

**Farming**  
Advice Service

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# Nitrate Vulnerable Zones:

Back to basics



## Designation in 2017

Nitrate Vulnerable Zones (NVZs) are areas designated as being at risk from agricultural nitrate pollution. They account for approximately 55% of agricultural land in England. Defra undertakes a review of the designated NVZ areas every 4 years to account for changes in water quality.

The NVZ designation was reviewed during 2016 and the new designations for 2017 to 2020 began on 31 December 2016. These revised designations include areas that are newly designated as NVZs and exclude areas that have been de-designated.

During early 2017, Defra sent written notice to any person who appears to own or occupy land falling completely or partly within an NVZ. These informed farmers of the designation and their need to comply with NVZ rules.

You can check if you are in a designated area by entering your postcode into the Environment Agency's [mapping tool](#).

The map legend on the right-hand side of the screen can be used to see if the land is showing as a 'Final 2017 Nitrate Vulnerable Zones' (i.e. post appeals) in addition to existing ground water and surface water designations.

Further information regarding NVZ designation is available on [GOV.UK](#)

If your land is in an NVZ, you must follow the legal requirements that apply to NVZs, as specified on the following pages of GOV.UK:

- [Using nitrogen fertilisers in nitrate vulnerable zones](#);
- [Storing organic manures in nitrate vulnerable zones](#).

You have a legal requirement to follow the NVZ rules. However, please be aware that if you are claiming under the Basic Payment Scheme (BPS) or certain Pillar II Schemes such as Environmental or Countryside Stewardship, failure to comply with the rules could result in a reduction in your Basic Payment Scheme (BPS) payment.

## Application of organic or manufactured fertiliser

The list of nitrogen fertilisers includes manufactured (inorganic, bagged) fertilisers, other materials containing nitrogen (including compost, dredgings and waste soil) or organic manures that you produce or bring on to your holding.

Organic manures come from animals, plants or humans. They include:

- slurry
- poultry manures
- solid manures (such as farmyard manure, sludge cake or compost)
- sewage sludge (also called biosolids)
- other liquid manures (such as abattoir waste or anaerobic digestate)

If you use any of these materials on your agricultural land, it is important that you read the information available on the '[Using nitrogen fertilisers in nitrate vulnerable zones](#)' page on GOV.UK.



## N-max

There is a limit on the average amount of manufactured fertiliser and crop-available nitrogen from organic manure that you can apply to most crops each year. This is known as the N-max limit.

Table 1 provides details of the N-max limit for specified crops:

You can apply more nitrogen to some crops if your expected yield is higher than the ‘standard crop yield’ shown in the Table 1:

- You can use an additional 80kg of nitrogen per hectare if you’ve used straw or paper sludge on the previous or current crop;
- For wheat and barley, you can use an additional 20kg of nitrogen per hectare for every tonne that the expected yield exceeds the standard yield;

- On milling wheat varieties, you can use an additional 40kg of nitrogen per hectare;
- On autumn and winter-sown wheat and winter barley you can use an additional 20kg of nitrogen per hectare on fields with a shallow soil type (except on shallow soils over sandstone);
- On winter oilseed rape you can use up to 250kg of nitrogen per hectare. This includes a maximum autumn (closed period) application of 30kg of nitrogen per hectare of manufactured nitrogen fertiliser. If you use 30kg of nitrogen per hectare in the autumn, you can only use up to 220kg of nitrogen per hectare in the spring. However, you can increase this by an additional 30kg of nitrogen per hectare for every half tonne that the expected yield exceeds the standard yield;
- On grass that’s cut at least 3 times in a year, you can use an additional 40kg of nitrogen per hectare;

**Table 1 – N-max limit for specified crops**

Crop	N-max (kilograms of nitrogen per hectare)	Standard crop yield (tonnes per hectare)
Autumn or early winter-sown wheat	220	8
Spring-sown wheat	180	7
Winter barley	180	6.5
Spring barley	150	5.5
Winter oilseed rape	250	3.5
Sugar beet	120	-
Potatoes	270	-
Forage maize	150	-
Field beans	0	-
Peas	0	-
Grass	300	-
Asparagus, carrots, radishes, swedes, individually or in any combination	180	-
Celery, courgettes, dwarf beans, lettuce, onions, parsnips, runner beans, sweetcorn, turnips individually or in any combination	280	-
Beetroot, brussels sprouts, cabbage, calabrese, cauliflower, leeks individually or in any combination	370	-

- On grass grown for dehydration or chlorophyll production you can use nitrogen up to the level recommended in writing by a FACTS-qualified adviser if you're growing grass to achieve a protein content of at least 16% in the dried product.

If the land is irrigated, this level must not be more than 700kg of nitrogen per hectare. If the land isn't irrigated, it must not be more than 500kg of nitrogen per hectare.

In subsequent years, you must sample these fields between 1 September and 31 October for soil mineral nitrogen levels and give your FACTS-qualified adviser the results.

## Farm limits

You can apply up to 170kg per hectare of nitrogen in livestock manure (including manure deposited directly by livestock and spreading) on your holding in each calendar year. This limit is the loading limit and applies as an average across your holding. It's separate from the field limit of 250kg per hectare from organic manures.

## Field limits

You must not use more than 250kg of total nitrogen from all organic manures spread in any 12-month period on any single hectare of your land. This limit (the field limit) doesn't include livestock manures deposited by grazing animals.

## N Planning

You must plan all applications of nitrogen on each crop in each field (including grass). This is your fertilisation plan and you must keep it as part of your farm records.

You must use standard values to work out how much nitrogen is produced by the livestock on your farm or bought on to your farm. You must plan so that you don't exceed the limit.

You can download the [NVZ Guidance - Blank 'farmer completion' and 'standard values' tables](#) from [GOV.UK](#) to assist you with planning your nitrogen applications for your crops.

Detailed guidance on planning nitrogen use, including step-by-step guidance can also be found on the '[Using nitrogen fertilisers in nitrate vulnerable zones](#)' page on GOV.UK.

## Slurry spreading

If you are in an NVZ, you must only spread slurry and lightly fouled water (dirty water) using equipment that has a low spreading trajectory (that is, less than 4 metres from the ground). There is an exception if you use equipment that spreads slurry at a maximum rate of not more than 1 millimetre/hour when operating continuously.

If you are spreading on bare soil or stubble (except if it has been sown with seed), then you must:

- incorporate poultry manure, slurry and liquid digested sludge as soon as practicable and within 24 hours;
- incorporate any other organic manure (unless it has been spread as a mulch on sandy soil) as soon as practicable and within 24 hours if the land is sloping, and within 50 metres of surface water that could receive its run-off.

You do not have to incorporate slurry and liquid digested sludge if it has been applied using a trailing hose, trailing shoe, dribble bar band spreader or an injector.

The closed period does not apply to organic manures with a low readily-available nitrogen content, which **may** include:

- farmyard manure (FYM);
- duck manure produced by birds on straw or wood shavings (but you are expected to demonstrate a low level of readily-available nitrogen by sampling and analysis).

Applications of manure with a low readily-available nitrogen content must still comply with the non-spreading conditions and areas.

**You must not** spread organic manure:

- when the soil is waterlogged, flooded, snow-covered or frozen for more than 12 hours in the previous 24 hours;
- less than 50 metres from a spring, well or borehole;
- within 10 metres of surface water, except:
  - on land managed for breeding wader birds or as species-rich semi-natural grassland and under certain circumstances (see the guidance on [GOV.UK](#));

- when you are using precision manure spreading equipment to apply slurry, sewage sludge or anaerobic digestate, in which case you may spread manure 6 metres or more from surface water.

For further details about the organic manure closed periods and your requirements, please refer to guidance on the [Using nitrogen fertilisers in nitrate vulnerable zones](#) page on GOV.UK.

## When you can't spread manures with high readily available nitrogen (closed periods)

The Nitrate Pollution Prevention Regulations establish 'closed periods' for the application of organic manures that contain high readily available nitrogen (N) (that is, where more than 30% of the total N content is in a form easily used by plants). These manures (for example, slurry, poultry manure, liquid digested sludge and anaerobic digestate) present a significant risk of polluting water if spread on the land at the wrong time of the year. If your land is located within an NVZ, you must not spread these manures during the dates shown in Table 2.

There are some exceptions to the rules for the closed periods:

- If a crop is sown on sandy or shallow tillage land on or before 15 September, you may apply organic manure between 1 August and 15 September inclusive.
- If you are an organic farmer or you are formally converting to organic status, applications up to a maximum rate (150kg total N/ha) will be permitted during the closed period to:
  - Winter oilseed rape and grass – applications are permitted between the start of the closed period and the end of October. No more than 40kg N/ha can be spread on grassland at any one time.

- Asparagus, brassicas, overwintered salad onions, parsley and bulb onions – applications can be between the start of the closed period and the end of February. In the case of brassicas, up to 50kg N/ha can be spread every 4 weeks until the harvest (the 150kg N/ha total limit still applies).
- Other crops – based on written advice from a FACTS qualified adviser.

### Preparation of a risk map

Please note, if you spread organic manure on your land, **you must** prepare a risk map. It must show:

- each field and its area in hectares;
- areas with sandy or shallow soils;
- land with a slope greater than 12 degrees;
- land drains (except if they are sealed and impermeable);
- sites suitable for temporary field heaps (if you intend to use them to store manure);
- land that has a low run-off risk (if you intend to use it for spreading during the storage period to reduce your storage capacity requirement);
- all surface waters on your holding and land within 10 metres of them;
- all springs, wells and boreholes on your holding, and within 50 metres of the boundary of your holding, and land within 50 metres of them.

Further details of what should be included on the risk map can be found on the '[Using nitrogen fertilisers in nitrate vulnerable zones](#)' page on GOV.UK.

**You must** update the risk map within 3 months of a change in circumstances (e.g. you take on more land, or you install or remove field drains) and it should be retained for 5 years.

Table 2: Closed periods for spreading organic manure

	Grassland	Tillage land
Sandy or shallow soils	1 September to 31 December	1 August to 31 December
All other soils	15 October to 31 January	1 October to 31 January



## Storing organic manure

If you store organic manure on your land, it is important to read the information on the '[Storing organic manures in nitrate vulnerable zones](#)' page on GOV.UK. Here, you will find guidance on complying with the rules for storing slurry and poultry manure, solid manures (including how to find a suitable location for temporary field heaps), constructing or enlarging storage facilities and the record keeping requirements.

## Storing slurry over winter

Slurry and poultry manure are also subject to a minimum storage capacity as set out in the regulations.

**You must** have sufficient facilities to store all slurry produced on the holding and all poultry manure produced in a yard or building during the following 'storage periods':

- 1 October to 1 April (6 months) in the case of pigs and poultry;
- 1 October to 1 March (5 months) in the case of other livestock (cattle, sheep, goats, deer and horses).

If you have any slurry on your farm, **you must** store it in a tank, lagoon or other suitable facility. These requirements are set out in the Water Resources (Control of Pollution) (Silage, Slurry and Agricultural Fuel Oil) (SSAFO) (England) Regulations 2010. If you are building a new store or substantially altering or enlarging your slurry storage facilities, you must notify the Environment Agency at least 14 days before you start any construction work.

You can contact your local Environment Agency team who will assess and advise you on your proposal by email [enquiries@environment-agency.gov.uk](mailto:enquiries@environment-agency.gov.uk) or telephone 03708 506 506. Expect to be asked to provide further details about the location, design and capacity of your proposal.

For further details, please refer to guidance on the [Storing organic manures in nitrate vulnerable zones](#) page of the GOV.UK website.

Slurry stores **must** have the capacity to store, in addition to the slurry:

- rainfall expected to enter the store during the storage period (rain falling directly into the store and washings from elsewhere, including contaminated yards);
- any washwater or other liquids that enter the store during that period.

If you have poultry manure or other types of solid manure, **you must** store them:

- in a vessel;
- on an impermeable base, with appropriate collection and containment of runoff;
- in a roofed building;
- in an appropriately located temporary field heap

## Minimum storage

You may need a greater storage volume if, in some years, you can't empty the store before the start of the closed period. Using average rainfall data, may, in some years, under estimate the amount of storage required so a longer average rainfall period may need to be used when calculating requirements.

For further details about the storage requirements, please refer to guidance on the [GOV.UK](https://www.gov.uk) website. You can also use the [Agriculture and Horticulture Development Board \(AHDB\) slurry wizard](#).

## Separation of slurry

Slurry is a liquid organic manure that is produced by livestock (other than poultry) while in a yard or building. It includes animal bedding and water that drains from areas where animals are kept.

If you separate slurry into solid and liquid parts, you must do so either using a purpose-built machine or on an impermeable surface where you can collect the liquid that drains from it. If the solid that remains can be stacked in a heap without leaking liquid, it can be treated as FYM. If not, it is still slurry. If there is leakage from a stack, you must collect this and treat it as slurry.

## Rules for manure heaps

You may store some types of solid manure in temporary field heaps. This option applies to poultry manures and other organic manures if:

- they are solid enough to be stacked in a free-standing heap,
- they do not give rise to free drainage from within the stacked material.

If you choose to store manure in temporary field heaps, you need to comply with the following rules.

### You must:

- cover any poultry manure without bedding/litter that is stored in a field heap with an impermeable sheet;
- move any field heap at least every 12 months;
- leave a 2-year gap before returning to the same site;
- keep a record of the sites used for field heaps and the dates of use.

**You must** ensure that you do not build or maintain a field heap:

- within 10m of surface water (including ditches) or land drain;
- within 30m of surface water (including ditches) if the land slopes steeply (12 degrees (1 in 5 or 20%) or greater);
- within 50m of a spring, well or borehole;
- on land likely to become waterlogged;
- on land likely to flood.

The field heap site must occupy as small a surface area as possible, but be sufficient to support the mass of the heap and prevent it from collapsing.

For further details about the rules for manure heaps, please refer to guidance on the [Storing organic manures in nitrate vulnerable zones](#) page on the GOV.UK website.



## Closed periods for the application of manufactured fertiliser

The NVZ rules also establish closed periods for the use of manufactured fertiliser. You must not apply manufactured fertiliser to:

- tillage land between 1 September to 15 January;
- grassland between 15 September and 15 January.

There are some exceptions. Manufactured fertiliser may be spread on the crops listed in Table 3 providing the amounts spread do not exceed those stated.

**Table 3: Crops that can receive manufactured fertiliser**

Crop	Maximum rate (kg N/ha)
Winter oilseed rape	30
Asparagus	50
Brassicas	100
Grass	80
Overwintered salad onions	40
Parsley	40
Bulb onions	40

In the case of:

- winter oil seed rape and grass – applications are allowed between the start of the closed period and the end of October;
- grass – a maximum of 40kg N/ha may be spread at any one time;
- brassicas – an additional 50kg N/ha may be spread every 4 weeks during the closed period up to the date of harvest.

In the case of other crops, manufactured fertiliser may be spread on the basis of written advice from a FACTS qualified adviser.

For guidance regarding NVZ requirements when using nitrogen fertilisers can be found on the [Using nitrogen fertilisers in nitrate vulnerable zones](#) page on GOV.UK.

## Livestock manure

You will need to keep a record of the number and type of livestock kept on your land. This is to ensure that the amount of nitrogen produced in the livestock manure deposited does not exceed the loading limit of 170kg of nitrogen per hectare per calendar year (N/ha/yr). You are also required to keep a record of any manure that is imported or exported from the holding.

You can use the [NVZ Guidance - Blank 'farmer completion' and 'standard values' tables](#) to assist with the calculations. The table provides standard values for the:

- amount of nitrogen produced by different types of livestock manure;
- volume of excreta;
- the number of animals that you can keep per hectare to comply with maximum N loading of 170kg/ha N per year.

The contents page will help you to understand what tables apply to your business.



## Low-intensity farms

You are defined as a 'low-intensity farmer' if **all** of the following apply to you:

- at least 80% of your land is grassland;
- you apply no more than 100kg of nitrogen per hectare per year as organic manure (including any nitrogen in manure deposited on the field by livestock);
- you spread no more than 90kg of nitrogen per hectare per year as manufactured fertiliser;
- you do not bring any organic manure onto your holding.

If you meet this definition you do not have to keep a record of your actual applications of manufactured fertiliser and organic manure in each field. However, you must have recorded information to show that you meet the criteria for low-intensity farms and still plan your nitrogen use by keeping a fertilisation plan.

When calculating your fertiliser applications, you must not include any area of your holding where you do not spread any fertiliser or work the soil (for example, on rough grazing areas).

## RB209 Fertiliser Manual

A new version of the RB209 Fertiliser Manual was released in amend to February 2020. Further information on this can be located on the [AHDB website](#).



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## Get in touch with the FAS

If you would like to speak to a free, independent adviser regarding the NVZ requirements, please contact FAS on **0300 020 0301** or [advice@farmingadvice.org.uk](mailto:advice@farmingadvice.org.uk).



### Webinar

During February 2017, FAS recorded an online presentation for farmers regarding the rules for Nitrate Vulnerable Zones (NVZ) – Statutory Management Requirement (SMR) 1.

The webinar provided information on:

#### **SMR1**

presented by Andrew Wells from FAS.

#### **NVZ designations, rules and requirements**

presented by Corinna Blackmore from the Environment Agency.

There was also a question and answer session.

To view the recording, please go to the FAS [webinar page](#).



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