Spring Nitrogen Advice

March 2015

Department for Environment Food & Rural Affairs

Summary

- Excess winter rainfall (EWR) data (up to 25th March 2015) indicates that the majority of the UK has experienced average rainfall this winter.
- Nitrate leaching losses are likely to be close to average over much of the country. Most farmers will not need to adjust their N use based on over-winter rainfall.
- The relatively cold spring means that the main N dressings may need to be slightly delayed compared to last year, but the principles of applying N are unchanged.
- Farmers in NVZs must plan their N use before any applications of N fertiliser or organic manures in the spring.

Excess winter rainfall

- Excess winter rainfall (EWR) is the amount of rainfall that drains through the soil leaching nitrate (and sulphate) that was present in the soil following harvest of last year's crop.
- Total EWR for winter 2014-15 has been close to the long term average over most of the country.
- Figure 1a shows the map of EWR up to 25th March 2015.
- For comparison, Figure 1b shows the 30 year average (1981-2010) EWR for the over winter period up to the end of March.

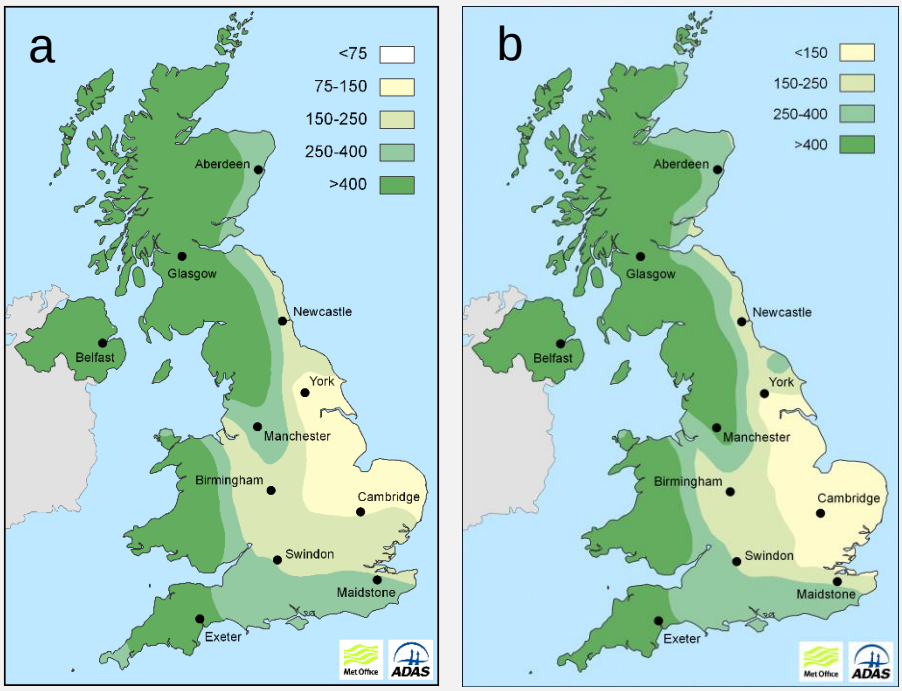

Figure 1. Excess winter rainfall: (a) up to 25th March 2015 and (b) long term average - up to end of March

Assessing spring soil nitrogen supply (SNS)

- SNS (i.e. soil mineral N + estimate of N in the crop + estimate of soil mineralisable N) can be assessed using the Field Assessment method described in the Fertiliser Manual (RB209) or by soil sampling and analysis.
- Most soil mineral N samples will now have been taken. Any last minute sampling should only be done where no N fertiliser or organic manures have been applied this spring.
- Spring SNS largely depends on the soil mineral N levels in autumn 2014, autumn crop N uptake and over-winter nitrate leaching losses.
- SNS may be higher than average where well established crops (i.e. oilseed rape) have taken up significant quantities of soil N.
- EWR data indicates that the majority of the UK has experienced average rainfall so far this winter, and therefore N leaching losses are likely to be close to average over much of the country.
- SNS is also influenced by soil type and past management of the field:
  - *Low SNS likely* – sand and shallow soils, no organic manures used, combinable crops.
  - *Moderate SNS likely* – medium or heavy textured soils following break crops or combinable crops receiving high N rates.
  - *High SNS likely* – medium or heavy textured soils receiving high and/or regular applications of organic manures.

Nitrogen for cereals

- Most winter cereals will already have received an early application of around 40 kg/ha N.
- Apply most of the remaining N requirement between early April and early May i.e. just before or during early stem extension.
- Review previous grain N/protein to judge if N use has been about right. Grain N at the economic optimum rate of N is about 1.9% N for feed wheat and 2.1% N for breadmaking wheat.
- Where grain N concentrations have been consistently above or below these values, N fertiliser use should be adjusted down or up by 30 kg/ha N per 0.1% difference in grain %N.
- Late applications of N (late May as fertiliser granules or June/July as a foliar spray) can increase grain protein for breadmaking wheat.

Nitrogen for oilseed rape

- The optimum Green Area Index (GAI) at flowering is 3.5. Each GAI contains about 50 kg/ha N. Visit www.totaloilseedcare.co.uk to estimate GAI from digital photos.
- Well established oilseed rape crops are likely to have taken up significant N by the start of spring growth and this should be accounted for in fertiliser N planning. A crop with a GAI of 1.5 in February would already contain 75 kg/ha of N.
- N fertiliser should generally be applied between early green bud and yellow bud. Where the N fertiliser requirement is more than 100 kg/ha this should be split into 2 or 3 applications.
- N fertiliser should be delayed for crops with large canopies of more than GAI 2 to reduce the chance of creating an over-large canopy and lodging.
- For crops with high yield potential an extra 30 kg/ha N per 0.5 t/ha expected yield increase above 3.5 t/ha (up to 4.5 t/ha) may be justified.

Nitrate Vulnerable Zone (NVZ) reminders

Farmers in NVZs must comply with the NVZ rules and keep records to demonstrate their compliance.

- You must plan all applications of N from fertiliser and organic manures. This plan must show you have calculated the:
  - Soil nitrogen supply
  - Economic optimum N rate
  - N supply from any organic materials
  - Fertiliser N requirement
- You must ensure that the average N application rate (from manufactured fertiliser and crop available N from applications of all organic materials) to specified crop types does not exceed the N max limit for that crop type.
- Full details of the NVZ rules can be found at www.gov.uk/nitrate-vulnerable-zones

Farmers in NVZs must plan their N use before any applications of fertiliser or organic materials

Phosphate, potash and sulphur

- Around 30% of sampled fields are at target index 2 for P and 30% are at target index 2- for K.
- Check soil P and K indices by soil analysis every 4 years and aim to keep soil at target indices.
- Target applications of organic materials (high in P and K) to fields with lower P/K indices. Avoid applying additional P or K in fertiliser or organic materials where soil is above target.
- Don't forget sulphur fertiliser. Where deficiency is expected, apply 25-50 kg/ha SO_3 to cereals, 50-75 kg/ha SO_3 to oilseed rape and 40 kg/ha SO_3 per cut to grass.

Nutrient management software

- PLANET can be used to help farmers with field level nutrient management decisions and to assess compliance with the NVZ regulations.
- MANNER-*NPK* can be used to assess the crop available nutrient supply from different organic material types.
- Download PLANET and MANNER-*NPK* for free from www.planet4farmers.co.uk

Acknowledgement

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