

# JANUARY 2009

1 January 2009 is a key date for farmers in nitrate vulnerable zones (NVZs) as it marks the date from which the new rules focusing on nitrogen use come into effect. John Morgan of Creedy Associates, a Devon based Farm Management consultant who has developed a specialism in NVZ planning and practical muck management, has prepared this briefing note on the latest changes. The aim of this technical supplement is to provide a practical guide to what the regulations actually contain, some guidance on timescales and an introduction of the record keeping requirements.

## KEEP IT PRACTICAL

### Are you in an NVZ or not?

Firstly it is important to stress that while the area of England designated as a NVZ has increased from 55 to 68% not all Members will be within an NVZ. For those lucky enough to be outside the designated area it is crucial to clarify that none of the rules outlined below will apply to you.

For those unsure of whether they are in or out of the designated zones, national, regional and field specific maps are available via the DEFRA link on page 3.

Also available from the DEFRA website are eight excellent information booklets which set out the rules in detail as well as providing useful templates for the records required.

### Timescales

The second general point to make is that the date from

which the new rules apply differs depending when your farm was designated. For those currently in a NVZ, (the River Taw in North Devon for example) the new rules come into effect on 1 January 2009. For those in newly designated areas, such as the Exe Catchment, the new rules come into effect on 1 January 2010. Regardless of when your farm was made an NVZ, the organic manure closed spreading periods, minimum storage requirements and high trajectory spreading restrictions will not come into effect until 1 January 2012 unless you have sufficient storage now. If you do have sufficient storage then you must abide by the closed periods from day one.

### Livestock manure nitrogen loading

The livestock manure nitrogen (N) limit is in fact a stocking rate limit where livestock are being classed by their annual nitrogen production rather than as livestock units. Standard nitrogen production figures for each class of livestock need to be multiplied by average livestock numbers on the holding to come up with the total nitrogen production on the farm. This total should then be divided by the number of hectares available to come up with a livestock Manure Nitrogen Loading figure. The new rules say that this loading figure should not exceed 170 kg/ha. It is important to note that this is a livestock manure loading limit and that sludges, composts or other industrial wastes are not included in the calculation. This rule has nothing to do with manure spreading restrictions.

### Key issues:

The key elements of new NVZ rules include:

- Livestock manure nitrogen farm limit which in effect is a stocking rate restriction
- Field limits as to how much Nitrogen you can apply as manures including slurries
- Closed periods for manures and bagged fertiliser
- Minimum storage requirements for manures with high levels of available nitrogen (slurry and poultry manure)
- Nitrogen fertiliser planning and crop nitrogen limits
- Manure spreading restrictions
- Record keeping requirements to allow the rules to be policed

### Derogation

Members should be aware that while DEFRA has applied to Europe for a derogation from this 170 kg N limit for grassland, their aim being to increase the limit to 250 kg N/ha, there is no guarantee of success and even if successful conditions focused on minimum grass areas and phosphate planning are likely to be imposed. Farmers close or likely to exceed the limit will need to consider exporting manures, increasing the area of land farmed or reducing stock numbers.

### Organic manure field limit

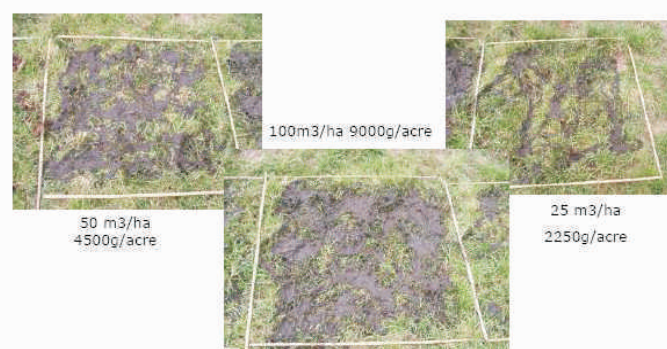
As the name suggests there is a limit (250 kg/ha of Total Nitrogen) to how much organic manure can be applied to any one field during any 12 month period. This limit applies to all organic manures including sludges composts and other industrial wastes.

Table 1 shows the maximum application rates for various manures to ensure the field limit is not exceeded.

Manure Type	Maximum Application rate to supply 250 kg N/ha	
	Metric	Imperial
Cattle FYM	42 t/ha	17 t/acre
Dairy Slurry	83 m <sup>3</sup> /ha	7400 gallons/acre
Beef Slurry	125 m <sup>3</sup> /ha	11200 gallons/acre
Separated cattle slurry (liquid) strainer box	167 m <sup>3</sup> /ha	14900 gallons/acre
Separated cattle slurry (liquid) weeping wall	125 m <sup>3</sup> /ha	11200 gallons/acre
Separated cattle slurry (solid)	63 t/ha	25 t/acre

What some typical spreading rates look like in practice are represented in the pictures below:

## Spreading Rates



### Closed periods for organic manures

This issue is a major concern for many, particularly bearing in mind the weather over the last couple of years. The closed period aims to reduce the nitrate leaching that results from autumn/winter applications of manure.

Firstly it is important to note that closed periods only apply to high available nitrogen manures such as slurries and poultry manures. There is **no** closed period for stackable manures such as Farm Yard Manure or solids from weeping wall, strainer box or mechanical separation systems.

**Table 2: Closed periods for high available nitrogen organic manures**

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

### Exemptions to the closed period

There are various exemptions from the closed period rules, the most notable of which is that available to organic farmers who will be allowed to spread otherwise banned manures, within the closed period at restricted rates, on a set list of crops including grassland.

total storage required. Booklet four of the DEFRA guidance provides a template for this calculation (also see the worksheet on the back of this Technical Supplement).

### Closed periods for bagged fertiliser

Alongside closed periods for organic manures there are also closed periods for manufactured fertiliser although they should not be an issue for most as they coincide with months during which very little bagged nitrogen is normally applied.

Furthermore there is a specific list of crops, including grassland, on to which bagged fertiliser can be applied within the closed period. Qualified advisors can also recommend bagged fertiliser within the closed period for non listed crops.

**Table 3: Closed period for manufactured (bagged) fertiliser N**

Grassland	15 September to 15 January
Tillage	1 September to 15 January

### Storage of Solid Manures

Solid manure storage has also been tightened up. Manure can be left in the shed in which it was produced, on a liquid proof yard or tipped in temporary field heaps. If stored on a yard the liquid that drains from it should be treated as slurry and is subject to the closed period and five month storage requirements.

Temporary field heaps cannot be in the same place for more than twelve months and you must leave a two year gap before returning to the same site. Usefully manures suitable for temporary field storage are defined as those that "do not give rise to free drainage from within the stacked material". My understanding is that this definition excludes drainage resulting from rainfall on a heap but includes drainage resulting from the manure itself. You must mark your temporary manure heaps and the dates they were used for on your risk map which is discussed further overleaf.

### Crop Nitrogen Planning

This very new element of the proposals is split into two distinct sections. The first focuses on justifying the need for nitrogen be it from a bag or manure on



Remember that unless you currently have sufficient storage (five months for dairy slurry) for your manures the closed period rule does not come into effect until 1 January 2012.

### Minimum storage

Linked to the closed period is the requirement for five months minimum storage for dairy or beef slurry. The storage period is set as 1 October to the 1 March. Using standard values farmers will need to be able to demonstrate that they have sufficient storage. Only slurry collected and stored need be taken into account which means those who out winter stock or loose house animals will not need to build storage for these animals.

### Dirty Water

Another real opportunity to reduce storage requirements is to minimise the quantities of dirty water allowed to enter slurry storage. Dirty water (rainwater, parlour washings, runoff from lightly fouled yards/concrete areas)

if kept separate from slurry, is **not** subject to the closed period and does not need to be stored. It is important to note that the liquid from weeping walls, strainer box's and mechanical separators plus silage effluent contains significant available nitrogen and should therefore be treated as slurry and must be taken into account when working out storage requirements and should not be spread in the closed period.

As previously mentioned standard manure production values should be multiplied by stock numbers and combined with any rain and wash water that enters the slurry store to calculate the



an individual crop with the second focusing on the nitrogen supplied to all fields growing specific crops.

For each field you will have to justify your nitrogen fertiliser by matching crop nitrogen requirements with that supplied by the soil and any manure you apply. This field justification has the potential to save you considerable money as a result of the improved use of the nutrients contained within organic manures that may result. Further benefits are possible if balancing crop requirements for phosphate and potash, alongside nitrogen, is done.

### Nmax limit

The crop group limit or max limit calculation is less obviously useful. Its aim is to limit the nitrogen applied to certain crop groups. Each crop group (e.g. Winter wheat) has a nitrogen or Nmax limit and each year growers need to ensure that total nitrogen applied to all fields with this same crop group do not exceed the Nmax figure. While the Nmax limit is for all the

Crop	Nmax limit (kg N/ha)
Wheat, autumn or early winter sown	220
Wheat spring sown	180
Barley, winter	180
Barley, spring	150
Oilseed rape, winter	250
Sugar beet	120
Potatoes	270
Forage maize	150
Field beans	0
Peas	0
Grass	330

fields growing a particular crop individual field adjustments can be made to Nmax depending on individual field circumstances. Not all crops have an Nmax figure, those that do, and their Nmax limit, are shown in table four.

(note individual field circumstances will alter Nmax limits)

The good news in relation to Nmax calculations is that early indications from the Environment Agency suggest that while calculation of Nmax in the first year may be required further calculations in future years may not be necessary if growers are nowhere near the Nmax limits.



### Spreading locations

The rules regarding where you can spread nitrogen be it from manures or bagged fertiliser largely remain similar to current NVZ farmers. Those new to NVZs though should note that no organic manure should be spread:

- Within 50 m(150 ft) of a spring or bore hole or 10m (30ft) of any surface water (ditch, stream or river etc)
- On waterlogged, frozen, snow covered or flooded land.

### Useful Links and further practical information:

**Defra NVZ website** <http://www.defra.gov.uk/Environment/water/quality/nitrate/nvz2008.htm#help>

**Guidance for farmers in NVZs – 9 leaflets** <http://www.defra.gov.uk/environment/water/quality/nitrate/help-for-farmers.htm>

**Defra leaflet PB 12736 Record Keeping** <http://www.defra.gov.uk/environment/water/quality/nitrate/pdf/nvz-record-keeping-checklist.pdf>

Information also available from the **Creedy Associates** Website: [www.creedyassociates.com](http://www.creedyassociates.com)

**DairyCo Publications** – 'Cost effective slurry storage strategies on dairy farms', includes worksheets to calculate slurry production and storage

**DairyCo Slurry Wizard** available on CD-ROM from DairyCo Publications: [www.dairyco.org.uk](http://www.dairyco.org.uk)

### Steep sloping land

New to the regulations for all NVZ farmers is the rule that says no nitrogen fertiliser be it manure or manufactured can be spread on steep sloping land (12 degrees or 1 in 5 or more) where there is a significant risk of causing pollution. You the farmer decide what is a significant risk in the first instance. Guidance, in Leaflet eight, suggests slope and location of a watercourse should be taken into account.

### Risk Map

Farmers will also be required to produce a risk map similar to the Farm Waste or Manure Management plans many of you already have. Additional information will have to be added to the maps including sloping land, soil types as well as the location of field manure heaps.

How manure is spread also comes under new rules. From 1 January 2012 no slurry can be spread higher than four metres above the ground. From day one slurries and poultry manures, where broadcast, will have to be incorporated or mixed with the soil within 24 hours. Lower available N manures such as Farm Yard Manure will only need incorporating with the 24 hours if they are applied within 50 metres of surface water.

### Record keeping

As previously mentioned record keeping is very likely to be the first and most important method used by the Environment Agency to police the new regulations. For this reason getting the required paperwork in some order is very important. There is a special DEFRA leaflet entitled NVZ record keeping checklist, which you should get hold of either direct from DEFRA publications or via the internet link below.

The key requirements relating to these changes in NVZ rules are outlined in Table five below:

You will need to:-	✓
Calculate your farms manure nitrogen loading (stocking rate)	
Calculate manure storage requirements (if required) by 30 April 2009 for existing NVZ farmers	
Produce a risk map for the farm and use it to show the location of any temporary manure storage sites	
Produce a field by field fertiliser plan before any nitrogen is applied	
Keep up to date field records showing details of all nitrogen applied	
Record details of any imported or exported manures	

### Conclusions

There is no doubt that these new NVZ rules present a real challenge and in some cases require considerable investment. That said the regulations will encourage better use of the nutrients contained within organic manures which, with current sky high fertiliser prices, can only be a good thing. All those affected should read the guidance leaflets carefully using the information they contain to identify the considerable opportunities to soften what to the uneducated may seem very harsh rules. In particular for those having to invest in storage facilities it is important that dirty water storage is minimised if unnecessary expenditure is to be avoided.

# Storage of Organic Manure: Calculation example - format for self help

You must provide, by 1 January 2012, sufficient facilities for the storage of slurry produced by livestock, whilst in a yard or building, during the storage period (1 October to 1 March).

The guidance booklet suggests the following process is followed when calculating how much storage you need. The aim is to calculate a figure for slurry produced compared to storage available and followed by action plans as required. This step by step guide will help you calculate how much storage you need on your farm to comply with the legal requirements of five months storage capacity for the slurry from the dairy herd. Further explanation can be found in Defra leaflet number four (Pb12736d).

## 1. Collect your information

## 2. Calculate the volume of slurry produced each month

Livestock Type	No	Proportion of excreta collected as slurry	Volume produced per month m <sup>3</sup>	Total volume per month (m <sup>3</sup> )
Dairy cow >9000 litres			1.95	
Dairy Cow 6-9000 litres			1.61	
Dairy Cow <6000 litres			1.28	
Dairy Heifer >24 mths			1.22	
Dairy Heifer 13-24 mths			1.22	
Dairy Heifer 3-12 mths			0.61	
Calf <3 months			0.21	
<b>Total</b>			<b>= A</b>	

## 3. Calculate the average volume of rainfall that enters your slurry store(s) each month

The five month volume of rainfall for the area is required. The following table provides a rough guide to the rainfall volumes in different regions. A more accurate figure can be obtained from local data. Complete the table for each month.

Month	Rainfall mm
Oct	
Nov	
Dec	
Jan	
Feb	
Total	
Divide by 5	<b>B</b>

Region	Oct	Nov	Dec	Jan	Feb
England SW	133	134	152	142	103
England SE	84	80	86	81	54
Midlands	74	73	83	76	56
England NW & Wales N	136	140	148	135	97
Scotland W	189	185	197	196	141

[www.metoffice.gov.uk](http://www.metoffice.gov.uk) 30 year averages

Now calculate the rainfall going into the slurry store in the period.

Area of slurry stores plus concrete surface area plus undiverted roof water m <sup>2</sup>	Average monthly rainfall (insert B)	Monthly rainfall volume entering slurry store m <sup>3</sup>
X	÷1000 =	<b>C</b>

## 4. Calculate the volume of wash water that enters your slurry store(s) each month

You only need to complete this if wash water drains into your slurry store.

Typical wash water use from high volume hoses is 0.9m<sup>3</sup> per cow per month (30 litres/cow/day), or from low volume hoses is 0.6m<sup>3</sup> per cow per month (20 litres/cow/day).

Number of cows in milk	Wash water used per month (m <sup>3</sup> )	Monthly dirty water production (m <sup>3</sup> )
X	=	<b>D</b>

## 5. Calculate the minimum volume of slurry that needs to be stored

Slurry produced	<b>A</b>	
Rainfall in the slurry	<b>C</b>	
Parlour and dirty water	<b>D</b>	
Total monthly volume A + C + D =	<b>E</b>	
<b>E x 5 = Minimum storage volume</b>	<b>F</b>	

## 6. Calculate the capacity of your existing slurry store(s)

Square or rectangular stores: multiply length by width by height in metres.

Circular stores: calculate the floor area (3.142 x radius<sup>2</sup>) and multiply by the height.

Earth banked stores: multiply average length by width by height.

In each case the actual height should be reduced by 0.3m to allow for freeboard as a safety margin (0.75m for earth banked stores).

Store	Length m	Width m	Area m <sup>2</sup>	Height m less freeboard	Capacity m <sup>3</sup>
1					
2					
3					
4					
5					
6					
<b>Total existing capacity</b>				<b>G</b>	

## 7. Compare existing slurry storage capacity with the capacity needed to meet the requirements

If G is greater than F you have more than the minimum storage required.

If F is greater than G then extra storage capacity is needed. Consider any actions that you can take to reduce the volumes of slurry (and dilution) that needs to be stored. This can be achieved through reducing the rainwater runoff, or the quantity of slurry (e.g. transporting some slurry away or changing the composition of the stored material). You must record any calculations and justifications that you have made for reducing the volume of slurry to be stored.

A *Slurry Wizard* which allows you to calculate slurry production and storage is available on a CD-ROM which you can obtain from DairyCo.