

Guidance for Farmers in Nitrate Vulnerable Zones

Planning nitrogen use

October 2008

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Website: www.defra.gov.uk/environment/water/quality/nitrate

Published by the Department for Environment, Food and Rural Affairs

The guidance in this series of leaflets is designed to help farmers be compliant with The Nitrate Pollution Prevention Regulations 2008 (SI2349 September 2008). The guidance has been produced in association with the Environment Agency, who is responsible for assessing farmers' compliance with these Regulations.

Planning nitrogen use

Part 4 of the Regulations establishes rules which require you to plan all applications of nitrogen to a crop (whether the nitrogen be present within manufactured nitrogen fertiliser, organic manure, or any other nitrogen-containing material).

It is important to balance the foreseeable nitrogen requirement of each crop (including grass) with the nitrogen supply from all sources (including from the soil, the mineralisation of reserves of organic matter in the soil, and applications of organic manures and manufactured nitrogen fertilisers).

A summary of the rules is given below.

YOU MUST:

- **Plan the use of nitrogen fertiliser, following a four step process**
- **Keep a record of your plan and record details of your actual nitrogen application(s).**

If you are in an NVZ originally designated in 1996 or 2002, you will need to comply with these rules from 1 January 2009. However, if you are in an NVZ newly designated by the 2008 Regulations, you have until 1 January 2010.

The boxes below set out the rules in more detail and the following paragraphs provide further explanation. A guide for producing the plan and a template for keeping the required records is provided at the back of this Leaflet.

1. Planning the use of nitrogen fertiliser

You should not supply more nitrogen to the crop (from applications of organic manure, manufactured nitrogen fertiliser and/or other nitrogen containing materials) than it needs. If you do, you will waste money and could cause pollution. Planning your applications will help you avoid this.

The Regulations require that you follow the following four steps when planning how much nitrogen fertiliser to apply to your crops (including grass).

YOU MUST plan all applications of nitrogen from organic manures and manufactured nitrogen fertilisers to each crop in each field. The plan MUST show that you have followed the following four steps:

- Step 1** Calculated the amount of nitrogen in the soil that is likely to be available for uptake by the crop during the growing season (the soil nitrogen supply);
- Step 2** Calculated the optimum amount of nitrogen that should be applied to the crop, taking into account the soil nitrogen supply (the crop nitrogen requirement);
- Step 3** Calculated the amount of nitrogen, from any planned applications of organic manure, that is likely to be available for crop uptake in the growing season in which it is spread (the crop available nitrogen); and
- Step 4** Calculated the amount of manufactured nitrogen fertiliser required.

Planning nitrogen use

You must complete Steps 1 and 2, and the related records:

- in the case of permanent grassland, each year beginning the 1 January before any nitrogen fertiliser (including manufactured nitrogen fertiliser and organic manure) is applied.
- in the case of any other crop (e.g. arable, temporary grass), before any nitrogen fertiliser (including manufactured nitrogen fertiliser and organic manure) is applied for the first time to a crop or to a field intended to be planted.

Steps 3 and 4, and the related records, must be completed before each application of organic manure or manufactured nitrogen fertiliser.

If you need to, you should modify your plan during the growing season. Whilst the Regulations only require that a plan is produced at the start of each year for permanent grass, it is recommended that you plan for each grass growth period (cutting or grazing).

To help with the production of your plan, a guide is provided at the back of this Leaflet (Annex 1). You may also wish to seek professional advice from a FACTS qualified adviser.

When planning your applications you will need to be aware of other rules established by the Regulations which may restrict how much nitrogen you can apply to the crop and also the timing of the applications. These are:

- An upper limit on the amount of nitrogen (from livestock manure and manufactured nitrogen fertiliser) that can be applied to specified crop types crops (see Leaflet 7 – the N max limit),
- a limit of 250 kg/ha of total N from all organic manures that are applied to land in any 12 month period (see Leaflet 8 – the organic manure N field limit), and
- restrictions on the timing of nitrogen applications (see Leaflets 8 and 9).

Whilst the Regulations only require that you plan your applications of nitrogen, it is recommended that you carry out a similar planning activity for applications of other nutrients, such as phosphorus. Industry guidance is available to help (see 'Further information' for details).

2. Keeping field and crop records

The Environment Agency will check your compliance with the rules described in this Leaflet by inspecting your field records and assessing whether you have completed each of the four 'planning' steps.

The Regulations require you to keep a number of records relating to each crop grown in each field.

For each crop in each field, YOU MUST keep the following records:

- your four-step plan;
- details of the actual applications of manufactured nitrogen fertiliser and organic manure;
- details of the crop grown; and
- a written copy of any advice received from a FACTS qualified adviser.

Note: A full description of the required records is provided in Annex 1.

You may already regularly produce a plan for nitrogen applications on your farm and keep records of your applications of organic manure and manufactured nitrogen fertiliser. If so, these records may be sufficient provided they are adapted to contain the relevant information required by the Regulations (see Annex 1).

Alternatively, you can use the template provided at the back of this Leaflet (Annex 2), or the PLANET software, for keeping some of the required records. The template may be photocopied if additional copies are needed.

As with all records required by the Regulations, you must keep the above for at least 5 years

3. Further information

The Fertiliser Manual (RB209) is due to be released by Defra in 2009. The Fertiliser Manual (RB209) is the revised version of Defra's Fertiliser Recommendations for Agricultural and Horticultural Crops (RB209) publication (7th edition, 2000), available electronically at: www.defra.gov.uk or in hard copy from The Stationery Office, PO Box 29, Norwich, NR3 1GN or: www.thestationeryoffice.com

A free copy of PLANET can be obtained by going to www.planet4farmers.co.uk or by telephoning 08456 023864.

A free copy of the MANNER software can be obtained by telephoning 01623 844331 or by going to www.adas.co.uk/manner

"Tried and Tested" – a simple paper-based Nutrient Management Plan is due to be released in 2009.

GUIDE FOR PRODUCING THE PLAN AND KEEPING THE SUBSEQUENT RECORDS

A **plan** must be produced for each crop grown in each field. A number of **subsequent records** must also be kept. A template for your plan and subsequent records is provided in Annex 2.

This guide provides further information on:

- how to carry out each of the four ‘planning’ steps;
- when each of the ‘planning’ steps must be completed and what information needs to be recorded; and
- the subsequent records that must be kept.

Plan	Subsequent records
<p>Record before applying any nitrogen fertiliser:</p> <ul style="list-style-type: none"> • Field reference/name; and • Area of the field planted or intended to be planted. 	<p>You must record:</p> <ul style="list-style-type: none"> – within one week of planting a crop: <ul style="list-style-type: none"> • Crop type; and • Date planted (if appropriate) – by 30 April, if grass, how it was managed (cut or grazed) in the previous calendar year – the crop yield (if arable) within one week of ascertaining it
<p>Step 1: Assessing the Soil Nitrogen Supply (SNS)</p>	
<p>Methods of assessment</p> <p>You can assess SNS using an Index value based on information about the soil type, previous cropping, previous manure and fertiliser use and winter rainfall.</p> <p>Alternatively, the use of soil sampling and analysis is recommended where high or uncertain amounts of soil nitrogen are expected. This will need to include an estimate of the amount of nitrogen that is likely to become available for crop uptake due to the mineralisation of soil organic matter and from previous crop residues.</p> <p>Timing</p> <p>Make an initial assessment of SNS before applying any nitrogen fertiliser. It is recommended you review this initial assessment before each application of nitrogen fertiliser and update if necessary.</p>	

<p>Record the following information</p> <ul style="list-style-type: none"> • Soil type; • Previous crop; • If the previous crop was grass, how it was managed – cut or grazed; • Amount of nitrogen from the soil that is likely to become available for uptake by the crop during the growing season (SNS); and • Method used to ascertain SNS. 	
<p>Step 2: Assessing crop nitrogen requirement</p>	
<p>Methods of assessment</p> <p>There are a wide variety of sources of information to help you assess the crop nitrogen requirement, including FACTS qualified advisers, PLANET software and the Fertiliser Manual (RB209) – see ‘Further information’.</p> <p>Timing</p> <p>Make an initial assessment of the crop nitrogen requirement for the whole growing season before applying any nitrogen fertiliser. It is recommended you review this initial assessment before each application of nitrogen fertiliser and update if necessary.</p> <p>Record the following information</p> <ul style="list-style-type: none"> • Crop type; • If it is an arable crop, the anticipated yield; • If it is grass, the intended management – cut or grazed; • Anticipated month the crop will be planted (not necessary if previous crop is grass and it has not been ploughed out); • Crop nitrogen requirement taking account of SNS; and • A copy of any advice from a FACTS qualified adviser. 	

<h2>Step 3: Organic manure applications, crop available nitrogen</h2>	
<p>Methods of assessment</p> <p>You can use typical values for the total N content of the manure and the percentage of this nitrogen that is expected to become available for crop uptake. These typical values can be obtained from a number of sources, including MANNER software and the Fertiliser Manual (RB209) – see ‘Further information’.</p> <p>Alternatively, you may use the results from sampling and analysis of the manure.</p> <p>For both methods you will need to take account of the type of organic manure, the date, rate and method of application and the soil type.</p> <p>Timing</p> <p>Make the assessment before each application of organic manure. This includes applications following harvest of the previous crop but before the next crop is sown or planted.</p> <p>Record the following information</p> <ul style="list-style-type: none"> • Area to which the organic manure will be applied; • Quantity of organic manure to be applied; • Planned date of application (month); • Type of organic manure; • Total N content of the organic manure; and • Amount of nitrogen that is likely to become available for crop uptake in the growing season in which the organic manure is applied. 	<p>You must record within one week of each application.</p> <ul style="list-style-type: none"> • Date of application • Area of application (ha) • Quantity of organic manure applied • Method of application • Type of organic manure • Total N content (kg N/ha) • Amount of nitrogen that is available for crop uptake • See notes below Step 4

Step 4: manufactured nitrogen fertiliser applications	
<p>Methods of assessment</p> <p>The amount of manufactured nitrogen fertiliser required can be calculated by deducting the crop available nitrogen supplied from all applications of organic manures (identified from Step 3) from the crop nitrogen requirement (identified at Step 2).</p> <p>Timing</p> <p>Make the assessment before each application of manufactured nitrogen fertiliser. This includes applications following harvest of the previous crop but before the next crop is sown or planted.</p> <p>Record the following information</p> <ul style="list-style-type: none"> • Amount of nitrogen needed from manufactured nitrogen fertiliser, taking account of the crop available N from applications of organic manure; and • Planned date of application (month) 	<p>You must record within one week of each application.</p> <ul style="list-style-type: none"> • Date of application • Amount of nitrogen applied (kg N/ha)

Notes

If your actual applications of manufactured nitrogen fertiliser or organic manure were as planned, there is no need to re-record the details of the application, you can simply confirm that the application was undertaken as planned. However, you will still need to record the actual date of each application.

If your actual applications differed from your plan, you will need to record full details of the applications.

The Environment Agency will use the subsequent records of actual applications to check your compliance with a number of other NVZ rules.

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London SW1P 3JR

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PB12736f October 2008