

The voluntary Farmer led approach to 'Nutrient management' project



Presented by: Lorna Davis MA hons / Nsch.

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Why water.....

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Project outline

Proposal

Explore options to develop a farmer led approach to delivery of water quality improvements, and reduce nutrient enrichments to water courses caused by N, P, and soil particles.

- **Whole industry engagement** into the design and delivery of the project
- **Raised awareness** of the benefits of nutrient management & water quality
- **Improved surface water, groundwater and soil quality** across Wales
- **Improved farm business resilience** to environmental and economic challenges
- **Water quality guidelines** to provide marketing opportunities for food production and public goods and services
- **Improved data collection** and evidence on impacts affecting water quality / quantity
- Create a **nationwide programme** to reduce the risks of nutrients impacting water courses and ground water supplies



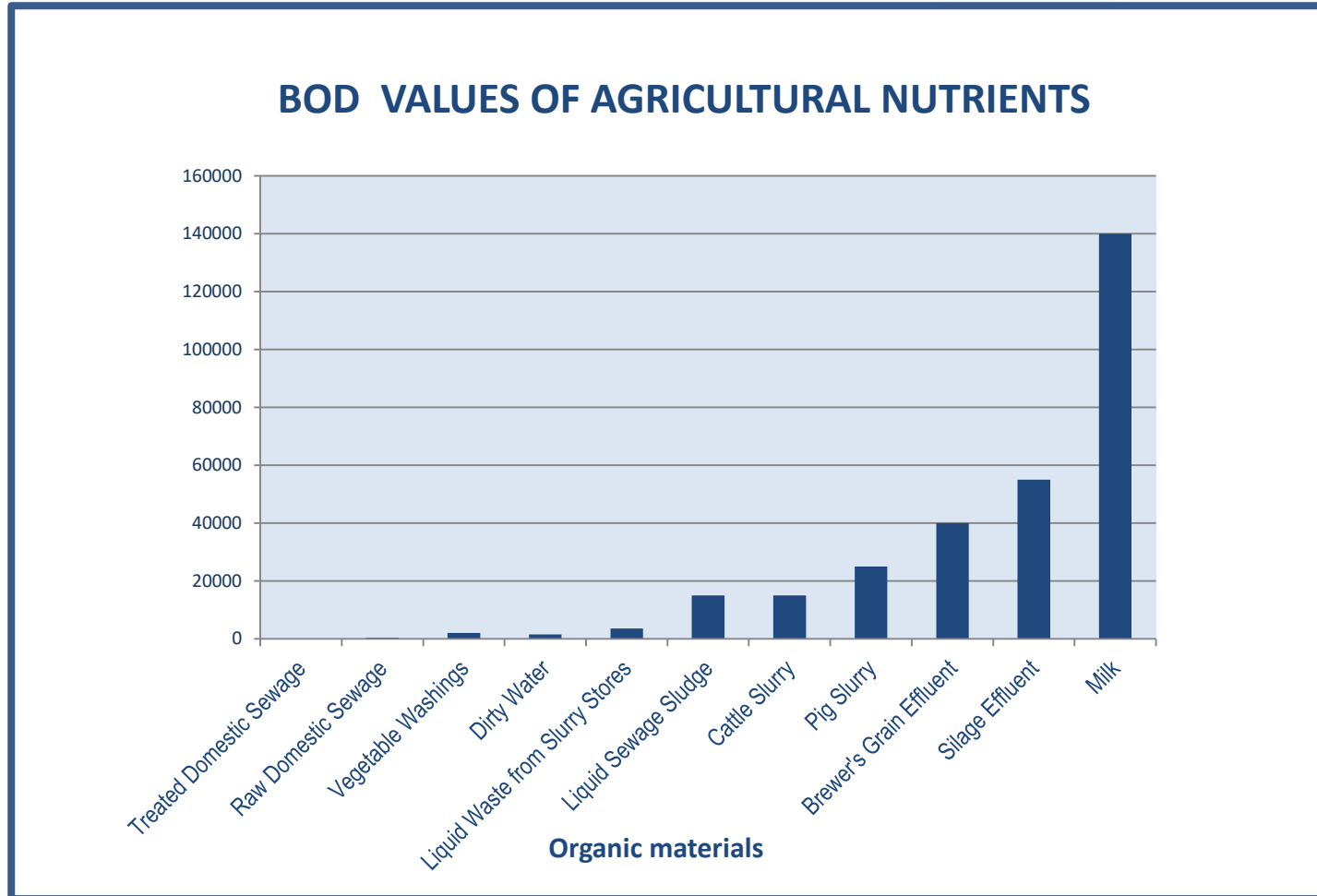
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Nitrogen content from RB209



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Nitrogen content from RB209

20.2 T Nitrogen
= 58.5 Tonnes Ammonium
Nitrate
@ £292/T
= **£17,083 Per annum!**
£85 per cow per year

	Volume of slurry produced per animal per month (m ³)
Dairy Cow 6000 – 9000 litres	1.59 (350 galls.)
Dairy Cow 9000 litres +	1.92 (422 galls)
Heifer 2 – 12 months	0.6 (132 galls)
Heifer 12 months - Calving	1.2 (265 galls)

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Managing risks on farm and in your catchment



Wales water's provide social, environmental and economic benefits to our communities, and culture. The farmer led approach aims to provide a structure to recognising agricultures efforts in protecting this valuable commodity for our environment, drinking water, food production and our tourism industry. Within the 'Water Framework Directive assessments of our waterways, diffuse pollution has been identified as one of the key impacts to our water environment.

Diffuse Pollution – Reducing the Risk

Agricultural pollution can take two forms:

- Point source pollution – from a single identifiable discharging source, such as a pipe or ditch.
- Diffuse pollution - caused by a variety of land management activities that have no specific point of discharge. Sources of diffuse pollution are often individually minor, but collectively can result in significant environmental impacts.



Point source pollutions

Model ref R.3. / R.4.

Point sources of pollution don't just occur on the farm yard, they can be out in the catchment too.

The location of your ring feeder or water trough can have a direct impact on water quality and nutrient levels within your rivers. A clean, reliable source of water is vital to all farms, environment and industries abstracting from our water bodies.

Clean and dirty water separation

Model ref R.1.

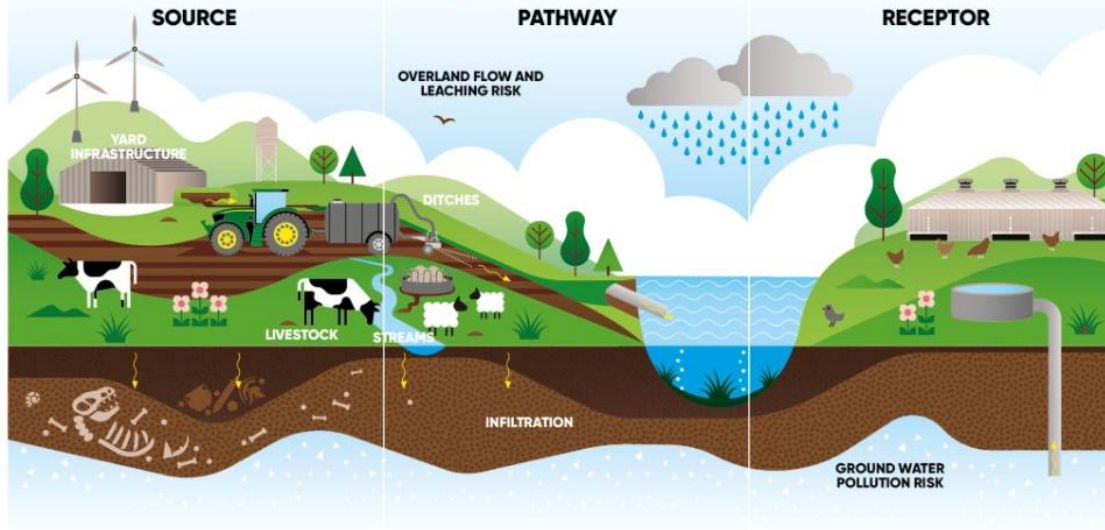
The amount of rainfall entering the slurry/dirty water system has a direct impact on your storage capacity and nutrient management costs. By managing your clean and dirty water systems you can deliver multiple benefits to your business.



Cropping

Model ref R.2.

Seasonal cropping can have a direct impact on water quality by the leaching of nutrients and soil runoff in wet weather.



Soils – Erosion, runoff and leaching of nutrients

Model ref R.5. / R.6. / R.8. / R.9.

The effects of small sources of erosion and/or poaching is cumulative in a catchment. What appears to be small amounts of runoff from one field, when added to all the other sources that also feed into that stream or river can have a big overall effect on water quality within a catchment.

QUICK WINS

Identify erosion risks within your farm, removing these risks can deliver 'quick wins' to reduce pollution risks and improve water quality on farm and within the surrounding rivers.



Nutrient management

Slurry is highly polluting if it ends up in the wrong place like watercourses. Excessive nutrients to land or a leaking slurry store can cause serious pollution.

These nutrient losses into water courses have an environmental and economic impact to your farm business.



FACT

Across the UK it is estimated that 2.9 million tonnes of soil is eroded each year.

FACT

It can take upto 500 years to replace 1 inch of topsoil.



The Water Standard



1.0 Nutrients			Benefits						
No.	Item	Outcome							
1.1	<p>Nutrient and manure management planning: If you have already produced a nutrient management plan you may wish to check it is clearly set out and includes the steps in this chapter. The "Tried and Tested" plan is an example of a NMP that will meet all the advice and criteria set out below. See Tried and Tested Nutrient management Plan guide for advice: http://www.nutrientmanagement.org/2-nutrient-management-plan/</p>	<ol style="list-style-type: none"> 1. Undertaking soil analysis every three to five years depending on the cropping system. (See Sec.1.10 for more information) 2. Undertaking an 'active' NMP by adjusting inputs of lime and phosphate, potash, nutrients and evidencing on field record sheets / programme. 3. Assess the nutrient requirement of the crop using a recognised fertilizer recommendation system. 4. Assess the nutrient supply from organic manure. This can be done through a number of methods including RB209. An example of this is found at the following link. https://media.ahdb.org.uk/media/Default/Imported%20Publication%20Docs/RB209%20Organic%20materials.pdf 5. Undertake a fertiliser nutrient needs calculation by deducting the contribution from organic manures from the crop nutrient requirement. This should be evidenced within your NMP. 	•	•			•	•	
<p>Undertake and maintain accurate field records of all cropping and applications of fertilisers, livestock manures and organic manures annually. Update the plan at the start of each cropping year. <i>This information will help inform future decisions on nutrient management and demonstrate the practical outcome of the plan.</i></p>									
1.2	<p>Manure and slurry storage: Slurry and manure from both housed and livestock can make a significant contribution to the nutrient status of your land. By ensuring nutrients are stored in well sited locations away from any water courses you can ensure you can preserve nutrient value whilst also reducing the potential of pollution.</p>	<p>Ensure the location of your nutrient storage, such as field heaps and temporary mobile tank or on land stores does not pose a risk to water quality. Check it is not;</p> <ol style="list-style-type: none"> 1. Within 10 metres of any – river, stream, ditch, pond or lake from the top of the bank 2. Close to a wetland, Transitional water or coastal water as measured from the shoreline 	•	•			•	•	

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The Water Standard - sources

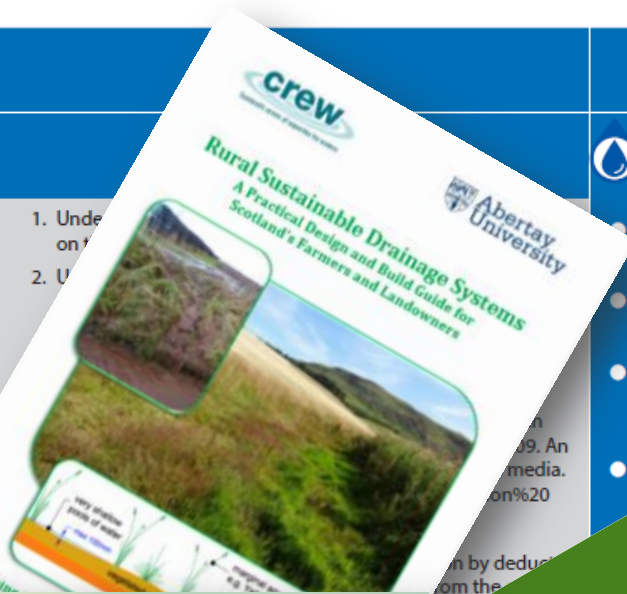


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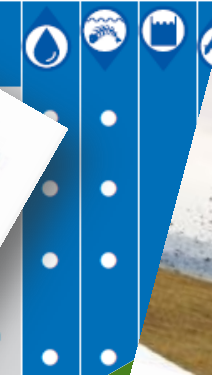
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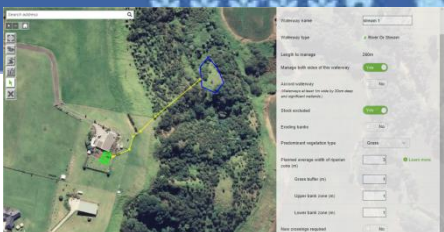
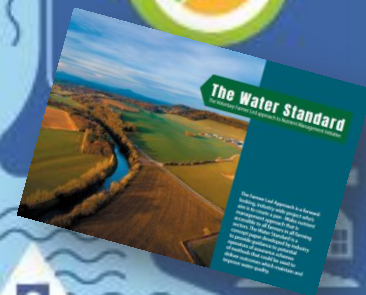
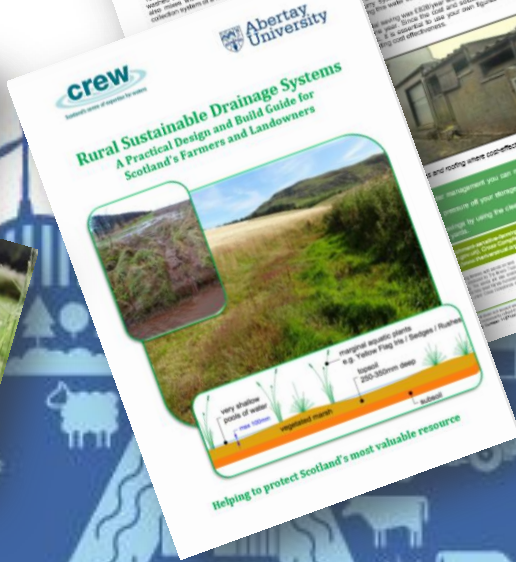
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The 5 Steps...



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The farmer led approach...Opportunities.



Managing your nutrients well.

Understanding the soil and the nutrient value of your farming system is vital to understanding your impacts on the environment and improving your business efficiency whilst reducing risks to water quality across Wales.

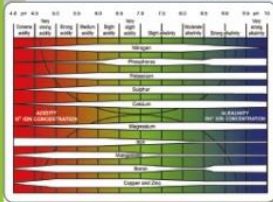
Farmers wishing to maximise crop yield potentials, while also streamlining costs should look at matching nutrient inputs (fertilisers and organic manures) to crop demand so;

- yield is optimised
- nutrient use is minimised
- minimises N, P, and soil losses to the environment

Know your soils

Model ref B.1.

Only 30% of the soils in Wales are thought to be where they should be in terms of pH. Knowing your soils enables you to manage nutrients more effectively.



APPT

Apply the right
Amount
Using the right
Product
In the right
Place
At the right
Time

Checklist

- soil sampling
- soil compaction tests
- nutrient management plans
- Risk maps
- Knowledge sharing

Including soil supply + organic manures (livestock manures, sewage sludge, digestate, compost and industrial waste) residual nitrogen in your soil

Know your catchment

Where a water body is failing due to diffuse rural pollution you can find out from the Natural Resources Wales's online Water Watch Map Gallery. This is a web application to help explore and obtain detailed information about local catchments and individual bodies of water.

Access Water Watch Wales at <https://waterwatchwales.naturalresourceswales.gov.uk/>

Measuring the cumulative effects of managing nutrients on farm and changing behaviours within the industry demonstrates the value water quality has to our sector. This allows agriculture to benchmark its performance against other potential polluters and capture the multiple benefits good farming practices deliver, on farm, and within our water courses.



Environment

Model ref. B.2. / B.3. / B.5. / B.6.

Maximising environment within your farm can deliver multiple benefits to water quality and provide opportunities in the future for accessing public goods and services. Consider some of these environmental solutions to help you manage your nutrient risks, such as:

- Habitat corridors
- Buffer strips
- Wetland areas
- Field margins
- Tree planting and habitat creation
- Soil health
- Water quality



Why focus on nutrients....

Model ref B.1.

$$\text{Fertilizer needed} = \text{Crop requirement} + \text{Nutrients from other sources}$$

By working with nutrient management on your farm multiple benefits can be delivered to your business and the environment. Understanding the soil and nutrient needs of your farm enables you to match nutrient inputs (fertilisers and organic manures) to crop demand. This increases flexibility and resilience for your business allowing you to spread slurry and manure at the best times and have peace of mind that your farm is not at risk of polluting your land and the wider environment.

Benefits....

- Reduced environmental risks due to field losses of excess nutrients
- Best value from fertilisers and organic manures used
- Enhanced crop yield and quality
- Potential cost savings when all nutrient inputs are accounted for
- Improved crop and livestock performance from a balanced supply of nutrients

FACT

Rivers drain nearly **75%** of the earth's land surface.



HOW FARMERS IMPROVE SOIL HEALTH ALL YEAR ROUND

WINTER

BUFFER STRIPS ON FIELD MARGINS

- ✓ Act as a barrier to reduce wind erosion in bare soils.



LIVESTOCK HOUSED INDOORS OVER WINTER

- ✓ Reduces soil erosion and poaching in wetter months.



ANNUAL CROP ROTATION

- ✓ Maintains soil fertility.
- ✓ Helps replenish nutrients.
- ✓ Helps to control weeds.
- ✓ Reduces crop specific pest and disease problems.

SPRING

SPREADING OF SLURRY AND FARM YARD MANURE

- ✓ Less requirement for artificial fertilisers.
- ✓ Helps increase organic matter and encourages earthworms.



COW TRACKS AND MULTIPLE GATEWAY ENTRY

- ✓ Multiple gateways helps reduce soil compaction.
- ✓ Cow tracks avoid poaching.



GRASS LAND SOIL CAN BENEFIT FROM AERATION

- ✓ Aeration improves soil drainage & helps keep soil aerobic.



SOIL SAMPLING AND VISUAL ASSESSMENTS

- ✓ By monitoring, measuring & managing soil health, farmers ensure that plants get the nutrients needed and earthworms are encouraged.



62% OF AGRICULTURAL LAND IS PERMANENT GRASSLAND & MEADOW

Acting as a permanent carbon storage area, this locks in greenhouse gases otherwise emitted to the atmosphere.



SUMMER

CONTROL TRAFFIC FARMING, GPS & REDUCTIONS IN TYRE PRESSURES

- ✓ Reduces soil compaction, fuel consumption and the need for traditional cultivation methods.



450,000 KM OF HEDGES IN THE UK

- ✓ Hedges act as a barrier to help reduce wind erosion.



STRAW CHOPPING AT HARVEST TIME

- ✓ Helps increase the soils organic matter content to help for the next crop.



AUTUMN

COVER CROPS AND CATCH CROPS

- ✓ Prevent post-harvest soil erosion, helps increase organic matter and rooting systems.
- ✓ Improves soil structure and infiltration.



DIRECT DRILLING OF WINTER CROPS FOLLOWING HARVEST USES A MINIMUM-TILLAGE METHOD

- ✓ Min-till or no-till methods mean fewer soil disturbances & increases in organic matter at the top level of soil.



Lorna Davis

Nutrient management programme
project manager

MAN — DESPITE HIS ARTISTIC PRETENSIONS,
HIS SOPHISTICATION, AND HIS MANY
ACCOMPLISHMENTS — OWES HIS EXISTENCE
TO A SIX INCH LAYER OF *topsoil*
AND THE FACT THAT IT

rains.

- UNKNOWN

*Thank you
for listening.*

