Nutrient Budgeting I
The benefits to your business
Practical Guide

Farming for a Better Climate

On both arable and grassland farms, careful consideration should be made when planning fertiliser applications for the growing year. Many farms apply the same fertiliser year after year without accounting for factors which affect the crop and soils fertiliser requirement.

Nutrient budgeting involves making informed decisions based upon a range of factors, all of which will affect the fertiliser requirement for the year. Careful nutrient budgeting can make financial savings and also reduce the risk of losing valuable nutrients to the environment. Factors including; crop type, crop offtake, previous crop, soil analysis, soil type and texture, organic manure analysis and rainfall all need to be considered when nutrient budgeting.

Significant financial savings can be made, especially if the farm has had a history of untargeted applications. If financial savings are not possible then nutrient budgeting can highlight where a fertiliser deficit has occurred and aim to rectify this by altering fertiliser practice. This can increase yield and output. per ha.

Targeted fertiliser use

PLANET software is a nutrient management decision support tool to help farmers and consultants with field level nutrient planning.

PLANET NUTRIENT MANAGEMENT

In order to reliably target fertiliser applications it is essential to know the soil status for individual fields through analysing your soil for pH, P, K & Mg.

If soils are high in phosphate (P_2O_5) or potash (K_2O) then savings in fertiliser applications can be made. It is worth noting that target status for phosphate and potash are dependant upon the crop in rotation. For phosphate, soil type dictates the soils capacity to bind with applied phosphate see SRUC Technical Note 668 "*Managing Soil Phosphorus*" for more information. By identifying soil status through analysis, management practices can be tailored to build soil reserves up where levels are low or reduce fertiliser inputs where soil status is high.

Our Practical Guides cover five useful topics:

1. Use energy and fuels efficiently
2. Renewable energy
3. Lock carbon into soils and vegetation
4. Making the best use of nutrients
5. Optimise livestock management

For more Practical Guides, Case Studies, information on our Focus Farms and ideas to benefit your farm, visit www.farmingforabetterclimate.org

Find us on Facebook and follow us on Twitter @SACFarm4Climate

Websites

www.farmingforabetterclimate.org

www.fas.scot/ (contains Technical Notes)

www.agrecalc.com

Getting the value out of organic manures

By carrying out a nutrient budget, you may be able to make further savings from better use of organic manures on the farm. By analysing organic manures, the nutrient value can be measured and targeted to crop need and soil analysis. Again it may be possible to **make significant savings to the farms spend on bagged phosphate and potash.**

By using PLANET for nutrient budgeting, it is very easy to see the effect that timing of organic manure application, methods of application and methods of incorporation can have on the availability of nitrogen. In short, the best practice is to apply organic manures in the spring to a growing crop with an application method targeting slurry as close to the plant as possible, i.e. trailing shoe or injection. Technical Note TN650 "*Optimising the application of bulky organic fertilisers*" illustrates the difference in availability of nitrogen in cattle FYM and slurry dependant upon timing, duration to incorporation (if applicable) and method of application. By applying cattle slurry to a growing crop there will be more nitrogen taken up by the crop and less lost to the environment.

The European Agricultural Fund for Rural Development: Europe investing in rural areas
Scottish Government Riaghaltas na h-Alba gov.scot
SAC CONSULTING
SRDP Farm Advisory Service

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Fertiliser savings - case study

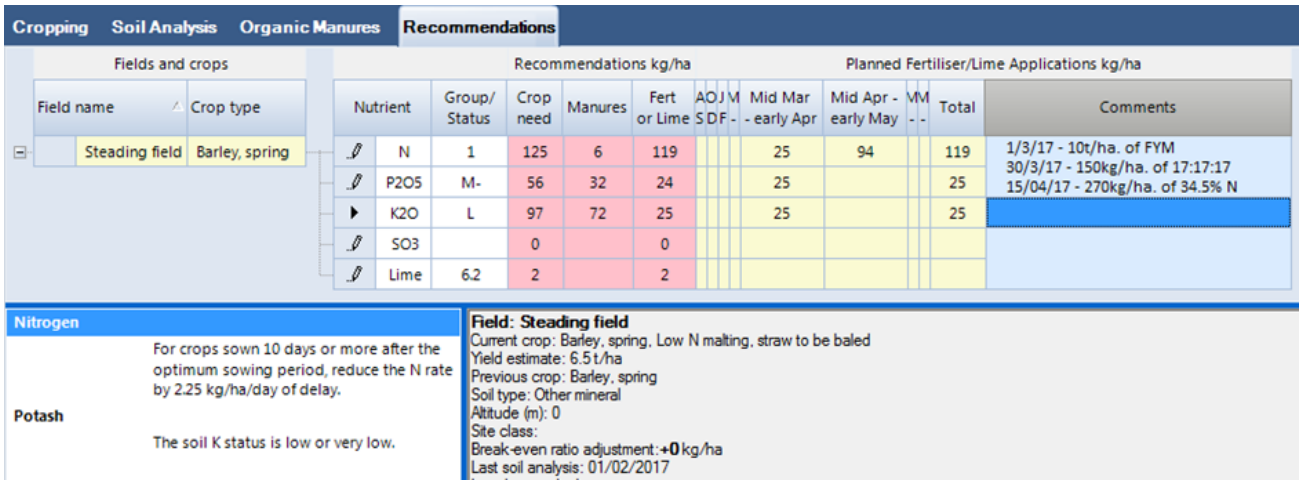
On a farm in south east Scotland, soil analyses were taken in early 2016 and the results allowed for considerable savings in fertiliser applications. Most of the fields were either on or above target for phosphate and above target for potash. The farmer counted the number of trailer loads of pit silage being removed from each field. From this, an estimation was made on the weight of each trailer accounting for the dimensions of the trailer and the dry matter of the silage. Knowing yield allowed a calculation of crop offtake for phosphate and potash and using field level soil analysis, an account was made for the soil status. The organic manures on the farm were also analysed giving an indication of the nutrient content.

Taking one field as an example, it analysed moderate plus for phosphate and high for potash. In 2016 there were two applications of slurry before each of the two cuts and 556kg/ha of 24:4:14 was applied. For second cut, 309kg/ha of 34.4N was applied. In comparison to 2017 where hen pen was applied pre first cut and slurry pre second cut, the nutrient budget calculation showed there was no requirement for any inorganic P & K. The only inorganic application was of bagged N where 346kg/ha of 34.4N was applied pre first cut and 309kg/ha pre second cut.

When nutrient budgeting it is important to make sure the crop offtake is being replaced, whether through managing high status soils, or through organic and inorganic applications. In 2016 the fertiliser cost was £1,948 on this field and in 2017 was £1,188 **resulting in a saving of £760 or £75.40/ha.** In order to continue to make savings whilst maintaining soil nutrient levels, a nutrient budget should be calculated for following years. Over the 12 fields (98.01ha) which the nutrient budget was calculated for a saving of £5,049 (£54.52/ha) was made. **In 2016 the total fertiliser cost including spreading was £15,636 and in 2017 this was reduced to £10,587.** This included a two cut silage system, spring barley and grazing.

Record keeping

As an added benefit of using software to create recommendations for fertilisers, many have the capacity to hold field records. Keeping fertiliser records is required for compliance under NVZ regulations but also for many crop assurance schemes. By using software to keep records it helps with fertiliser planning. For example if applying slightly more or less P or K in one year than is required, PLANET will carry this over to the following year by increasing or decreasing the starting balance. Therefor a running balance can quickly be observed by looking at individual fields and any over application, which leads to leaching and nutrient loss from your farm, can be avoided.



Other considerations

- It is critical to get pH correct
- Remediate drainage and compaction issues
- Add Organic Matter analysis to soil sample