

Guidelines for the Application of Manures



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INTRODUCTION

All farms need to comply with **The Farming Rules for Water**, and there are extra demands placed on many that are in the Nitrate Vulnerable Zones. The position with regard to slurry/digestate spreading can also be confusing.

We have asked Douglas Green, a well respected local agricultural consultant, to produce a simple guide to assist you in ensuring compliance with the regulations and minimise the risk of environmental pollution that can be caused by applying manures inappropriately.

This guide is not intended to replace the published guidance produced by DEFRA and the Environment Agency. The definitive guide can be downloaded from the web address in the Sources of Advice section in this booklet.

For clarity, we have included the rules required for all farmers in black text, and those solely required for farmers in NVZ areas in brown text.

We have a wealth of experience in spreading digestate from various sources. The rules are much more complex than handling home produced slurry and depend upon the source of the digestate. Call us and we can discuss your specific requirements and guide you on the best way to achieve your aims.

As responsible contractors, we take our obligations seriously.

Our staff are well trained and work diligently to provide our customers with a high quality service. The standards outlined here are the standards to which they will apply slurry to your land, but ultimately it is your responsibility to ensure that the regulations are adhered to.

You will need to provide them with the information they need to work with, and a safe environment to operate in. This should include a map of your farm showing the spreading hazards and required application rate by field.

Farm assured dairy farms should have a manure management plan which is invaluable in this respect.

ORGANIC MANURES ARE A VALUABLE RESOURCE

There is huge scope for many farms to use slurry or digestate more effectively. This makes sound economic sense and is beneficial to the environment.

More accurate applications, at the correct time mean big savings in fertiliser. So rather than put all your manures on your maize area, target it to maximum effect. Umbilical spreading is a proven method which achieves high levels of utilisation, a route that means aftermath applications are a practical reality. At current high fertiliser prices, this approach more than pays for the cost of spreading.

We utilise dribble bars which trap more of the nitrogen for use by the crop, and continually invest in equipment to give a wider application window and enable us to apply it more accurately. We also have a tanker with dribble bar which is more suited to the application of small volumes of slurry/digestate or for fields beyond the reach of our umbilical equipment.

Financial Value of Slurry

Example: Take a standard application of 30 m³/ha of slurry

Available Nutrient	Surface Applied		Shallow Injection	
	kgs/ha	£/ha	kgs/ha	£/ha
N	27	29	35	38
P	36	34	36	34
K	110	54	110	54
Value (Oct 23)		117		126

Timing of Application and Speed of Incorporation

These factors have a big influence on how much nitrogen you can trap. Spring applications increase the N available by 350% on sandy and shallow soils, fast incorporation or application by band spreader by 15%, and injection increases it by 30%.

ORGANIC MANURE SPREADING AND CROSS COMPLIANCE

Essential Points For All Farmers

You must not spread when the ground is:

- Waterlogged
- Flooded
- When tractors would damage the soil
- Frozen hard
- Snow covered

You must not spread manures less than 50m from a spring, well, borehole or within 10m of surface water. But if you are using precision manure spreading equipment, you may now spread manure to within 6m of surface water.

You must not spread more than 50t/ha slurry in a single application, and you must allow at least 3 weeks between applications.

Slurry applications to stubble or bare soil need to be incorporated within 12 hours unless applied by dribble bar.

FYM applications to stubble or bare soil do not have to be immediately incorporated if risk factors associated with diffuse pollution have been assessed and considered not relevant e.g. heavy rainfall/soil type etc.

Autumn Spreading of Manure: There is now a limit of 30 m³/ha for slurry and digestate, and 8t/ha for poultry manure per application between the dates below. You must not apply another application for at least 21 days:

Soil Type	Grassland	Tillage Land
Sandy or Shallow	1 st Sept to end Feb	1 st Aug to end Feb
All other Soils	15 th Oct to end Feb	1 st Oct to end Feb

You are required to **keep records** of all organic manures and fertilisers applied to each field for at least 5 years.

During and after spreading you should **inspect watercourses for signs of runoff**.

PHOSPHATE LEVELS AND MANURE SPREADING

The target Index for soil phosphate levels is 2. Anything over this increases the risk of phosphate being leached into water aquifers.

You should try to manage your manures so that you do not apply manures to soils with a phosphate Index of 4 or over. Where you have fields with a phosphate Index of 3 you should try to only apply the amount of manure that would supply the equivalent of the crop phosphate offtake – so that phosphate levels do not increase further.

However, you may be able to apply if you can demonstrate that it is not reasonably practical to comply with this – such as:

- You produce and apply manure on your own land, and there is no reasonable measure you can take to avoid it (e.g. export).
- You import manure as part of an integrated organic and manufactured fertiliser system, and cannot reasonably import manures that would not raise phosphate levels.

In practise, we think the former may be easier to argue, the latter will be harder to justify.

NUTRIENT MANAGEMENT PLAN

All farmers applying organic manure and/or artificial fertiliser must have a written Nutrient Management Plan. It must take into account soil analysis, crop need and the nutrients supplied by organic manures.

Farmers can formulate their own plan using RB209 or software such as Planet, or they can have a plan produced by a FACTS qualified adviser.

The plan must be updated annually to reflect changes in cropping and manure applications. **Tell us your plans for slurry and we will deliver this precisely!**

Field by field records showing cropping, and the timing of fertiliser and manure applications need to be kept at the end of each year too.

APPLICATION METHOD AND NITROGEN LOSSES

The benefits of shallow injection and boom spreading are well known. PM Joseph Ltd have the equipment to achieve significant increases in nitrogen use efficiency.

Combining state-of-the-art applicators with precise application rates means you get the best out of the slurry you apply. Here is an example of the savings that can be achieved in terms of additional available nitrogen.

Example: 30 cubic metres per hectare of 6% DM cow slurry applied in the spring.

	% N available to crop	KG available N per Ha	Extra available N per Ha
Surface Applied	35	27	0
Surface Applied & Incorporated	40	31	4
Shallow Injected ¹	45	35	8

¹ Boom spreaders applying under the crop canopy give similar results.

Paul says: "We've tried every possible option but time and time again we've gone back to the dribble bar and now we run 5. They're as quick as a splash plate, but you don't lose N through volatilisation".



THE IMPORTANCE OF GREEN COVER

Leaving soils bare in the winter increases the risk of soil erosion and nutrient runoff. The presence of a green cover over winter also helps to mop up nutrients from the soil at the end of the season. The cover crops can then be destroyed and provide nutrients for the following crop.

Land managers should **plan** to establish green cover by 15th October unless they are delaying drilling to control weeds such as blackgrass, or leaving medium and heavy soils to weather before a spring root crop.

MANURE MANAGEMENT PLAN

All farms with housed livestock must have a Manure Management Plan which shows that the farm has enough spreading area for the amount of manures being produced and needing to be spread.

The plan needs to include a Risk Map which **assesses the risk of spreading** on a field by field basis using the following key, **at the time of application**.

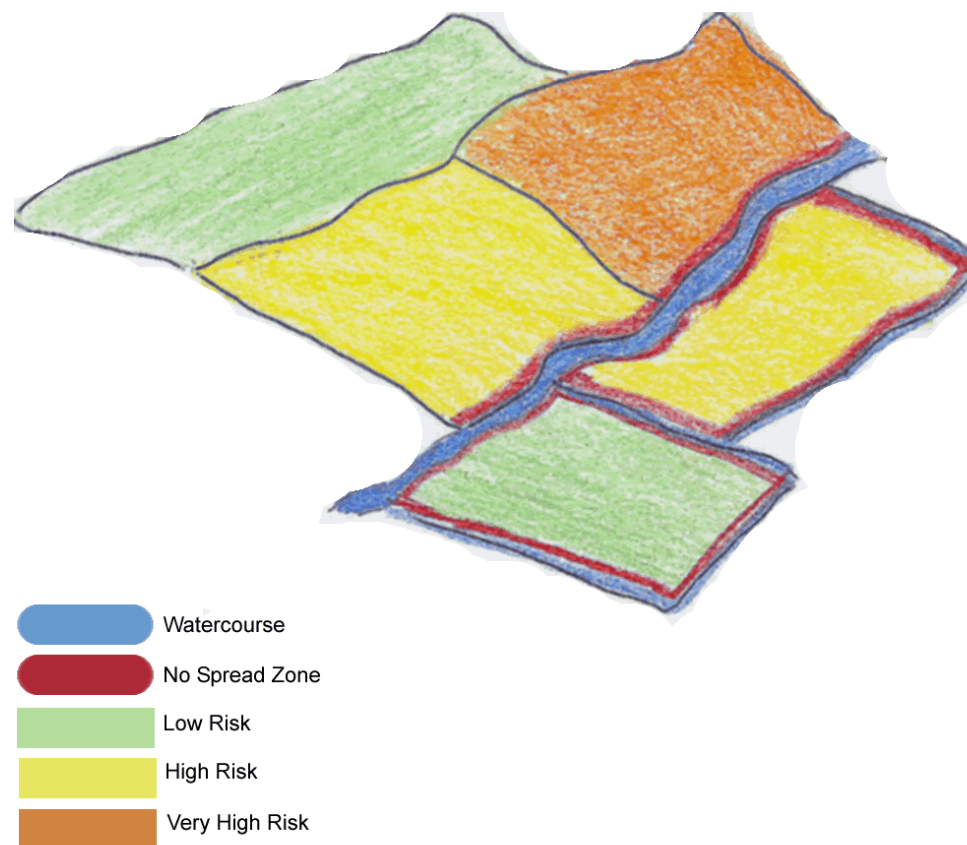
<p>Red</p> <p>No Spread areas</p>	<ul style="list-style-type: none"> Land within 10 metres of a watercourse (including piped ditches), or within 50 metres of a spring, well, borehole or reservoir. Very steep land. SSSI, ESA, SAS non spread areas. Footpaths, Tracks, Buildings, Woodlands 2m cross compliance strips on live boundaries <p style="text-align: center; font-weight: bold; margin-top: 10px;">THESE AREAS SHOULD NEVER BE SPREAD AT ANY TIME OF THE YEAR</p>
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<p>Orange Very High Risk</p>	<ul style="list-style-type: none"> • Areas next to watercourses that are severely compacted or waterlogged. • Areas likely to flood at sometime most winters. • Areas next to water courses, spring or bore hole when the soil is at field capacity in winter and there is: <ul style="list-style-type: none"> • A steep slope • A moderate slope and a slowly permeable soil • Newly drained or moled fields <p style="text-align: center;">DO NOT SPREAD ON THESE FIELDS WHEN THE SURFACE IS FLOODED OR COMPACTED, WHEN THERE IS A RISK OF FLOODING, OR WHEN THE SOIL IS AT FIELD CAPACITY</p>
<p>Yellow High Risk</p>	<ul style="list-style-type: none"> • Areas next to watercourses, spring or borehole when the soil is at field capacity in winter and there is: <ul style="list-style-type: none"> • A moderate slope and well drained soil • A slight slope and slowly permeable soil • All fields with effective pipe or mole drains. • Very shallow soils (<30cm) over gravel or rock. <p style="text-align: center;">THESE FIELDS MAY BE USED FOR SPREADING AT MOST TIMES OF THE YEAR, BUT APPLICATION RATES MUST BE NO MORE THAN 50 CU M/HA (4,500 GALLONS/ACRE). THERE SHOULD BE A 3 WEEK GAP BETWEEN APPLICATIONS</p>
<p>Green Low Risk</p>	<ul style="list-style-type: none"> • All other areas <p style="text-align: center;">MAY BE USED FOR SPREADING AT MOST TIMES OF THE YEAR</p>

Field capacity is defined as when soil becomes fully wetted and more rain would cause water loss by drainage. This normally happens in the winter 6 months.

EXAMPLE MANURE MANAGEMENT PLAN MAP

You must have a map like this:



NITRATE VULNERABLE ZONES

Farmers in NVZ areas also have to comply with additional regulations. This booklet provides a summary with the emphasis on manure application.

How do I know if I'm in one?

You can look online at the following link to see if you are in an NVZ area:

- <https://magic.defra.gov.uk/MagicMap.aspx>

Sources of Advice

1. You can call Douglas Green Consulting Ltd on 07970 942666 on all matters relating to Farming Rules for Water, NVZ, manure and slurry applications, and fertiliser planning.
2. The definitive guide of the NVZ rules is available to download at <https://www.gov.uk/government/collections/nitrate-vulnerable-zones>
3. Planet - DEFRA's fertiliser programme does the NVZ calculations too. It is free from www.planet4farmers.co.uk.

LIVESTOCK MANURE N FARM LIMIT

In any calendar year the amount of nitrogen in livestock manures applied to your land must not exceed 170 kgs N/ha/year across all the land you farm, including arable land.

Many intensive farms will need to make changes to qualify:

1. By exporting manures to another farm.
2. Reducing stock numbers.
3. Increasing land held.

The whole farm loading limit applies to both manures spread to land and manures dropped by livestock and includes both slurries and FYM and any digested sludge or manures imported/exported.

In the UK you can apply for a grassland derogation which allows you to increase the livestock manure N limit to 250kgN/ha. But in order to get this you must achieve the following:

- Have at least 80% of your farm in grassland.
- Comply with the 250kgN/ha limit from grazing livestock and the 170kgN/h limit from non grazing livestock.
- Apply annually for the derogation between 1st October and 31st December
- Prepare a nitrogen and phosphate application plan each year.
- Follow strict rules about ploughing up grassland.
- By 30th April in the following year provide the Environment Agency with records of stock number, imported/exported manures and artificial fertiliser use.

The amount of N you can apply to an individual field is different to the whole farm limit.

INDIVIDUAL FIELD APPLICATION RATES

The individual field limit is 250 kgs N/ha from organic sources in **any 12 month rolling period**. This limit excludes any N from manures dropped by grazing livestock. In practise this will mean the maximum application rates of organic manures in a rolling 12 month period will be as follows:

NVZ Maximum Individual Field Application Rates

Please note 1m³ = 1,000 litres = 1 tonne.

	DM %	Typical N content kg/m ³ or kg/t	250 kg N/ha limit equates to:	
			m ³ /ha	galls/ac
Dairy slurry	2	1.5	166	14,800
Dairy slurry	6	2.6	96	7,400
Pig slurry	4	4	62	5,500
Cattle FYM	25	6	40 t/ha	16 t/ac

CLOSED PERIODS IN NVZs

Closed periods now apply to all soil types in the NVZ. You must not apply high available N manures (slurry, poultry manure, liquid digested sludge) to the field during the following periods:

Soil Type	Grassland	Tillage Land
Sandy or Shallow	1st Sept – 31st Dec	16th Sept – 31st Dec for an Autumn sown crop drilled before the 15th Sept. 1st Aug – 31st Dec for non-Autumn sown crops.
Others	15th Oct – 31st Jan	1st Oct – 31st Jan

Please note the following:

- Shallow soils are less than 40cm deep.
- Organic producers may apply during these periods subject to certain conditions.
- There must be sufficient slurry storage on the farm to comply with the closed period.
- You must not apply more N fertiliser than the crop requires, taking into account the N applied as organic manures.
- This will involve keeping field records of all manures and fertilisers spread for a five year period.
- You have to demonstrate you have sufficient land on which to apply all your manures within the specified limits. See DEFRA publications/software regarding this or engage a consultant to assess.
- From the end of the closed period until the end of February you must not spread more than 30m³/ha slurry or 8 tonnes/ha poultry manure in a single application. And you must allow at least 3 weeks between applications.

OTHER ISSUES REGARDING THE APPLICATION OF MANURES IN NVZ

- Carry out the risk assessment and abide by the essential points covered in this booklet.
- Use low trajectory spreading equipment to avoid spreading slurry more than 4m in the air.
- Incorporation onto bare soils or stubble:
 - Poultry manure asap and within 24 hours.
 - Slurry and liquid digested sludge asap and within 24 hours unless applied by injector or dribble bar.
 - FYM (unless as a mulch to sandy soils) asap and within 24 hours if the land is sloping and within 50m of a watercourse that could receive the runoff.

MANUFACTURED FERTILISER APPLICATION IN NVZ

Closed Periods

Grassland	Tillage Land
15th Sept – 15th Jan	1st Sept – 15th Jan

There are exceptions within limits to a range of crops including grass and oilseed rape, or applications can be made on advice from a FACTS qualified advisor.

For grass you can apply 80kg/ha during the closed period, a maximum of 40kg/ha for each application.

Maximum rates of N from all sources, including available N from manures are set. The details are provided in the DEFRA booklets and on the website and include the following crops:

- Wheat: 220 – 280 kgs/ha
- Maize: 150 kgs/ha
- Grass: 300 - 340 kgs/ha

STORAGE REQUIREMENTS

You must have enough storage on your farm to cover the following periods:

	Outside NVZ's	In NVZ's
Pig & Poultry manures	5 months storage	6 months storage (1st Oct -1st April)
Cattle slurry	4 months storage	5 months storage (1st Oct -1st March)

You can use either Slurry Wizard (www.ahdb.org.uk/slurry-wizard) or Planet (planet4farmers.co.uk) to assess your storage needs.

The calculations take account of:

- The amount of excreta collected as slurry, as opposed to being dropped by animals grazing or in FYM.
- Groundwater or rainfall and parlour washings entering the store during the same period.

You can deduct from the requirement, volumes of slurry which are:

- exported from the farm.
- applied to land at low risk of runoff*.

*Low runoff land is that which:

- has a slope of less than 3 degrees.
- does not have land drains.
- is at least 50m from a watercourse.

Please note that closed periods still apply.

Field heaps of FYM should occupy as small a surface area as possible, and not be:

- within 50m of a spring, well or borehole.
- within 30m of surface water if the land slopes steeply.
- within 10m of surface water on flat land, or land likely to become waterlogged or flooded.

You need to rotate the site of your field heaps and record them on your risk assessment map. Field heaps should be moved every 12 months and you must leave a 2 year gap before returning to the same site.

TIPS FOR SLURRY APPLICATION BY UMBILICAL SPREADER

1. *Wet slurry put on little and often works best, it is easy to pump fast and achieve even application rates. Remember that the wetter the slurry, the higher the application rate.*
2. *Nitrogen from slurry is slow releasing. A February application will produce grass throughout the growing season.*
3. *NPK from slurry will pay your spreading costs when timed with crop growth periods.*
4. *Umbilical spreading gives many spreading options, for instance apply in spring for 1st cut NPK savings; silage aftermath to save or eliminate 2nd cut fertiliser; on ploughed ground prior to maize, and as a top dressing for arable crops in the spring.*
5. *Dribble bars are a practical route to trap maximum N without causing damage to crop root development and opening up swards.*
6. *Slurry can be an asset, not a liability!!*
7. *The non-spreading area adjoining watercourses for slurry spreading is reduced from 10m to 6m when applied using precision equipment such as dribble bars.*

WHY PM JOSEPH LTD?

Our investment in the latest equipment increases flexibility, efficiency, and our work rates significantly, allowing you to make significant savings in fertiliser applications, whilst achieving the best in crop nutrition.

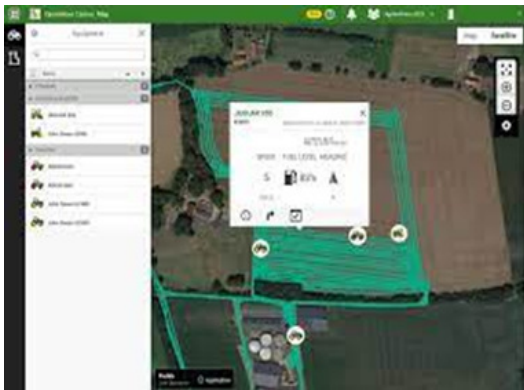


Applications by boom spreading and trailing shoe to increase the nitrogen availability without the need to incorporate.

Low Pressure Equipment preserves soil structure massively. Using umbilical systems and confining wheels to tramlines has a positive impact on crop yield and soil health.

Faster Work Rates reduces spreading cost per m³.

GPS and JD Operation Centre:



Flowmeters, telemetry and NIR analysis, coupled with our John Deere Operation Centre gives you access to your data on a field by field basis so you have accurate information on application rates and timings.

This helps you meet your compliance needs and also balance your slurry application and purchased fertiliser to meet crop needs.

PM Joseph Ltd

Agricultural Contractors



- Slurry Pumping & Tanking ●
- Forage Harvesting ● Baling ●
- Hay & Straw Sales ●



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Douglas Green Consulting Ltd

Douglas Green Consulting Ltd has a long and proven track record in the agricultural industry, achieving success by focusing on clients' objectives and needs, and by giving advice and recommendations to maximise profits and help businesses succeed and grow.

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Fully independent specialist dairy consultancy
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● Environment ●

Experts in environmental issues
Nutrient Management Plans, Manure & NVZ issues
FACTS qualified staff

Call us on 07970 942666

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Health and Safety

1. Please ensure that any undergrowth at the point where the pump will stand is cleared prior to our arrival.
2. Where the edge of the lagoon ends and the slurry starts, please mark with a fence post.
3. When we arrive, please arrange for someone to meet us and show us the ground.
4. Ensure that the access ladders to any slurry tower are safe, secure and available, and please show our staff where to leave them when the tower is unattended e.g. overnight.
5. Toilet and washing facilities would be appreciated.

Disclaimer: This report is prepared using the current understanding of the Environment Agency's interpretation of the Farming Rules for Water and Nitrate Vulnerable Zone Regulations. Some of these may evolve over time - such as the definition of dirty water versus slurry etc, and therefore it is important that farmers check the latest with their FACTS qualified consultant.