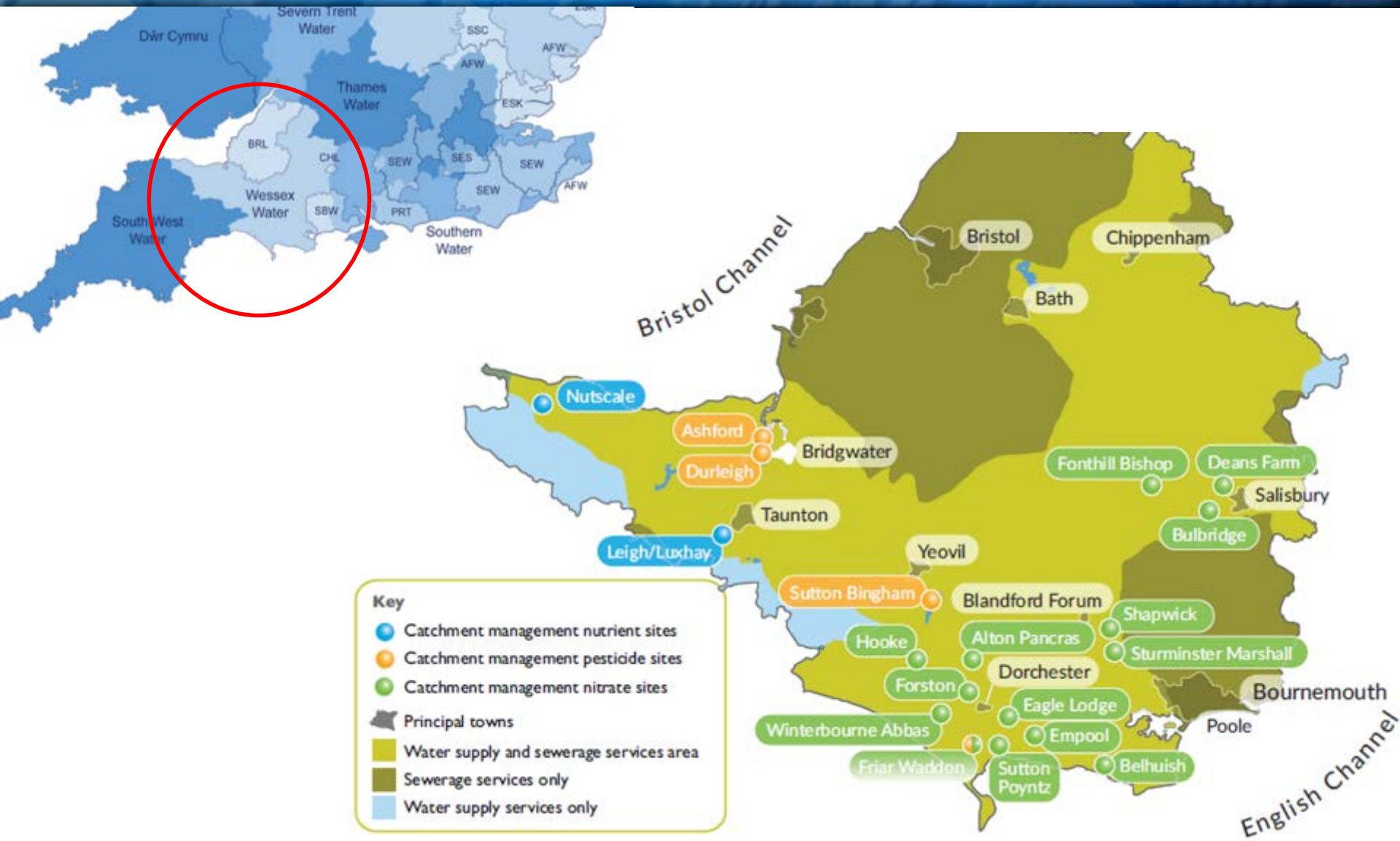


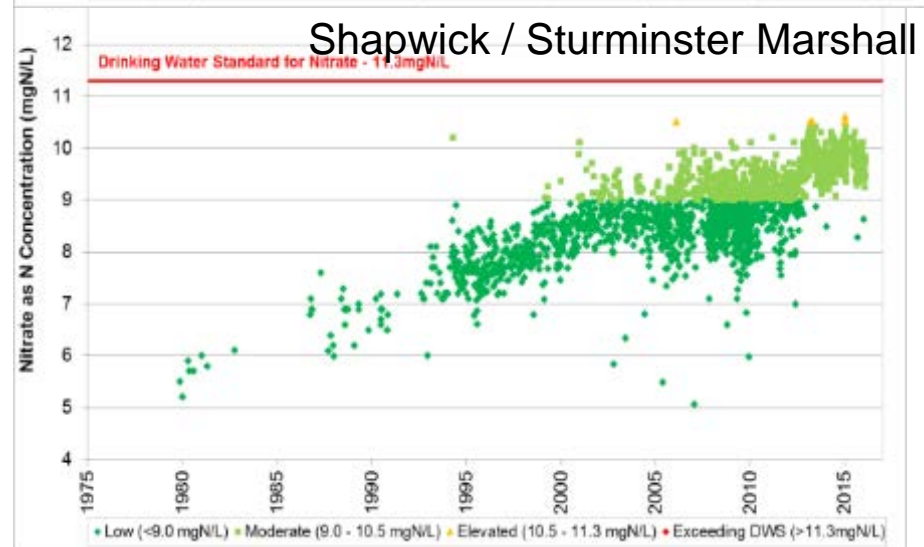
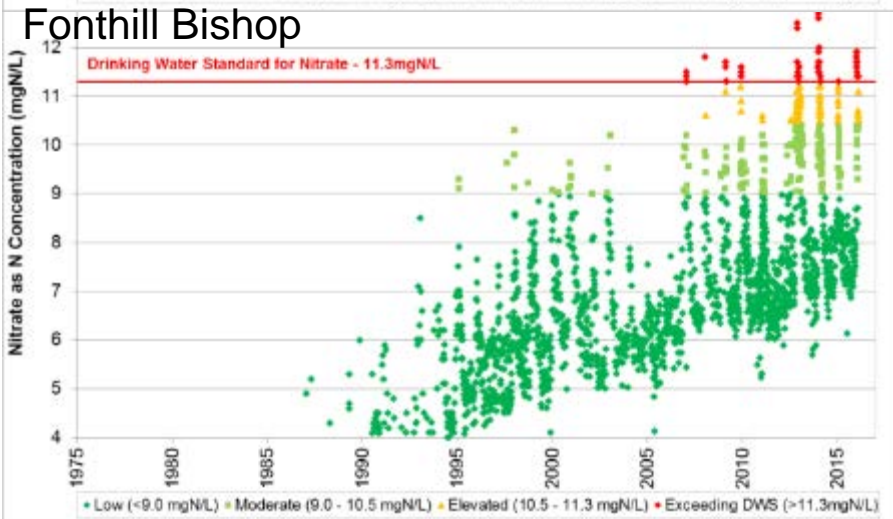
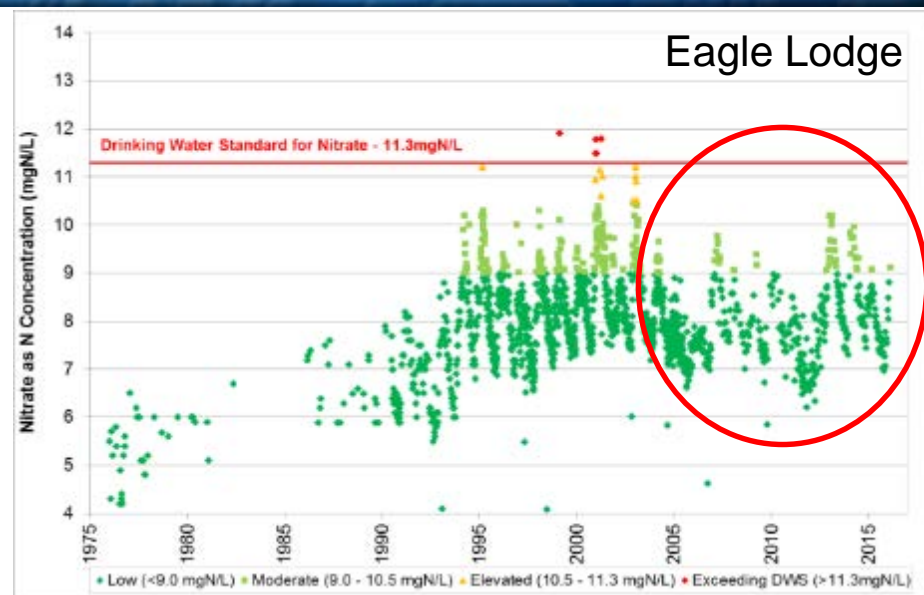
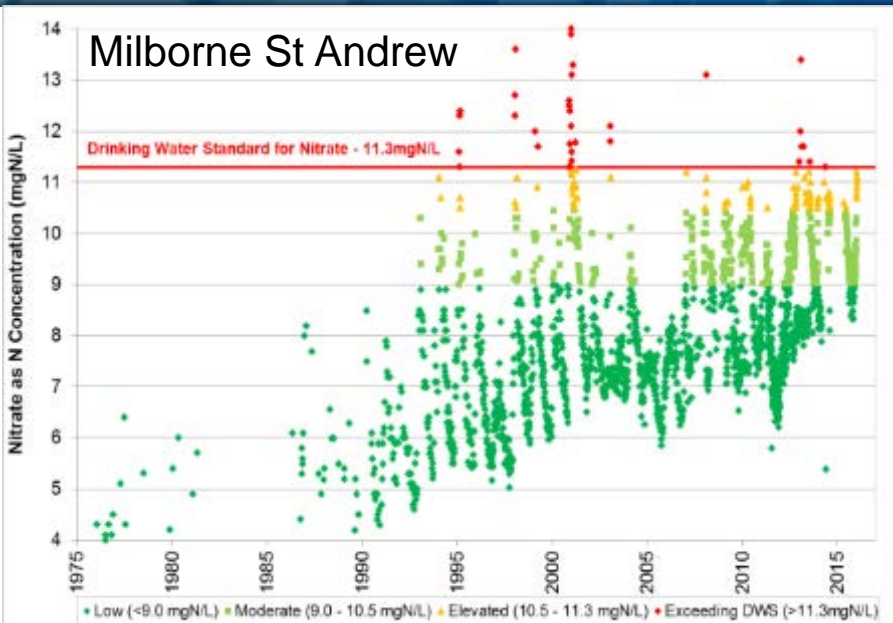
**Wessex Water**  
**catchment management:**  
***Farmer engagement and diffuse***  
***pollution reduction measures***

**Tim Stephens NSch**  
**Senior Catchment Adviser**  
**Wessex Water**  
**September 2017**

# Where we are working



# Nitrate trends



# Catchment Management scope



- **Nitrates, pesticides and microbes in groundwater since 2005**
- **Pesticides and nutrients in surface water since 2005**
- **Poole Harbour nitrogen offsetting since 2015**
- **Bristol Avon phosphorous offsetting since 2017**

# Poole Harbour Nitrogen Offsetting



- **Nitrogen: External Drivers for Change**
  - **Nitrate Vulnerable Zone - Since 2002**
  - **Poole Harbour SPA, SAC, RAMSAR**
  - **Failing Habitats Directive**
  - **Judicial Review: Potential for Water Protection Zone?**



# Our aims and our approach

- Aim is to support farmers to reduce nitrate leaching to 24.5 kgN/ha across their farm (75% of the DWS)
- Methods of engagement:
  - One to one advice & support
  - Events
    - Field demonstrations and on-farm trials
    - Talks to farmer groups
  - Training events
  - Media
  - Partnership approach (CSF, EA etc)



**Arable** magazine cover featuring a photo of a farmer and a tractor. The headline reads: "Mild winter brings fertiliser cut for spring barley and maize growers".

**LOOK OUT FOR**  
A cover crops and no-till future p40  
Top seed spuds from Yorkshire p42  
Meat how meat used to taste p78

Edited by Richard Allcock | 020 8652 4834 | richard.allcock@ytl.co.uk

**By Oli Hill**

Donset grower Joe Foor is set to cut his fertiliser use on his spring barley and maize this season due to high soil nitrogen mineralisation after a mild winter and benefits from cover crops.

This spring he hopes to cut bagged nitrogen applied to his spring barley by 25kg/ha and maize by 30kg/ha to save limited money after receiving soil nitrogen test results.

For the past decade, Mr Foor has been analysing soil mineral nitrogen and the nutrients in livestock manure with the aim of not buying in phosphate and potash fertiliser and cutting bagged nitrogen use.

"Receiving the nutrient content of what we are applying gives us the confidence to reduce bagged nitrogen applications over time," he tells *Farmers Weekly*.

He runs a mixed farm with his brother, which grows across 1,700ha between Dorchester and Weymouth, with 800ha of combinable crops, 800ha of maize, 500ha of potatoes and a 960 dairy cow unit.

"We try to be as precise as we can in terms of nutrient management and spreader calibration. We have our truck analysed so we know what's going on to the crop and this helps us cut our artificial nitrogen use," he adds.

Yield mapping is also used at Bayard Chazy farms to offer scope for dialling nitrogen application rates in the future.

Wessex Water catchment adviser Tim Stephens has been examining soil mineral nitrogen (SMN) levels from about 300 mostly arable fields stretched across Dorset and also Wiltshire.

From last autumn to this spring, the average nitrogen in soils has almost halved, to 62kg/ha – just shy of the national 65kg/ha average.

Mr Stephens notes that rainfall in the Wessex area from November to February has been significantly above the long-term average, resulting in higher nitrogen leaching.

Despite this, half of all available nitrogen is in the top 30cm of soil – far higher than the UK average for this spring.

On average, some 31kg/ha of nitrogen will be available to spring drilled crops in the Wessex catchment, compared with the UK average of only 20kg/ha.

"You have to look at SMN results in context of averages and then they are a good indicator of nitrogen levels in soil," says Mr Stephens.

"The end-user is soil nitrogen over winter is about average for the last. Nitrogen losses vary on what crop is in the ground and crop management," he adds.

This is when Mr Foor's oil radish and phacelia cover crop comes in. This crop contains 40kg/ha of nitrogen and Mr Stephens estimates half of this will be available to the following maize crop.

**NO ONE RULE FITS ALL FOR UK THIS SPRING**

Frontier's fertiliser technical manager Mike Satter, picks a split picture of nitrogen levels in soils around the country, based on the company's SMN test results.

Soil temperatures in southern and western parts of the UK only rarely fell below 5C over the winter, delivering more nitrogen and sulphur mineralisation, he explains.

Meanwhile, eastern and northern regions have had good falls, lower soil nitrogen levels due to colder temperatures since the start of the year and rainfall leaching nitrogen further down the soil profile.

Winter crops that are yet to receive a nitrogen application are looking hungry and will need an application as soon as possible, but there could be potential to save on fertiliser applications in many forward drilled crops, he says.

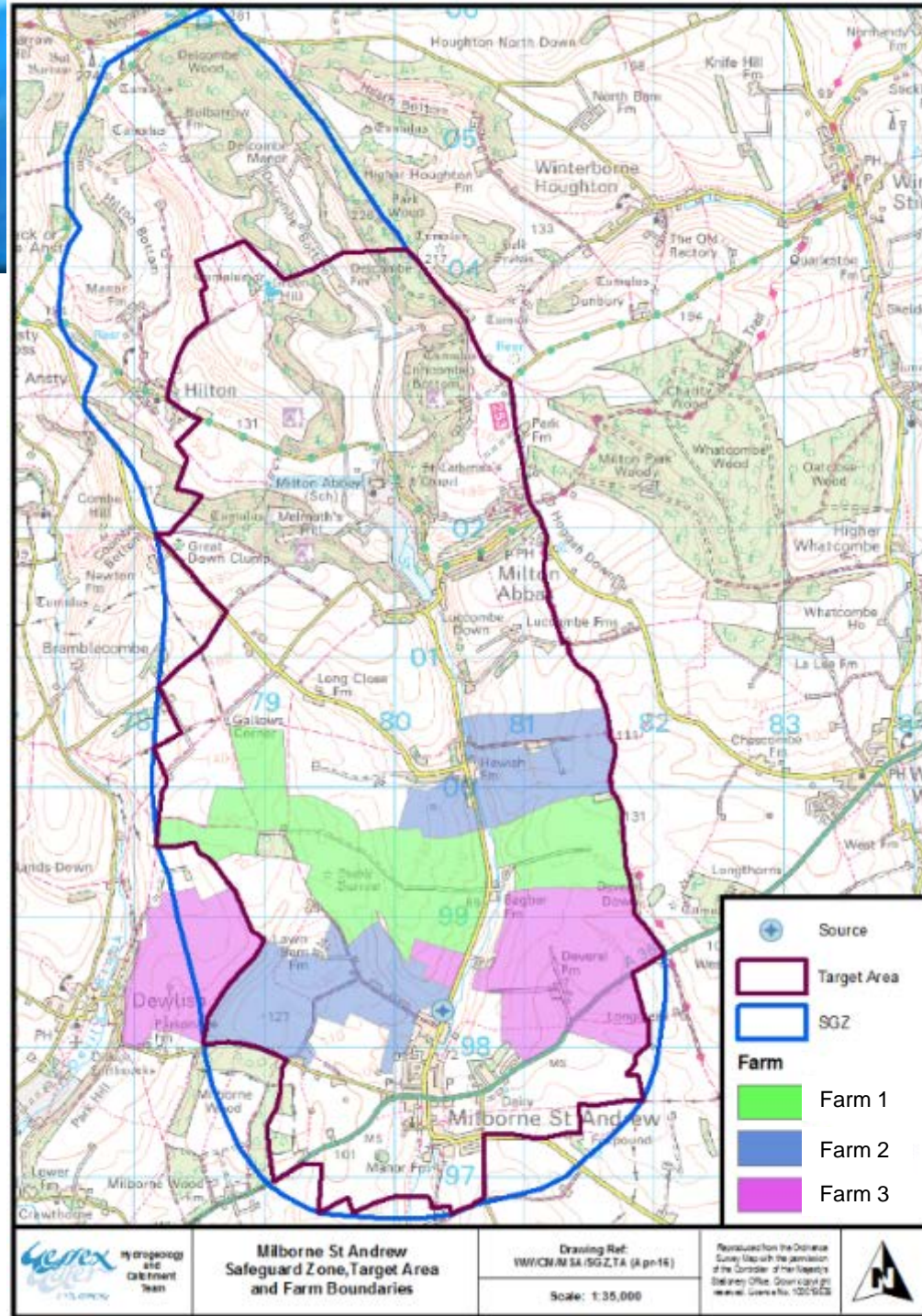
But Mr Satter warns that results from earlier testing may now prove a slightly optimistic picture that could mislead growers' fertiliser decisions making.

"Tests in January showed nitrogen levels were generally higher than average, but tests in February and March showed figures have declined," he says.

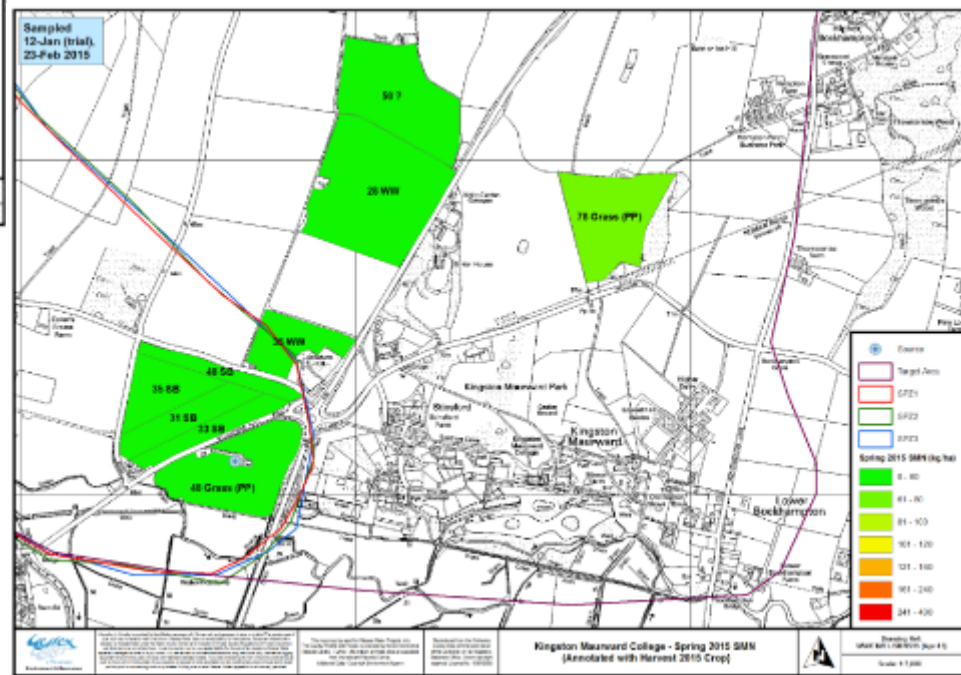
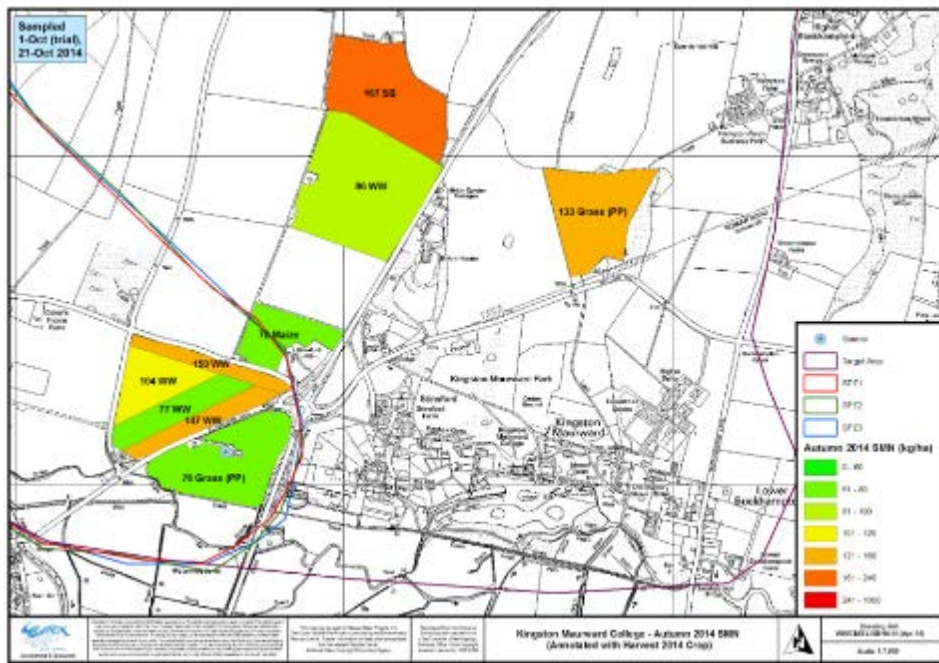
"Now the top 30cm of soil has lower nitrogen levels than the long term average and this may mean spring-drilled crops through if growers are basing their application on last results from earlier this year," he says.

# Our methodology

- Source apportionment and identification of high risk farms / fields
- Capture fraction modelling
- Review of SGZs and assign target areas
- Allocate budgets according to:
  - Risk to supply of failure, nitrate status, catchment size and land-use
- Link to new reporting structure
  - Quantifying our targets and achievements in kgN/ha prevented from leaching



# Soil Mineral Nitrogen (SMN) Sampling

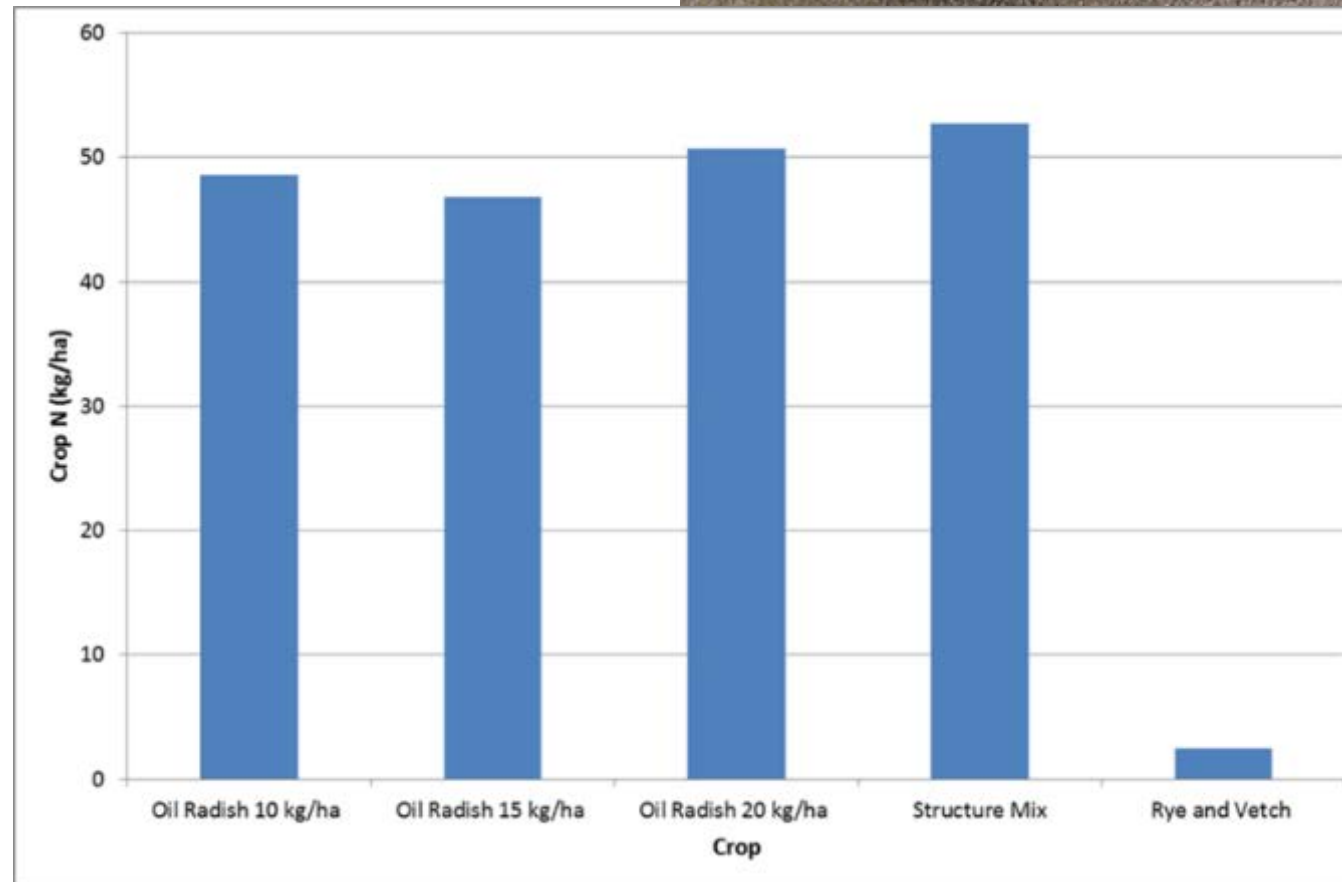


# Porous Pots



# Sampling services offered to catchment farmers

- Crop N & P content
- Slurry testing
- Grain N



Crop nitrogen uptake during winter 2015/16 – Deverel Farm trial

# Cover crop trials – winter 2016/17



**Deverel Farm**  
- Oil radish variety comparison



## **Kingston Maurward College**

- multi-species comparison
- oil radish variety comparison
- drilling date comparison

Oats & turnip rape mix



Westerwolds



Rest of field



Oil radish



Turnip rape



Outdoor pigs soil management trial



18-25 kgN/ha on 3<sup>rd</sup> Jan

27 kgN/ha on 3<sup>rd</sup> Jan



**Maize undersowing trial. Hurst Farm, nr Dorchester**

IRG in slurry  
 >>>>>>>>

IRG with Einbock  
 <<<<<<<<<<

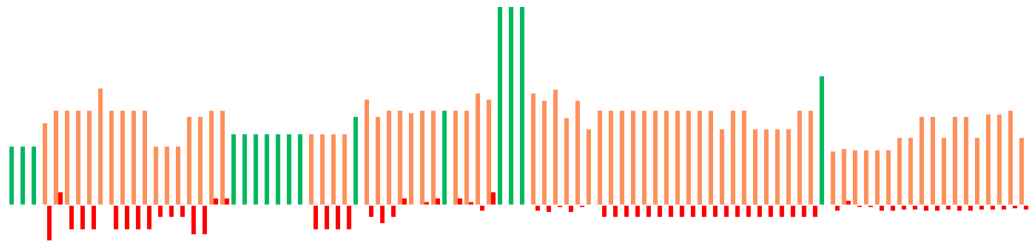


<b>Practice</b>	<b>Area funded in GW SGZs in 2016/17 (ha)</b>	<b>Effective-ness (kgN/ha)</b>	<b>Total N saved (t)</b>
<b>Cover crops</b>	<b>1,305</b>	<b>30</b>	<b>39.2</b>
<b>Catch crops</b> (i. between pulses and w. wheat <i>or</i> ii. retain OSR volunteers as catch crop)	<b>10</b>	<b>20</b>	<b>0.2</b>
<b>Arable reversion to zero/low input grass</b>	<b>41</b>	<b>45</b>	<b>1.8</b>
<b>Delay reseeding until spring</b>	<b>83</b>	<b>20</b>	<b>1.7</b>
<b>Crop substitution</b>	<b>141</b>	<b>20</b>	<b>2.8</b>
<b>Early harvest of maize</b>	<b>193</b>	<b>5</b>	<b>1.0</b>
<b>Reduced N applications to winter wheat</b>	<b>15</b>	<b>10</b>	<b>0.15</b>
<b>Fertiliser spreader calibration</b>	<b>tbc</b>	<b>0-5</b>	<b>tbc</b>
<b>Avoid spreading slurry in January</b>	<b>tbc</b>	<b>tbc</b>	<b>tbc</b>
<b>Infrastructure improvements</b>	<b>variable</b>	<b>variable</b>	<b>variable</b>
<b>Farmer innovation grant</b>	<b>variable</b>	<b>variable</b>	<b>variable</b>

# Entrade Online Auction

## Bidding revisions

Last 36 hours of auction – bid price in £ per ha



## Why an online auction?

- An administrative tool to assist in reaching Wessex Water's catchment management objectives
- Move the focus to **£/kg of N** not **£/ha**
- **Farmers set their price**, not Wessex Water

EnTrade Logged in as: Laura.Horne@WVW.co.uk (logout) Contact Entrade

You can submit your bid here. Enter the details below (Items marked \* are mandatory). Read the terms and conditions and submit your bid.

**Create/update bid**

Select your field \* RC11

Selected field Please check that this information is correct. You will not be able to change the field information once this bid is submitted.  
Field size: 15 ha - Underlying material: Chalk - Soil Texture: Freestone G

Select your cover crop \* Forage Ryegrass

Crop sowing date \* 20/03/2015

Crop destruction date \* 20/03/2017

Method of establishment \* Roll mixed - Cultivated

Price (£/ha) 65

Total price (£) 975

N Savings (kg N) 450

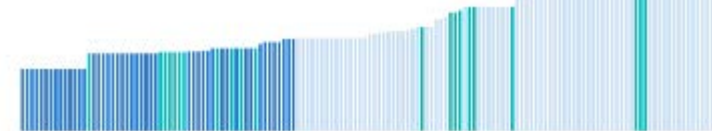
£/kg of N 2.17

If you are planting a robe of cover crops please detail below.

Terms and conditions

Ineligible via EnTrade bid

Bids ordered by £ per kg of N



Bids ordered by £ per hectare



# Dorset Maize Charter



- Engage more farmers and
- Engage current farmers further (if in target areas) by:
  - One to one advice
  - On farm events and demonstrations
  - Newsletters and press coverage
- Develop new funding schemes (and refine current ones)
- Extend and refine evidence base for effectiveness of measures
  - Wessex Water monitoring
  - Partnerships with other research and knowledge transfer organisations

**For more information, please contact:**



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**[www.wessexwater.co.uk/catchmentmanagement](http://www.wessexwater.co.uk/catchmentmanagement)**