

NMP online

A tool to support water quality improvement in Ireland



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7th November 2019

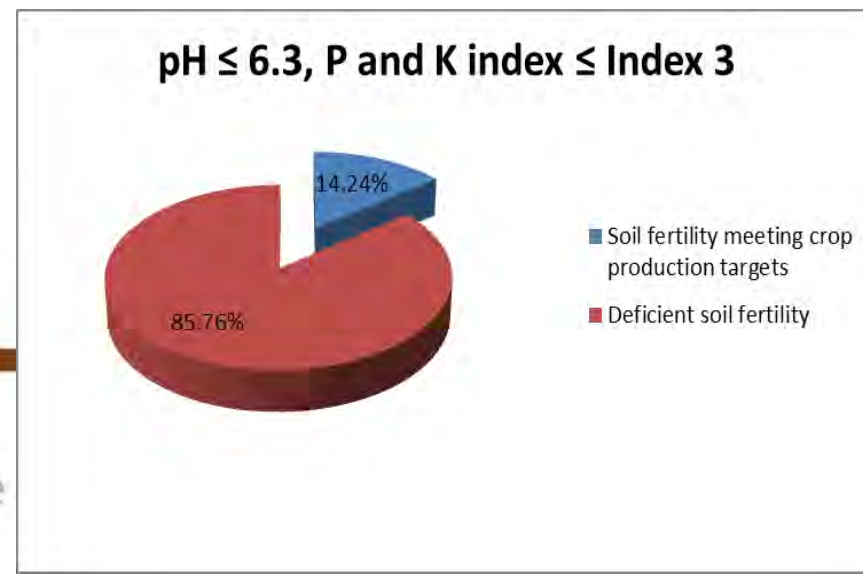
Agriculture in Ireland

- ~ 4.5 million hectares (of a total of 6.9 million hectares) is dedicated to agricultural land
- 92.1% grassland
- Livestock production is the primary type of farming conducted
- 137,100 family held farms
- The average farm size: ~ 32.5 hectares
- 41,200 farmers are age 65 and over, 7,400 are under 35



Soil Fertility

- Only **14.24%** of soils sampled had agronomic optimum soil fertility levels (11.6% in 2016)
- **84.16%** of soils sampled had a deficiency in at least one parameter
- Low pH continues to be a major issue in Irish soils, limiting nutrient availability and use efficiency. Lime usage has decreased significantly since the 1970's.



Farmer challenges

- Need to achieve improvement in Water Quality
- Need to reduce GHG and Ammonia emissions – Improve N efficiency
- Achieving good nutrient status for crop production
- Regulation
 - Farm gate balance for P and limits on N related to stocking rate
 - Regulation at Farm Level – Makes individual plot allowances complicated
 - Complex calculation system
- Fear of Regulation and Penalties
- Increased cost of Fertiliser and Income under pressure

NMP Online

- Began with compliance
- Today we believe that it can deliver much more
 - Water quality
 - Emission reduction
 - Soil Fertility
 - Quality of Planning (farm level and policy level)
 - Efficiency for Advisers
 - Delivering Change
 - Research/Data

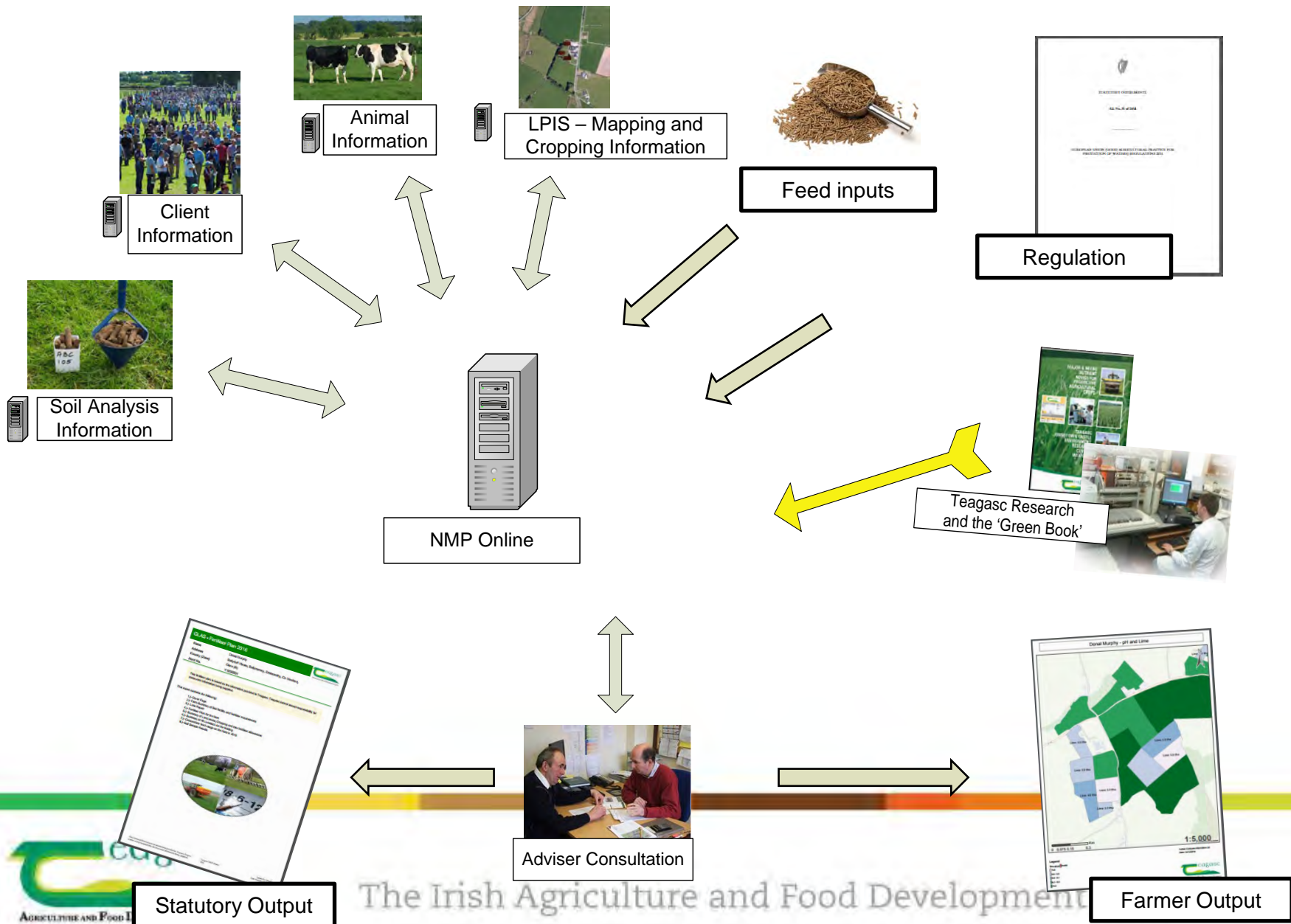
But First

What is NMP Online

NMP Online – A collaborative Project

- Developed by Teagasc (Agriculture and Food Development Authority)
- Open to **ALL** users – Private and Public Advisers
- Supported by Department of Agriculture Food and the Marine
 - Agri Environmental Schemes
 - Derogation Plans
 - Data Provision to improve efficiency
- Supported by Industry – Sustainability Initiative

NMP Online Data Sources



LINKED GIS Layers

- Layers
 - OSI
 - Ortho
 - Soil Database
 - Subsoil
 - Forestry
 - Commonages
 - Yard Map



DATABASE Stats

- Took three years to develop
- Available to users since mid 2016
- Users 800
 - 250 in Teagasc
 - 550 – Private Consultant and Industry
- Plans
 - 65,000 – Farmers
 - GLAS – 50,000
 - Derogation – 5,500
 - Other 10,000
 - Total Plans on System - >200,000

DATABASE Stats

- 200,000 Plans
 - Average 10 Plots
 - Average 7 Soil Samples
 - Average 2-3 Categories of Animals
 - 10,000 with Storage
- Planning Phase 2 and 3 to broaden capabilities of the system
- Success will be measured by contribution to output and environmental objectives

NMP

NMP's will deliver:-

- improved water quality and break the pathway
- improved farm efficiency and profitability,
 - increased grass growth,
 - reduced inputs,
- reduced GHG's / Ammonia

Win Win

NMP's must be easy to understand & implement

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Compliance

4th Nitrates action programme (NAP) (2018-2021)

Main measure to prevent pollution of water from agricultural sources under the WFD

- Storage requirements
- Spreading dates
- Fertiliser plans
- Rates N and P/ha per crop
- Additional Allowances
- Soil type
- Record keeping



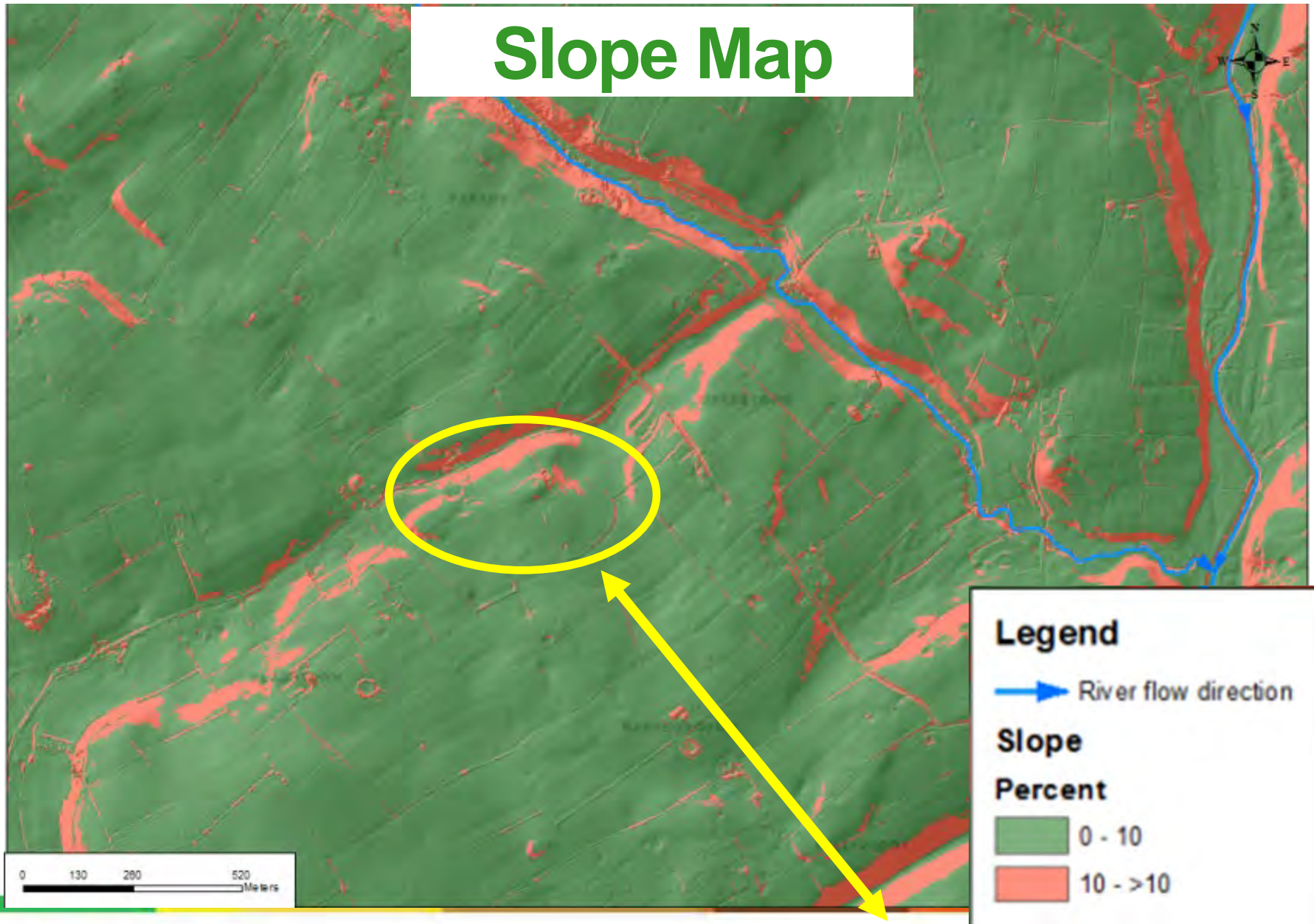
Water Quality

NMP Online

- As a result of enhanced planning, implementing of best practice in terms of application of nutrients
 - Right product
 - Right time
 - Right place

- Future opportunity
 - Identification of critical source areas for specific management
 - Identification of point sources
 - Integration of research findings (for advisers and for farmers)

Slope Map



Critical Source Area's

- Heavy clay soil
- Slopes from other fields into this area
- Prone to occasional flooding



Need to consider sloped fields near watercourses and drains



**Not all the field may be
an issue just the CSA/
sloped areas**

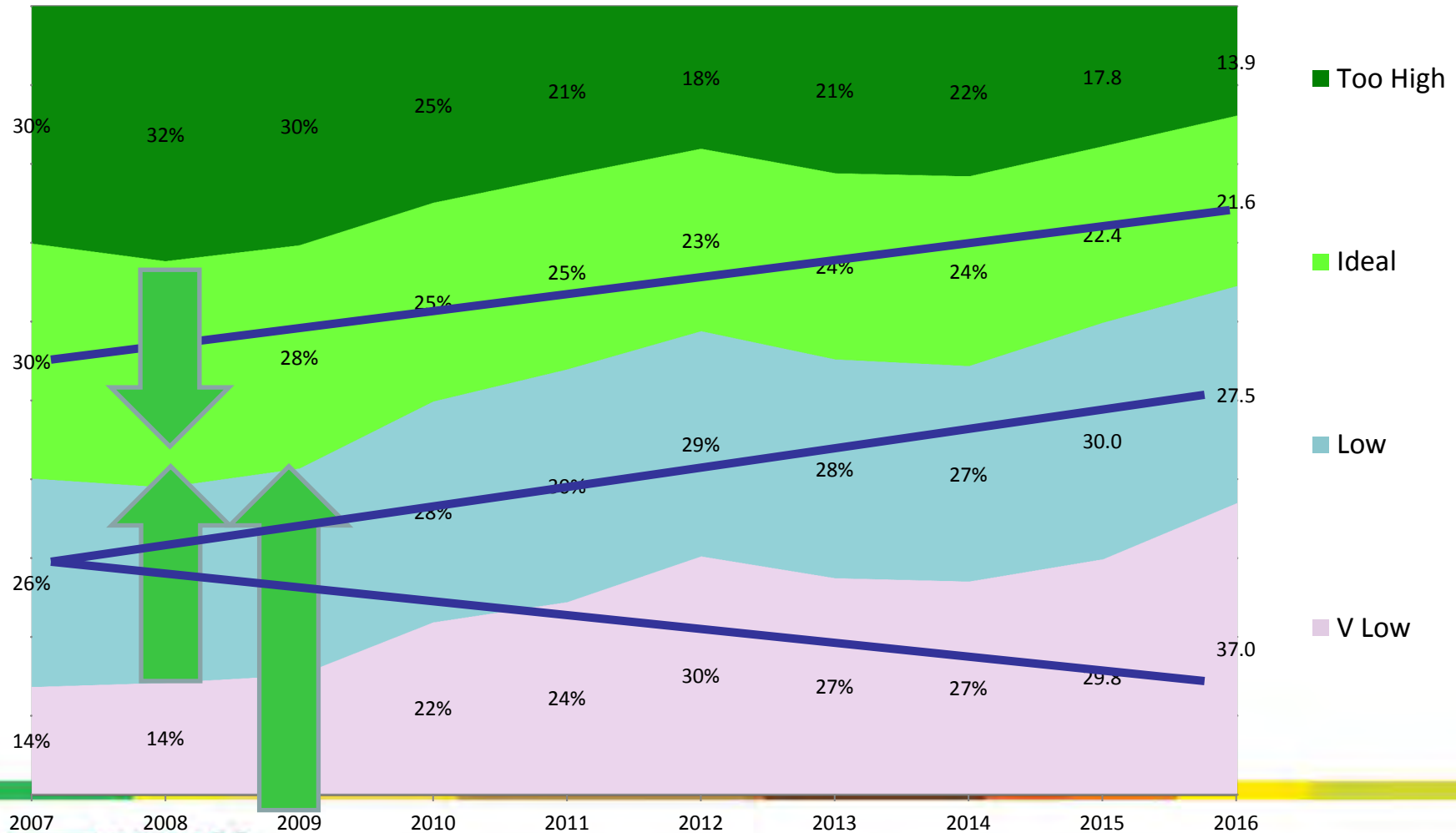
Emissions Reduction

NMP Online

- Application of OM
 - Low emissions application
 - Timing
 - Targeting plots
- Shifting farmers product to protected urea
- Improved soil fertility leading to optimum N efficiency

Soil Fertility

What has happened to Soil Phosphorus Levels since 2007 Soil Test Results



Quality of Planning

The Challenge

- Meet Regulatory needs
- To be scalable dependent on requirement
- To be efficient for the planner
- To be understood and implementable by the farmer
- Open to all users
- Emerging Challenges
 - Competition
 - CAP Regulation – Plan for All Farms
 - Focus on GHG and Ammonia

Efficiency of Advisers

The problems for Advisers

- Huge Workload in preparing plans
- Focus on compliance first
- Little time to focus on agronomic competency
- Quality of Planning Systems & Plans
 - Farmers did not understand them
& did not use them
or could not use them

Delivering Change

Farm & Soil fertility Summary

Fertiliser Plan Summary		Mr NMP Farmer 2017		
Herd No.	G1234567	Land Areas	Ha	%
Address	Tullycagney, Drumanab, Castleblayney, Longford	Total	67.58	28.8
County (Zone)		Grassland	19.49	28.8
Weeks Storage	18 Weeks	Arable	48.09	71.2
		Sampled Areas	67.58	100.00

Close

Soil Fertility Summary

Overall Fertility Status

pH > 6.2, P & K index 3 or 4

Lime

Soil pH > 6.2

Phosphorus

P Index

Potassium

K Index

Chemical Fertiliser Advice

Nutrient Balance

	N(kg)	P(kg)	K(kg)
Chemical Recommended	11,218	2,505 (98%)	5,158
Max Chemical Allowed	11,651	2,564	
Chemical Usage	10,980	2,139	4,445

Planned Fertilisers

Fertiliser	Tonnes
CAN(27%N)	13.47
Urea(46%N)	3.11
14-7-14	13.07
10-7-25	0.62
24-7.5-0	1.62
18-6-12	17.66
20-0-15	2.28

Index 1

Yes
No

%re
pH,
26

%reduc
pH, P an
26

Soil pH

Lime

2017

2018

2019

2020

Organic

Chemical

Nutrient

Chemical

Max Ch

Chemical Usage

9,477

1,653

3,252

14-7-14

10-7-25

12.35

0.00

This report is based on information inputted into Teagasc NMP online.
Teagasc cannot accept responsibility for inaccurate information being inputted

Teagasc NMP online
2/13

Agent: Pat Murphy
Date Printed: 01/09/2017

Lime Requirements

Plot Name	Crop	Area (Ha)	Soil Sample Id	Soil Sample pH	Soil Sample Lime Req (T/Ha)	Advised Lime			
						2017 (T/Ha)	2018 (T/Ha)	2019 (T/Ha)	2020 (T/Ha)
1	Winter Wheat (Feed)	5.1	NAL483	6.3	0.0	0.0	0.0	3.0	0.0
10	Grazing	2.5	zzz486	5.7	4.0	4.0	0.0	0.0	0.0
11	Spring Barley (Malting)	5.9	zzz487	6.3	0.0	0.0	0.0	0.0	0.0
12	1 Out + Grazing	6.7	zzz488	5.6	3.5	4.0	0.0	0.0	0.0
13	Winter Barley, Catch Crop Grazed Sown Pre Aug 15(Incl GLAS)	5.2	zzz489	5.7	4.0	4.0	0.0	0.0	0.0
14	Winter Wheat (Feed)	5.0	zzz490	6.4	0.5	0.0	0.0	2.0	0.0
15	GLAS LFP	3.6	NAL490	6.2	0.5	0.0	0.0	2.0	0.0
2	Winter Barley	2.5	GAF 2	5.8	6.0	4.0	0.0	4.0	0.0
3	Grazing	1.9	GAF 3	7.1	0.0	0.0	0.0	0.0	0.0
4	Winter Wheat (Feed)	3.3	GAF 4	6.1	4.0	0.0	0.0	2.0	0.0
5	Winter Oilseed Rape	3.2	GAF 5	6.3	2.0	0.0	0.0	2.0	0.0
6	Winter Barley	5.9	NAL484	6.1	1.5	2.0	0.0	0.0	0.0
7	Winter Wheat (Feed)	6.8	NAL485	5.4	6.0	5.0	0.0	0.0	0.0

Manure Allocations			
Fertiliser	Estimated T	Applied T	Balance T
Cattle Slurry	194	195	0
Farmyard Manure	207	227	0
Total P in Manures			241

Planned Fertilisers	
Fertiliser	Tonnes
CAN(27%N)	13.47
Urea(46%N)	3.11
14-7-14	13.07
10-7-25	0.62
24-7.5-0	1.62
18-6-12	17.66
20-0-15	2.28

Nutrient Balance			
	N(kg)	P(kg)	K(kg)
Chemical Recommended	11,218	2,505 (98%)	5,158
Max Chemical Allowed	11,651	2,564	
Chemical Usage	10,980	2,139	4,445

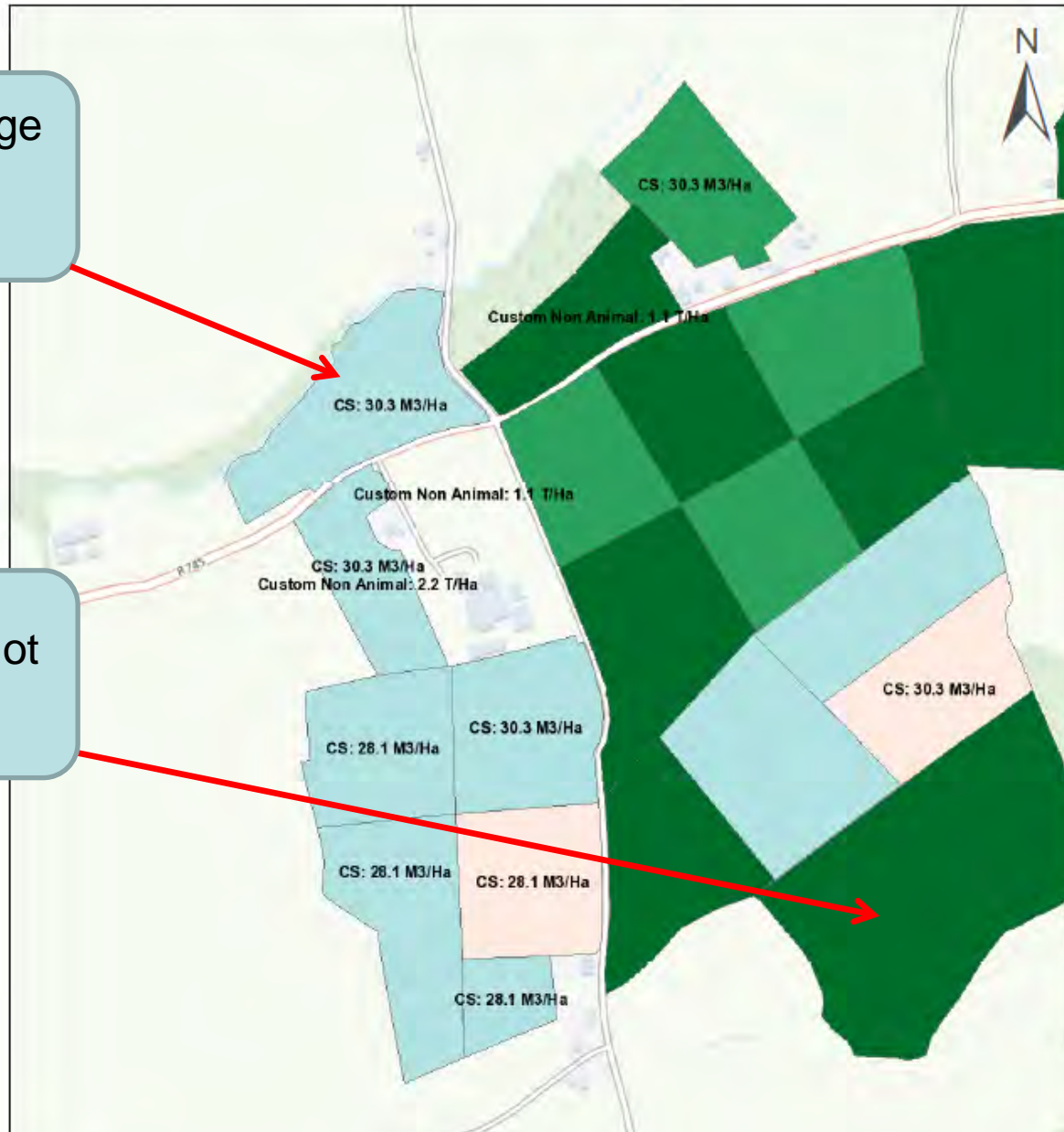
Plot	Crop	Area(Ha)	Soil Sample	Index	Nutrients Applied (Kg/Ha)	Organic Manures		Chemical Fertilisers							
						N P K	Farmyard Manure (T/Ha)	Cattle Slurry (M3/Ha)	CAN(27%N) (Bags/Acre)	Urea(46%N) (Bags/Acre)	14-7-14 (Bags/Acre)	10-7-25 (Bags/Acre)	24-7.5-0 (Bags/Acre)	18-6-12 (Bags/Acre)	20-0-15 (Bags/Acre)
1	Winter Wheat (Feed)	5.1	NAL483	1 2 2	209 37 96		10.0	0.0	4.0	0.0	4.0	0.0	0.0	0.0	0.0
2	Winter Barley	2.5	GAF 2	3 3 2	109 26 79		0.0	0.0	2.0	0.0	1.0	2.0	0.0	0.0	0.0
3	Grazing	1.9	GAF 3	1 4 3	208 0 28		0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	1.5
4	Winter Wheat (Feed)	3.3	GAF 4	1 3 4	252 37 0		0.0	0.0	4.0	0.0	0.0	0.0	4.0	0.0	0.0
5	Winter Oilseed Rape	3.2	GAF 5	1 3 2	222 19 37		0.0	0.0	5.0	0.0	0.0	0.0	0.0	2.5	0.0
6	Winter Barley	5.9	NAL484	1 1 1	175 37 96		10.0	0.0	3.0	0.0	4.0	0.0	0.0	0.0	0.0
7	Winter Wheat (Feed)	6.8	NAL485	3 1 2	143 46 113		10.0	0.0	1.5	0.0	5.0	0.0	0.0	0.0	0.0
8	Grazing	1.9	NAL486	1 2 2	207 19 73		0.0	10.0	0.0	2.5	0.0	0.0	0.0	2.0	0.0
9	Spring Barley (Malting)	5.3	YBD639-(3)	3 2 3	89 30 59		0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0
10	Grazing	2.5	zzz486	1 2 2	202 17 51		0.0	5.0	1.0	2.0	0.0	0.0	0.0	2.0	0.0
11	Spring Barley (Malting)	5.9	zzz487	1 1 1	156 52 104		0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	0.0
12	1 Out + Grazing	6.7	zzz488	1 1 1	208 45 160		0.0	20.0	0.0	1.0	0.0	0.0	0.0	5.0	0.0
13	Winter Barley	5.2	zzz489	3 1 1	126 26 107		0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0

Joe Bloggs - P Value and Organic Manures

Simple Message

- Where
- How Much

Avoid where Not required



Research/Data

Research

- Soil Fertility Trends
- Requirement to use the data to improve outcomes
- Increase use of GIS data
- Variable recommendations based on soil type
- Possibilities to investigate and increase knowledge on micro-nutrient status
- Linkages to other systems - Pasturebase
- GDPR Challenge

At Farm Level

- John Leahy, Athea, Co. Limerick
- Increase mineral soil pH from 5.5 to 6.3 over a period of 3 years
- 100t lime per year on 40ha costing €2,600/yr
- Increased average grass production by 1.5t DM/ha/yr (valued at €272/ha)
- Average lime applied per year 7.5t/ha (Costing €65/ha/year)
- ROI of €4 of grass extra for every €1 in lime

