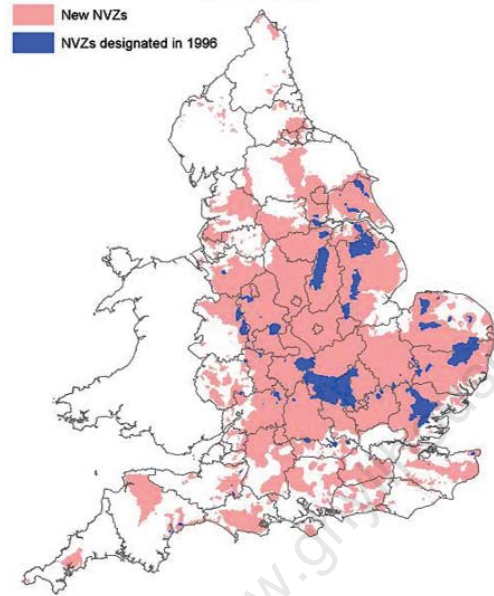




THE NITRATE VULNERABLE ZONE DIRECTIVE

Summary of Current NVZ Rules
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defra NITRATE VULNERABLE ZONES IN ENGLAND



From 19 December 2002 NVZ's were extended to 55% of England – as against the limited NVZ's introduced to 8% of England in 1996. To most dairy farms, the proposed rules do not threaten the business, but will cause some changes, and also remind us of good economic practice. The proposed actions are in two parts, one concerning nitrogen fertiliser use, and the other organic manure use on farm crops.

	Arable crops	Grassland
Closed period for using fertiliser nitrogen	Sept 1st - Feb 1st	Sept 15th -Feb 1st
Max fertiliser N use allowed	To crop requirement book recommendation	To crop requirement book recommendation
Max organic N use averaged over the whole farm (including grazing deposition)	210 kgs /ha total N	250 kgs /ha total N
From 19/12/2006 changing to:	170 kgs /ha total N	250 kgs /ha total N
Individual field limit (excludes grazing deposition)	250 kgs /ha total N	250 kgs /ha total N

Nitrogen Action Plan Commenced 19/12/2002

Organic Manuring

This is the area of proposed NVZ rules that will cause problems, particularly for those who farm sandy or shallow soils, where there will be a ban on spreading organic manures (with high available nitrogen) for 2 months (September and October on grassland) or 3 months (August-October inclusive on arable land). This includes spreading manure, and ploughing under an autumn reseed or winter cereal. There will need to be adequate manure (and dirty water) storage for not only this period, but also an extra few months until you can travel on the crop without damage. There will be 40% grant aid to help build this storage.

What then are the implications for when it is spread?

This is a comparison of an application of 50 t/ha of average dairy slurry onto a sandy loam soil. (All figures are in kgs N/ha)

	N leached in soil	N volatilised to air	Crop usable N
Slurry, spread and ploughed after 1-2 days, in mid Sept	51	23	8
Slurry applied to crop, in early March	0	28	55

The direct comparison above shows the probable success in preventing leaching, but also the fact that 55kgs N must be adjusted for when using extra bag nitrogen. Whilst the N is potentially saving £19/ha of purchased N, it is also potentially going to fill the silage clamp with all the wrong spoilage bacteria, resulting in a poor fermentation, and unpalatable silage!

For dairy farmers not on shallow or sandy soils, it is the 250 kg's /ha maximum organic N use that could prove difficult. It certainly precludes putting the whole slurry pit on one maize field! (250kgs N is approximately 80 tonnes of dairy slurry per hectare).

It will also worry those stocked above 2.5 LSU/ha, but the real problem will arise when there are intensive pig and poultry production enterprises on that dairy farm. The only solutions then available are to "export" organic manures to other farmland, (that is already below the maximum use,) or to burn the manure and generate electricity for the grid. Whilst this would reduce nitrates in water, it may increase other greenhouse gases in the atmosphere.

Example Farm Calculations

1. An intensive dairy farm, with 120 average sized cows, and calving down 30 heifers per year at 2.5 years old, on an all grassland farm of 60 hectares.

The simple calculation looks at the area of land needed for each category of stock to meet the 250kgs/ha overall limit for grassland:-

	Head	Max animals/ha	Hectares needed
Dairy Cows	120	2.6	46.0
Dairy Heifers >2 years	15	4.3	3.5
Dairy Growers 1-2 years	32	5.3	6.0
Dairy Growers 6-12 months	16	21	0.8
Dairy Growers 0-6 months	16	36	0.4
			56.7

This farm has sufficient area to spread all manure generated, and is 5% under the maximum 250kgsN loading criteria. However it does mean spreading that slurry over most of the farm, and not just the fields cut for silage. But, if the cows were larger Holsteins, (at 650kgs live weight,) and they calved their heifers at 3 years old, then they would be 15% over, and need 69 ha's and so will have to "export" manure to more area.

2. If that same dairy farm above had developed a 20,000 place broiler enterprise, in order to support another living from the business, then the calculation would be:-

	Head	Max animals/ha	Hectares needed
Dairy Cows	120	2.6	46.0
Dairy Heifers >2 years	15	4.3	3.5
Dairy Growers 1-2 years	32	5.3	6.0
Dairy Growers 6-12 months	16	21	0.8
Dairy Growers 0-6 months	16	36	0.4
Broilers	20,000	510	39.2
			95.9

The effect of the broilers is to take the organic manure loading to 400kgs N/ha, so needing 96 ha of grassland to spread it over, to comply with the 250kgs of organic N per hectare limit.

If taken as grass keep at £80 per acre, this would equate to an extra cost of 5 pence per bird – about half the average net margin made per chicken, but the extra grass would also have a major impact on the way the whole area is farmed.

3. For a larger mixed dairy/ arable farm, with broiler chickens, the calculation has to take into account the differing maximum nitrogen loading criteria for the different areas, and so uses the annual N excretion from the stock to calculate:-

OUTPUT:

	Numbers	Kgs N per head	Kgs N excreted
Dairy Herd, assuming 650 Kilos liveweight	300	116	34,800
Dairy Heifers >2 years	40	58	2,320
Dairy Growers 1-2 years	84	47	3,948
Dairy Growers 6-12 months	45	12	540
Dairy Growers 0-6 months	46	7	322
Broilerplaces	100,000	495 (per 1000)	49,500
		Total Output	91.430

AREA AVAILABLE TO SPREAD IT ON:

	Hectares	Limits per Ha	Kgs N allowed
Cereal area	240 ha	210 Kgs N limit	50,400
Maize area	75 ha	210 Kgs N limit	15,750
Grassland area	90 ha	250 Kgs N limit	22,500
		Total	88,650

Difference

There is an excess of 2780 kgs N produced on this 405 ha farm, which needs to "exported" to a 13.2 ha arable field elsewhere. But when the rules change (in Dec 2006) to a maximum of 170 kgs N/ha on arable land, this would mean an exportable surplus needing 73 ha of a neighbour's arable land.

In these calculations, you can only use the area that is suitable to spread organic manure upon, and so exclude woods, roads, buildings, steep land, and also that land within 10 metres of a stream, or 50 metres of a borehole.

Finally, it is worth noting that the detailed rules used in the NVZ areas already existing, refer to a definition of organic manures that cannot be used in that closed period, as animal excreta, (or mixed with washings, rainwater, bedding,) that have a consistency that allows them to be pumped, or discharged by gravity. That would seem to preclude straw-based farmyard manures?

Records

- Keep accurate field records, including details of cropping, livestock numbers, and use of manufactured nitrogen fertilisers and organic manures.

Crop Requirement

- Do not exceed crop requirement when applying manufactured nitrogen fertilisers, taking into account crop uptake, soil supply from organic matter, crop residues and organic manures.

Application Restrictions

Spreading Controls

- Do not apply manufactured nitrogen fertilisers or organic manures when the soil is waterlogged; or flooded; or frozen hard; or snow covered.
- Do not apply manufactured nitrogen fertilisers or organic manures to steeply sloping fields.
- Spread manufactured nitrogen fertilisers and organic manures evenly and accurately.
- Do not apply manufactured nitrogen fertiliser in such a way that they will enter into water courses.
- Do not apply organic manures within 10 metres of water courses and 50 metres of boreholes.

Explanatory Notes

Frozen hard – means when the soil surface is frozen for 12 hours or more in the preceding 24 hours.

Steeply sloping fields – no specific angle of slope is given in the legislation due to the complexity of landscape, soil condition, ground cover and rainfall after application. Fields in the steeply sloping category are unlikely to be cultivated, and the proximity of watercourses should be taken into account.

Crop requirement limitation – use Defra “Fertiliser Recommendations for Agriculture and Horticultural Crops” (RB209). Also take full account of expected crop uptake, allowance for the nitrogen available from the soil organic matter and previous crop residues (N index) and from organic manures. Soil mineral nitrogen analysis could also be used to provide more precise guidance.

Nitrogen available from organic manures – use “Manner” program or Defra booklet “Manure Planning in NVZ’s” to determine nitrogen available, as it will depend on the type of manure, timing and method of application and incorporation.

Avoid pollution of surface waters – this includes ditches, streams, lakes etc., which contain free water. You should also avoid temporarily dry and blind ditches.

Fertiliser application – avoid uncropped areas, hedges and ditches. All machines should be tested and calibrated regularly for accuracy of spreading.

Farmed base limit of organic nitrogen – includes all organic manures produced or deposited directly on the farm, and any imported material such as sewage sludge, pig or chicken manure etc. Standard figures can be used to calculate nitrogen excreta rates eg 650 kg Dairy cow excretes 116 kg N per so can be stocked at 2.2 LSU/ha to remain with 250 kg/ha N, or 1.8 LSU/ha for 210 kg/ha. Only land available for spreading can be used in calculation excluding woodland, roads, buildings etc. If you do not have sufficient land, you can export the manure to other land, but must then be included in that farm’s calculations.

Field based limit of organic nitrogen – this excludes N deposited by animals whilst grazing. The available field area excludes 10 metre buffer zones alongside ditches and watercourses.

Closed periods for spreading organic manures – a slurry is defined as excreta produced by livestock while in a yard or building, including mixtures with bedding, rainwater and washings, that have a consistency that allows them to be pumped or discharged by gravity at any stage of the handling process. The closed periods do not apply to farmyard manure (straw based manures).

Sandy soils – are defined as soils that are sand, loamy sand, or of sandy loam texture to 40 cm depth, and sand or loamy sand to 80 cm. The topsoil will contain less than 5% organic carbon.

Shallow soils – are defined as soils of 40 cm or less depth over rock, which is commonly chalk, limestone, or sandstone. It is the farmers’ responsibility to determine whether any land falls under the definition of sandy or shallow soils.

Record keeping – records are essential to monitor compliance with the NVZ rules and it is a legal requirement that they are available at all reasonable times for Environmental Agency inspection. The records will need to include:

- Area of farm and individual fields, excluding areas of woodland, roads and buildings.
- The cropping of each field including sowing dates.
- Applications of manufactured N fertiliser, including quantities and application dates.
- Applications of organic manures including type, quantity, and application dates.
- Livestock kept on the farm, including type and length of time kept.
- Any livestock manure imported or moved off of the farm, including quantities, dates and details of recipient or supplier.

Records must be kept for at least 5 years. The Promar forage program will cover these requirements, but we will need adjusting to add the applied organic N calculation to ensure compliance with 210 or 250 kg N/ha.

Grants for Farm Waste Facilities – if storage facilities need to be improved to cope with closed periods, there are grants available to help. Details of the scheme are given in Defra Publication PB 2529 “Farm Waste Grant Scheme in Nitrate Vulnerable Zones”

Please note this is only a summary - you should refer to the Defra publication Guidelines for farmers in NVZs for full details of the rules. With more details available on the Web Site at <http://www.defra.gov.uk/environment/water/quality/nitrate/>

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