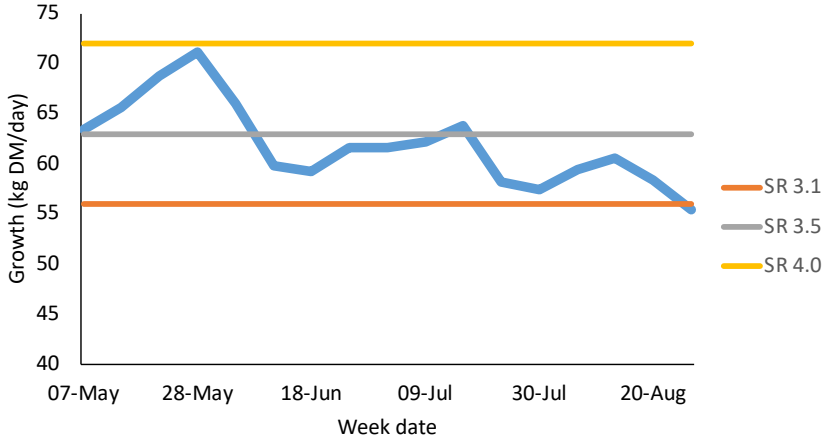

Figure 4. *Mid-season growth for farms recording minimum 30 covers across Ireland on PastureBase Ireland (2019-2023) with 3 demand lines based on stocking rate (SR).*

Clover- essential for pasture growth in a lower N environment

There has been much discussion on the future role of white clover in our grazing systems, particularly in light of declining annual pasture tonnage yields in recent years. Analysis of PBI and plot-level data would indicate that a contributor to lower herbage production has been reduced N application rates, often preceding or in the absence of clover in swards at farm level. Perennial ryegrass swards have a high nitrogen requirement; while perennial ryegrass/white clover systems can maintain pasture production and increasing animal performance at reduced chemical nitrogen applications in the system. With 20% white clover inclusion in perennial ryegrass swards, white clover can biologically fix up to 100 kg N/ha reducing the swards reliance on chemical nitrogen sources. White-clover perennial ryegrass systems can help further insulate our grazing systems due to their nature as lower cost systems with higher outputs (+30 kg MS/ha) through increased animal intake.