



# Fertiliser Use in Ireland 2005 - 2015

Teagasc National Farm Survey

Emma Dillon & Brian Moran

*Teagasc, Rural Economy & Development Programme, Athenry*

# Outline

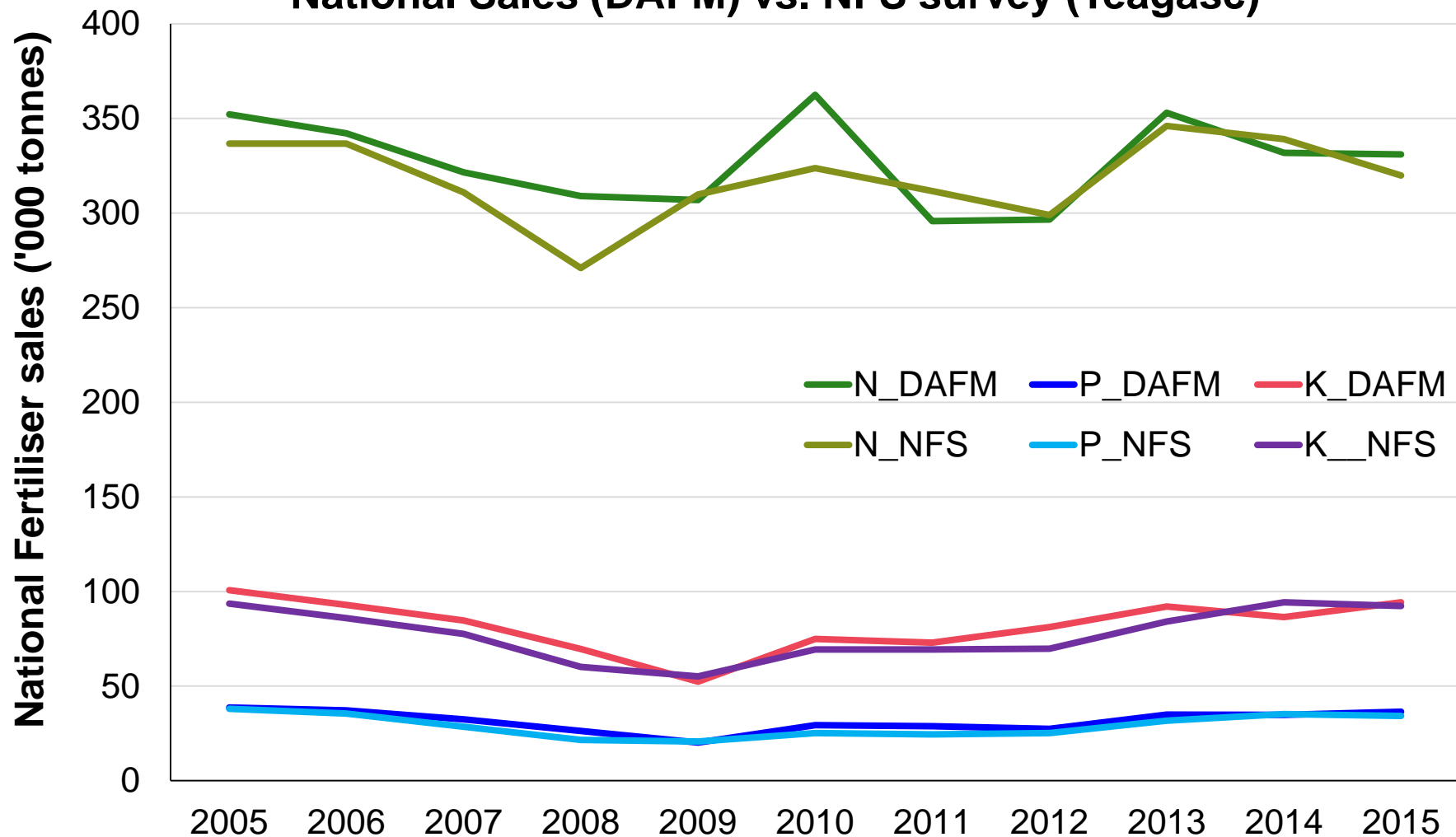
- Introduction
- Teagasc National Farm Survey
- Presentation of Results
- Demand Drivers 2005-2015
- Results Overview
- Conclusions/Recommendations

# Fertiliser Use Data in the NFS

- Types and quantities of chemical fertiliser used on-farm.
  - Grassland – Grazing, Silage, Hay
  - Crops – cereals, roots
- Information on livestock numbers, farm system and land use class.
- Possible to examine the relationship between N, P and K usage and factors such as geographic region, farm size, system, stocking rate and soil use class.
- Environmental Scheme Participation.

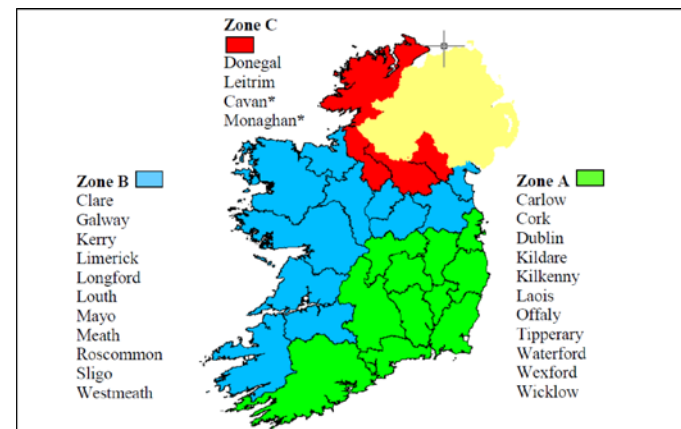
# Validation of Results

**N, P and K Fertilisers 2005 -2015**  
**National Sales (DAFM) vs. NFS survey (Teagasc)**



# Presentation of Results

- Nitrates Directive Fertiliser Management Zones
- Land Use Class
- Farm System
- Grassland
- Crops
- Agri-Environment Schemes



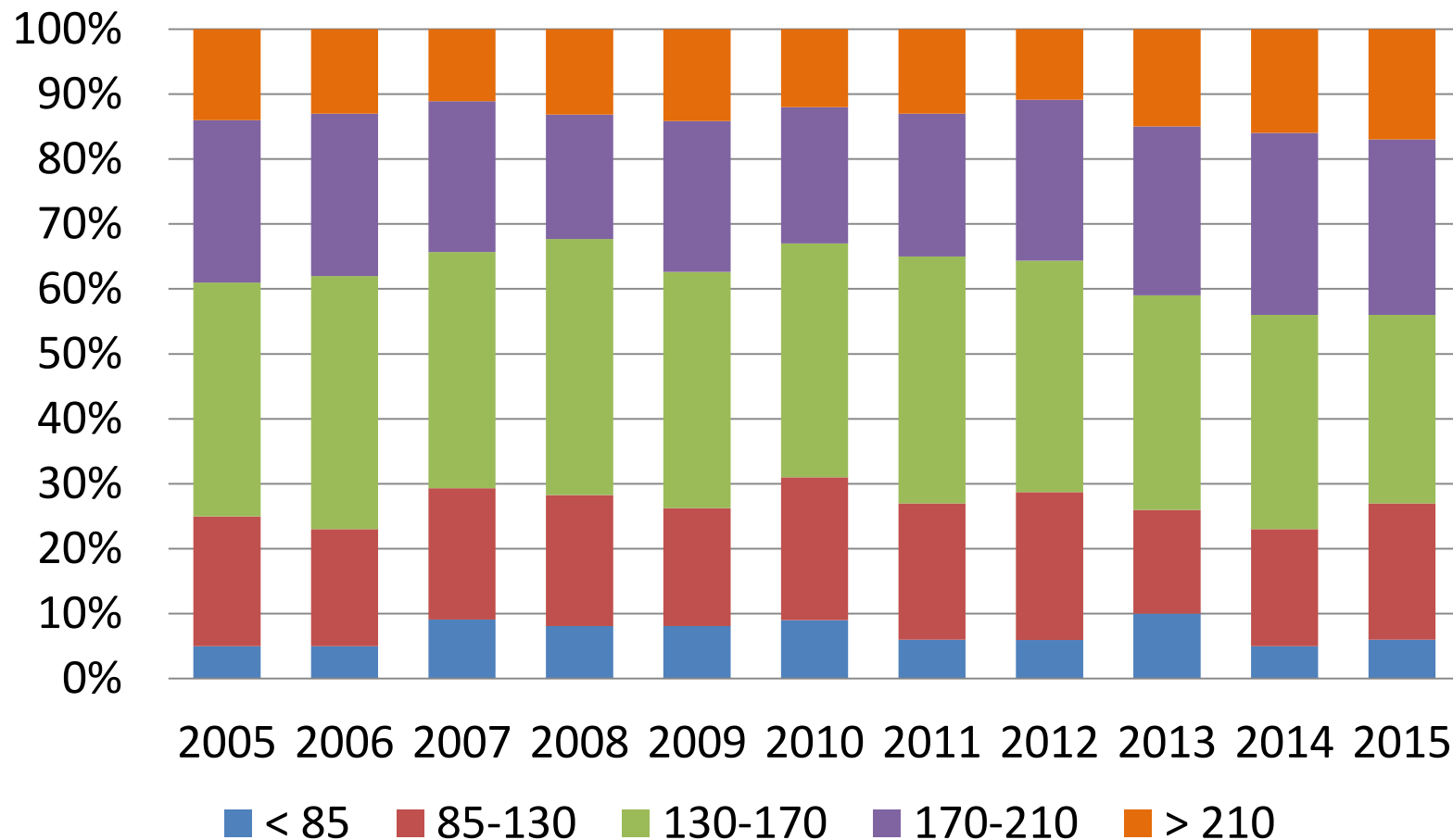
# Factors driving fertiliser use

- Farming Intensity
  - Farming enterprise and system
  - Stocking-rate intensity
- Fertiliser Price
- Farm Gate Prices
- Weather
- Nutrient Advice
- Environment Regulation
- Land Use Class (soil type)
- Other (e.g. schemes, incentives etc.)



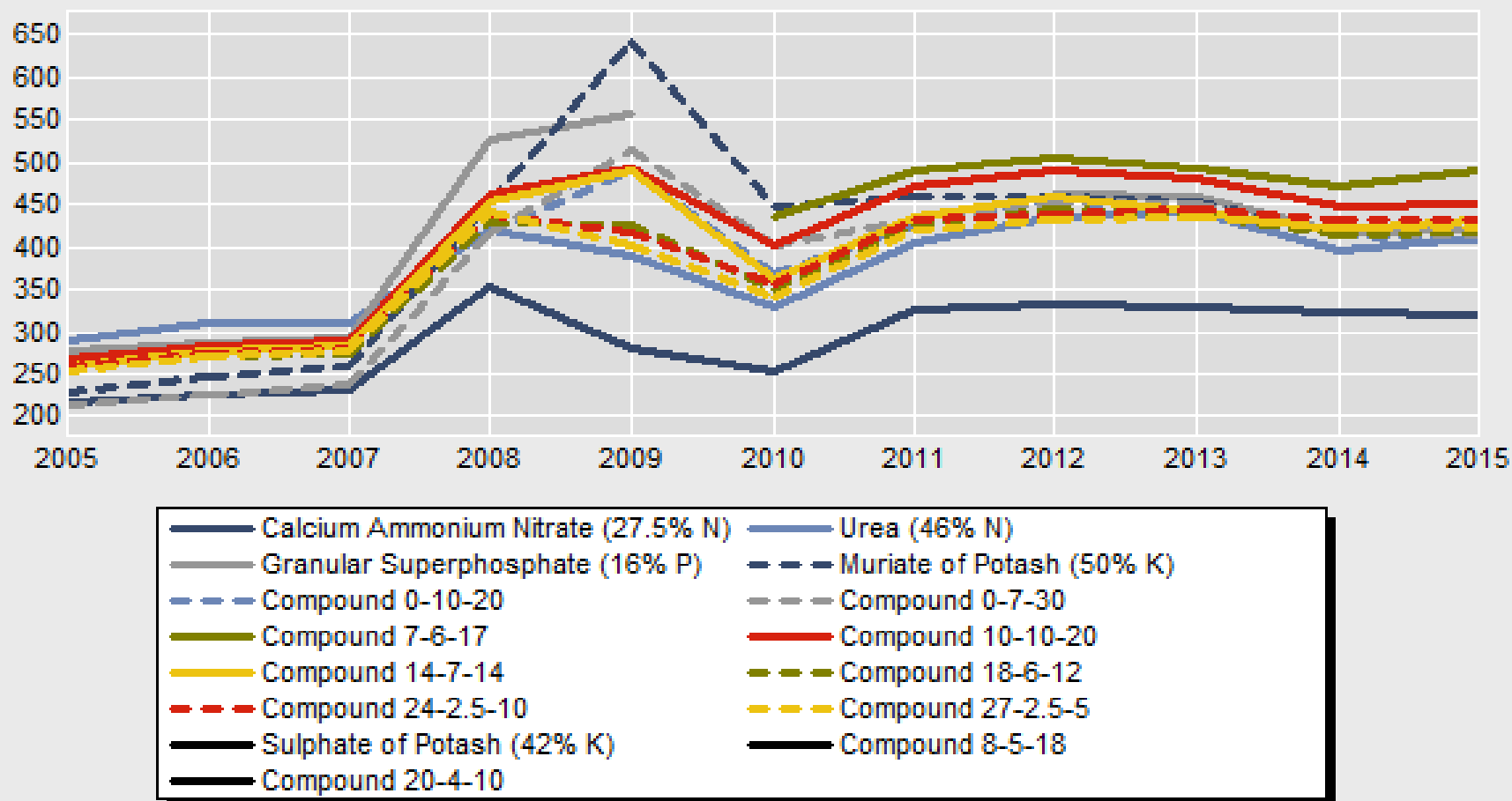
# Farming Intensity: e.g. Dairy

Dairy population distribution by stocking rate band (kg/ha Org.N) (2005-2015)



# Fertiliser Price

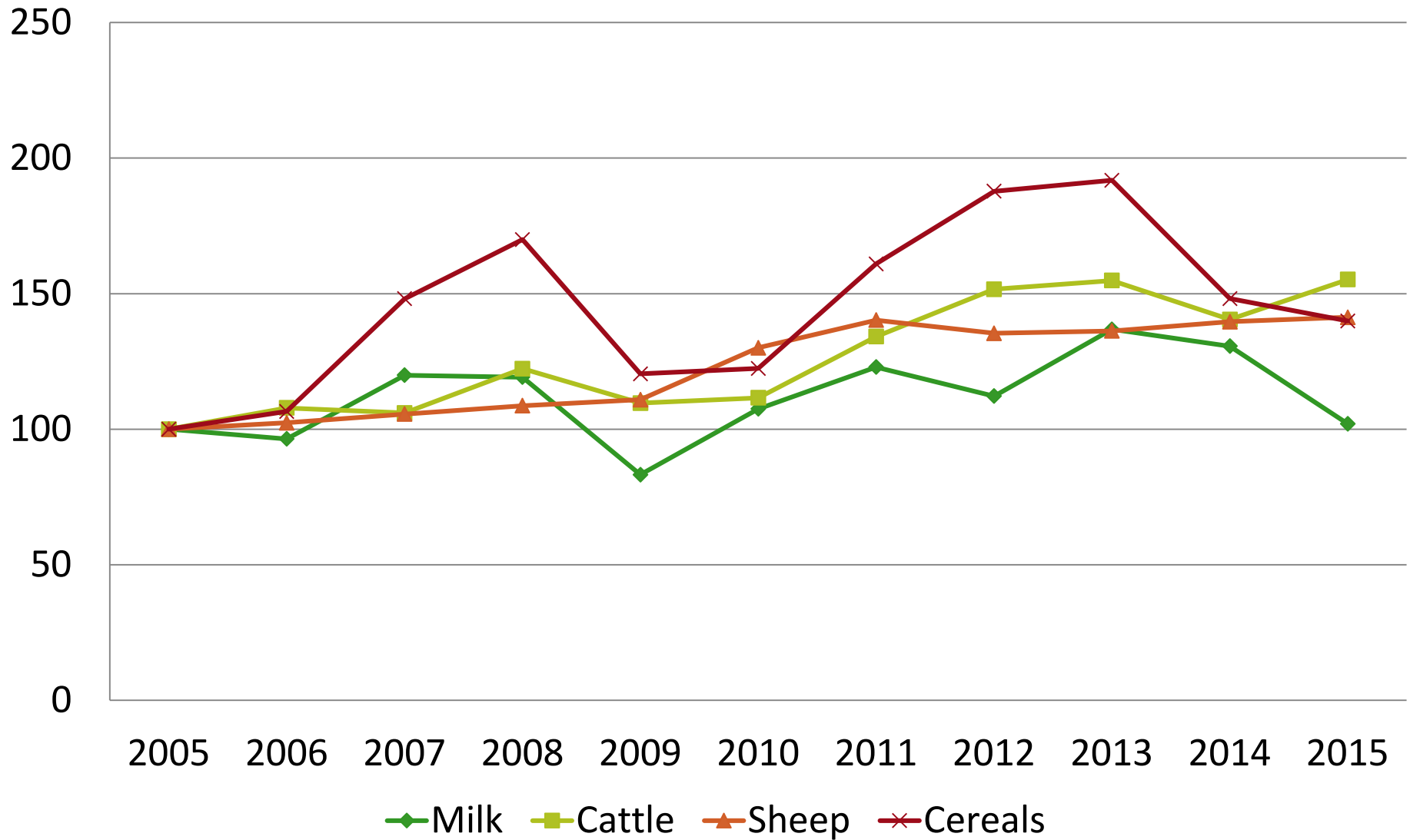
Fertiliser Price (Euro per Tonne)  
by Type of Fertiliser and Year  
(Euro per Tonne)



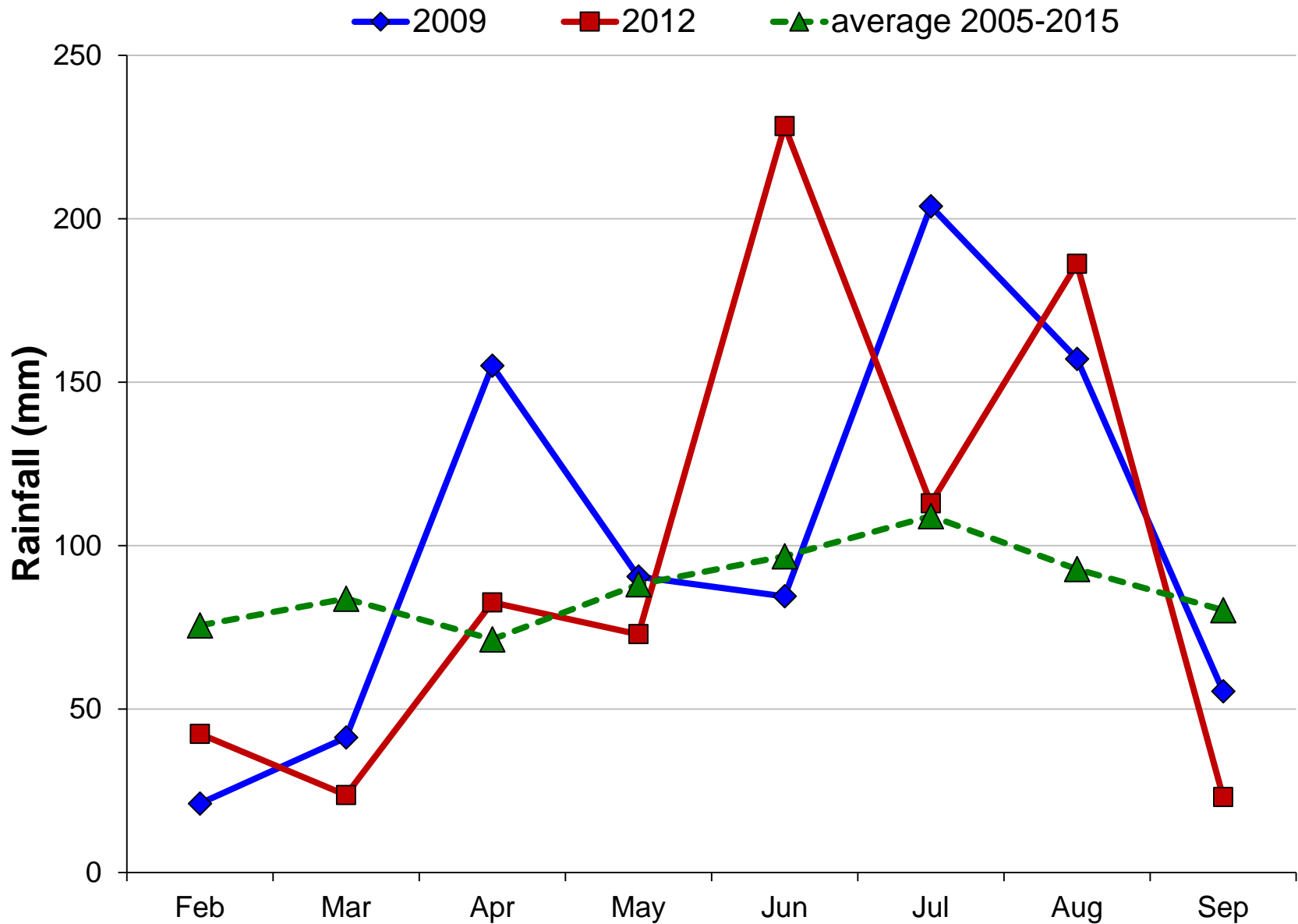
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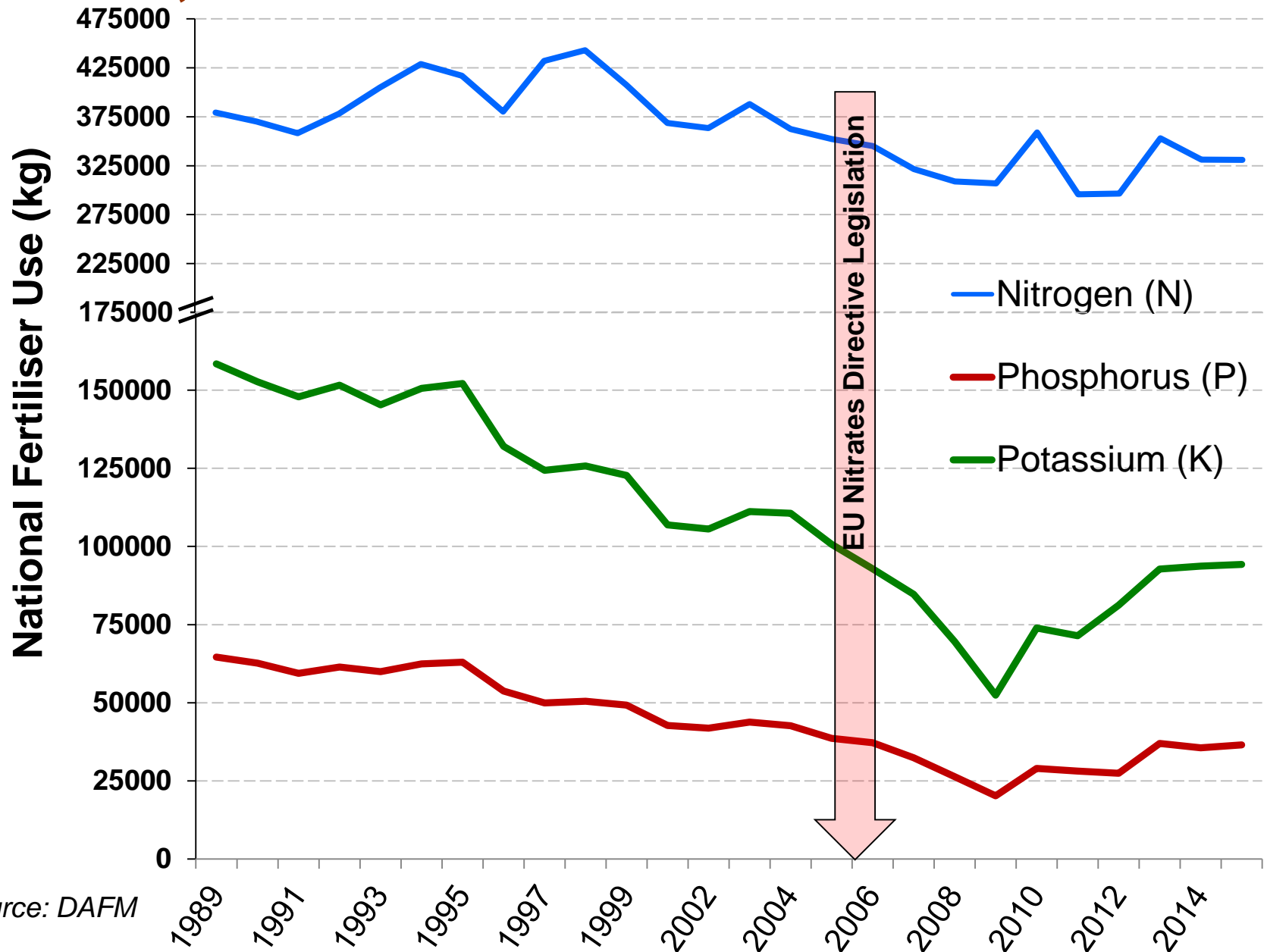
# Agricultural Output Price Indices (Base 2005 = 100)



# Weather (Rainfall)



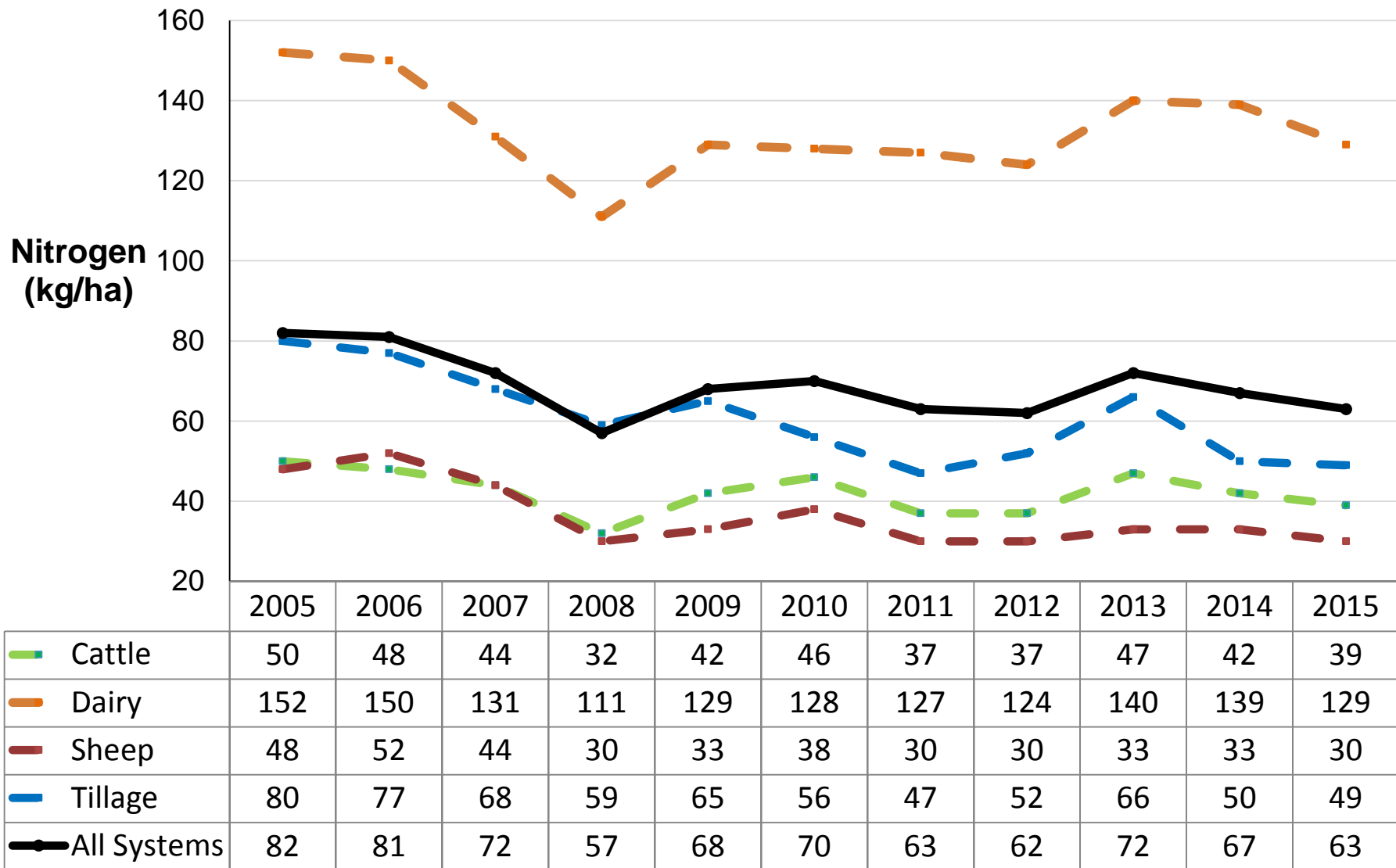
# N, P & K Fertiliser use 1990 - 2015



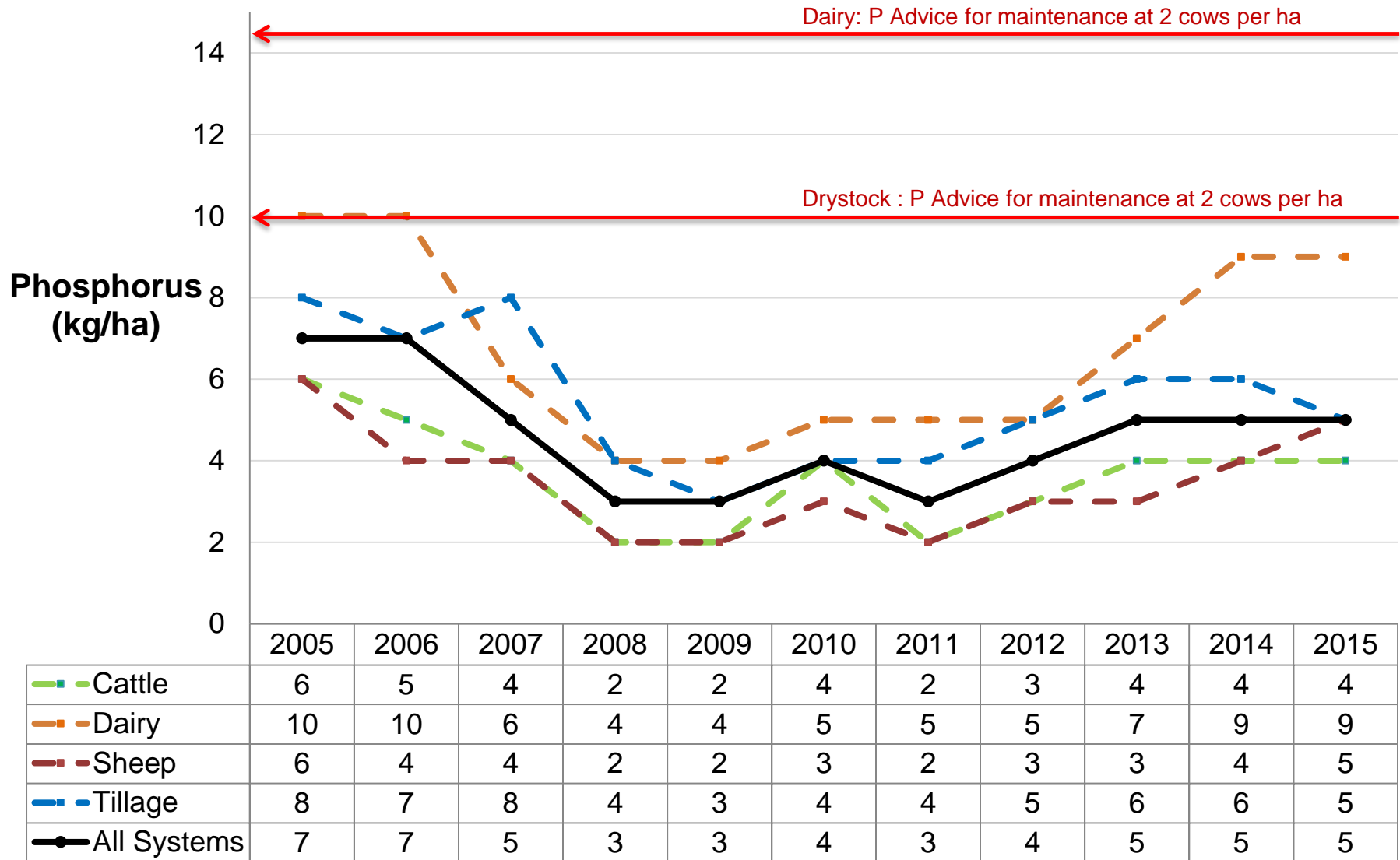
Source: DAFM

# Fertiliser Use: Grassland - Grazing

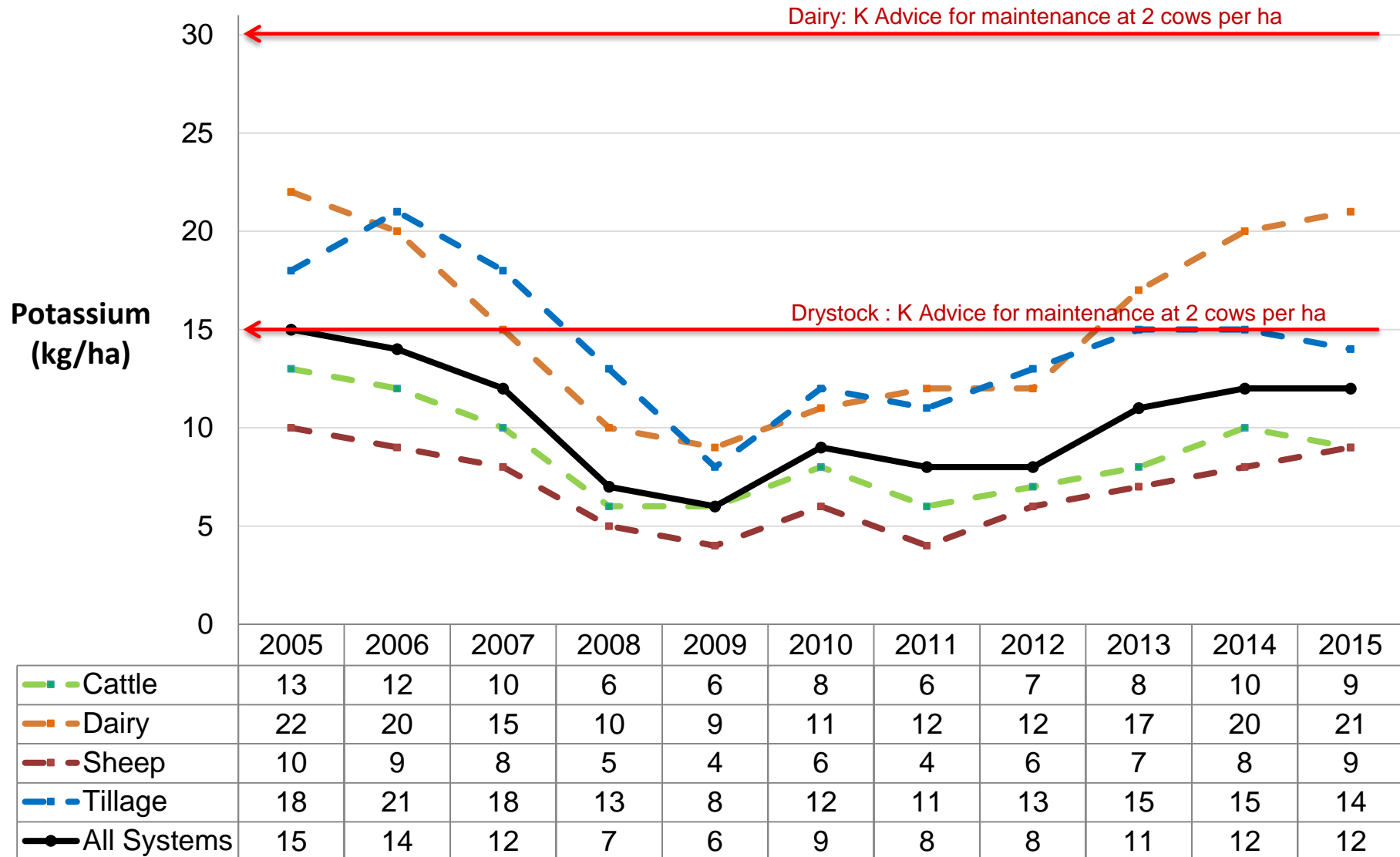
# Grassland: N for grazing by Farm System



# Grassland: P for grazing by Farm System



# Grassland: K for grazing by Farm System



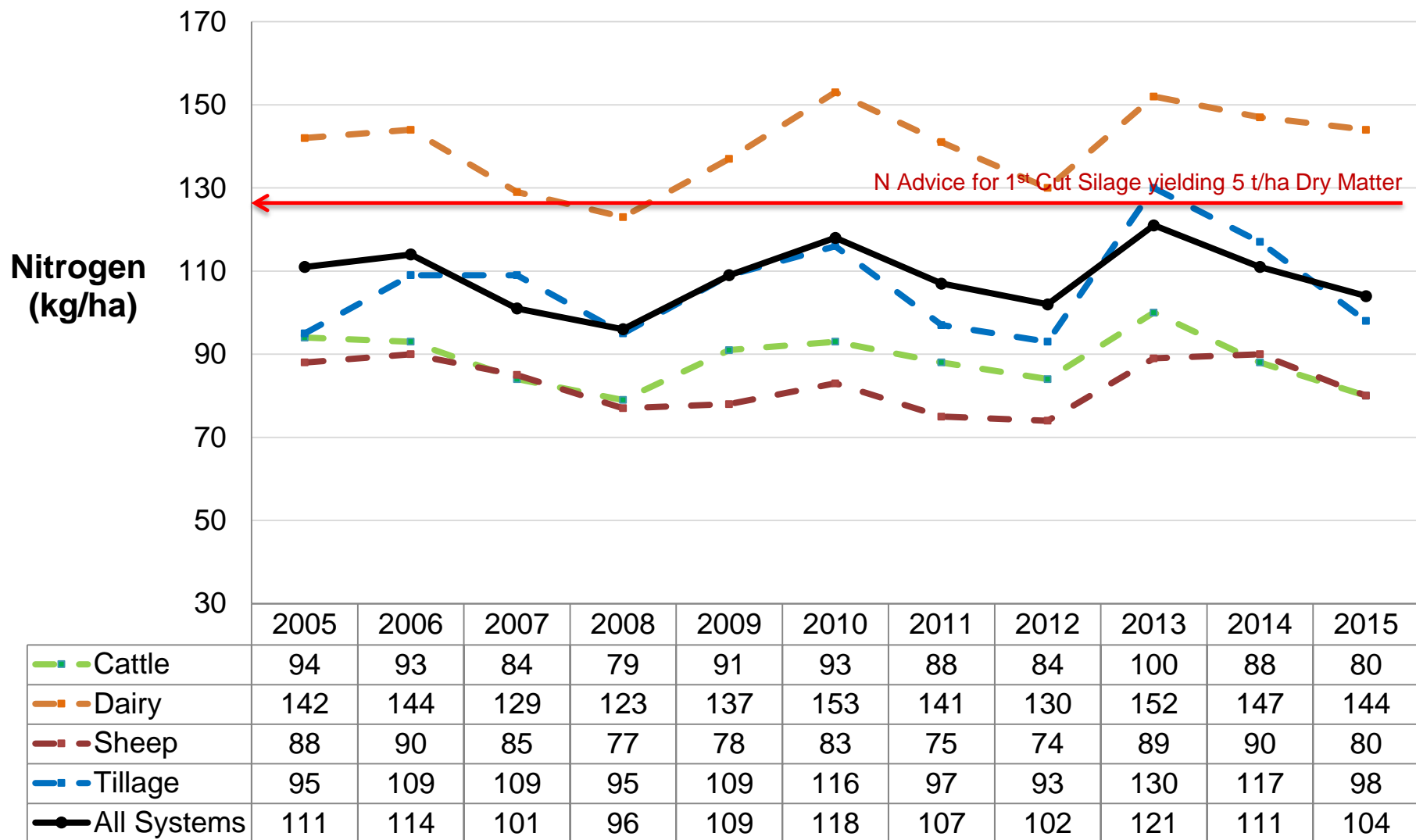
# Grassland: N, P, K for grazing by Farm System

Year	Stocking Rate (kg/ha Org N)	Farms No.	Pop. No.	Pop. %	N (kg/ha)	P (kg/ha)	K (kg/ha)	Area
2005	< 85	17	923	5%	44	4	8	42
2005	85-130	74	4022	20%	90	8	18	34
2005	130-170	165	7087	36%	135	9	20	42
2005	170-210	124	5079	25%	192	11	24	39
2005	> 210	67	2847	14%	260	17	35	30
2010	< 85	18	1811	9%	39	2	5	30
2010	85-130	66	4306	22%	82	4	10	39
2010	130-170	130	7107	36%	127	5	12	41
2010	170-210	83	4244	21%	163	5	13	38
2010	> 210	49	2489	12%	205	5	5	39
2015	< 85	10	1073	6%	29	2	4	48
2015	85-130	55	3887	21%	73	6	13	39
2015	130-170	115	5443	29%	130	9	21	44
2015	170-210	104	4942	27%	164	10	27	43
2015	> 210	63	3216	17%	188	10	25	33

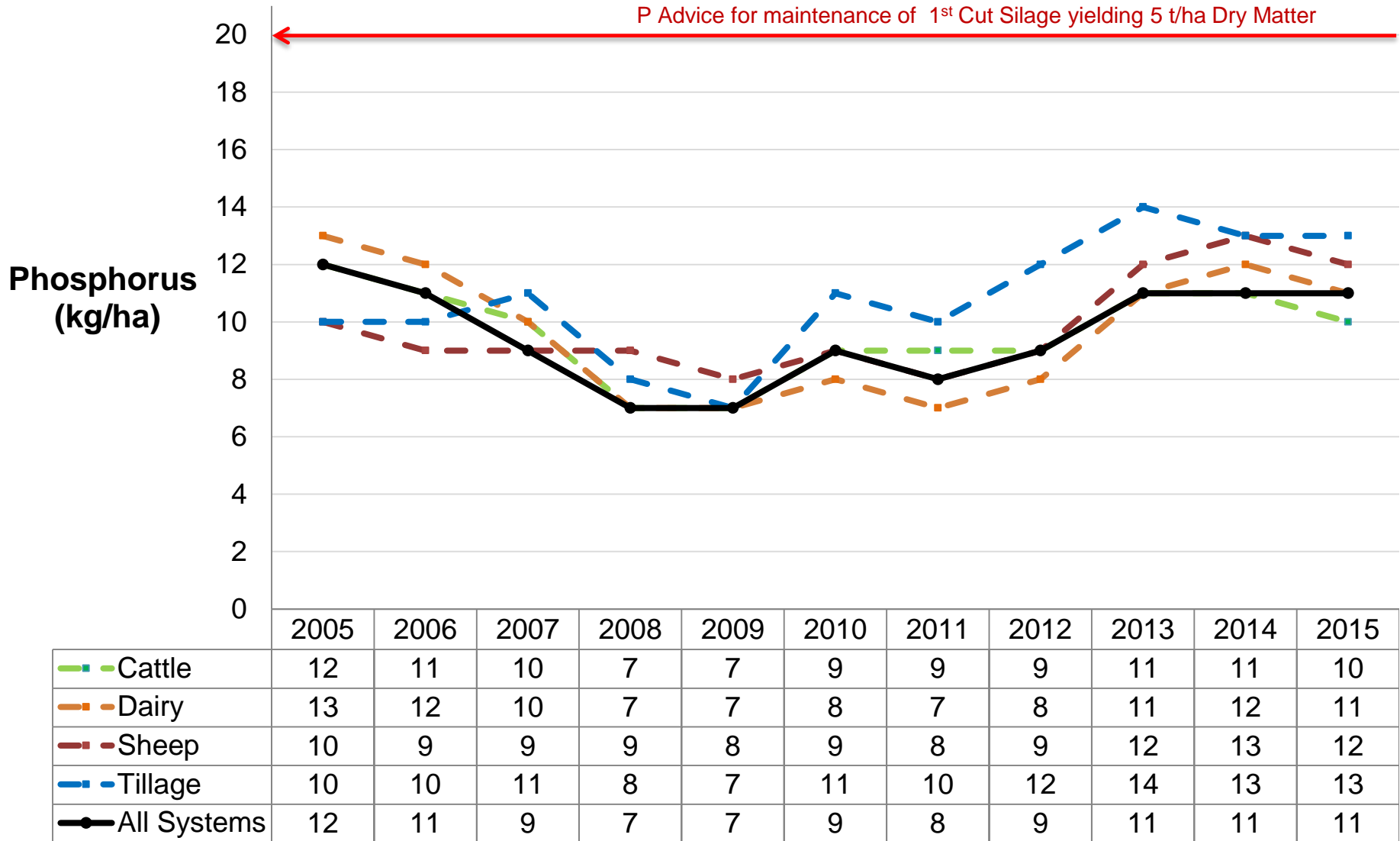


# Fertiliser Use: Grassland - Silage

# Grassland: N for Silage by Farm System

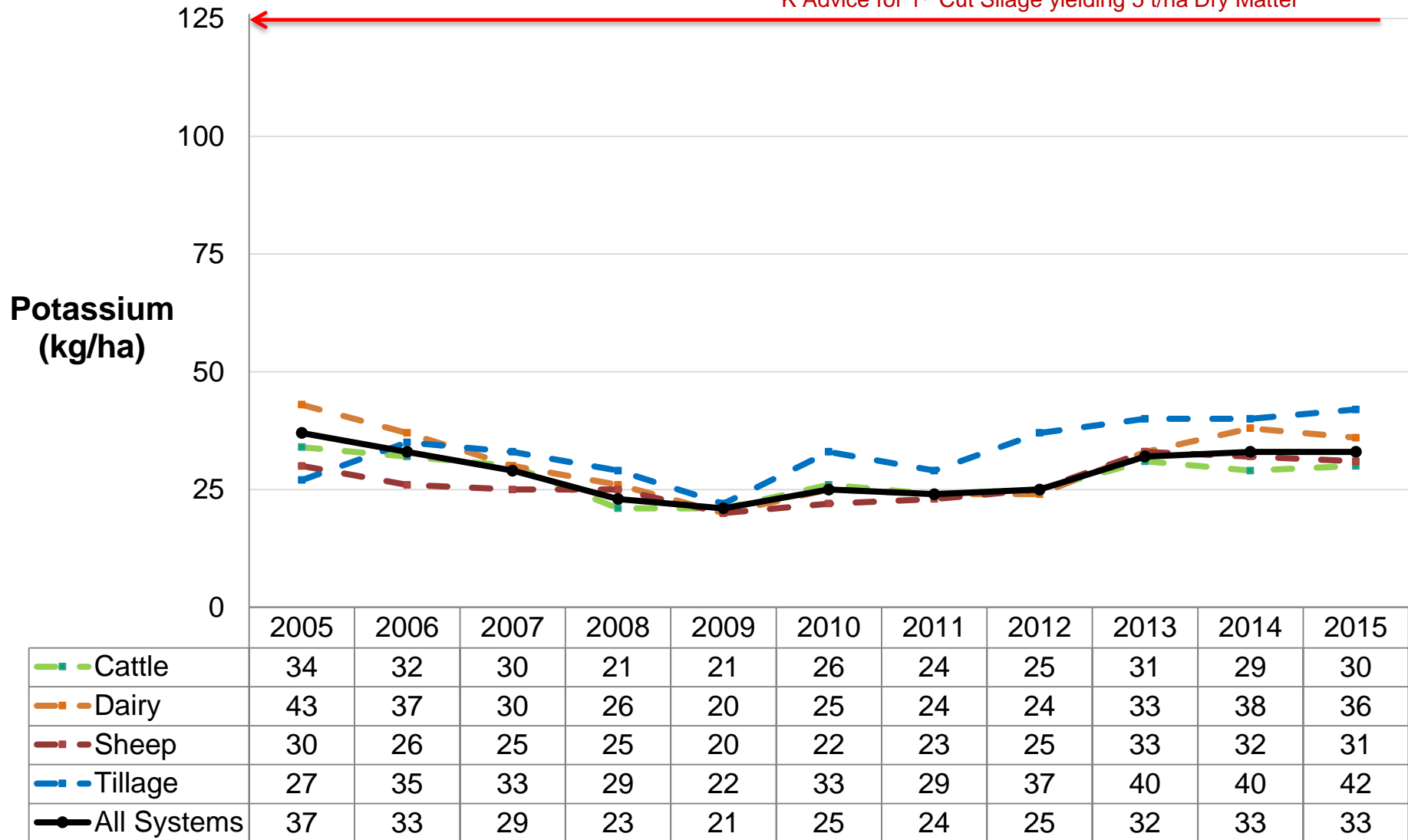


# Grassland: P for Silage by Farm System



# Grassland: K for Silage by Farm System

K Advice for 1<sup>st</sup> Cut Silage yielding 5 t/ha Dry Matter



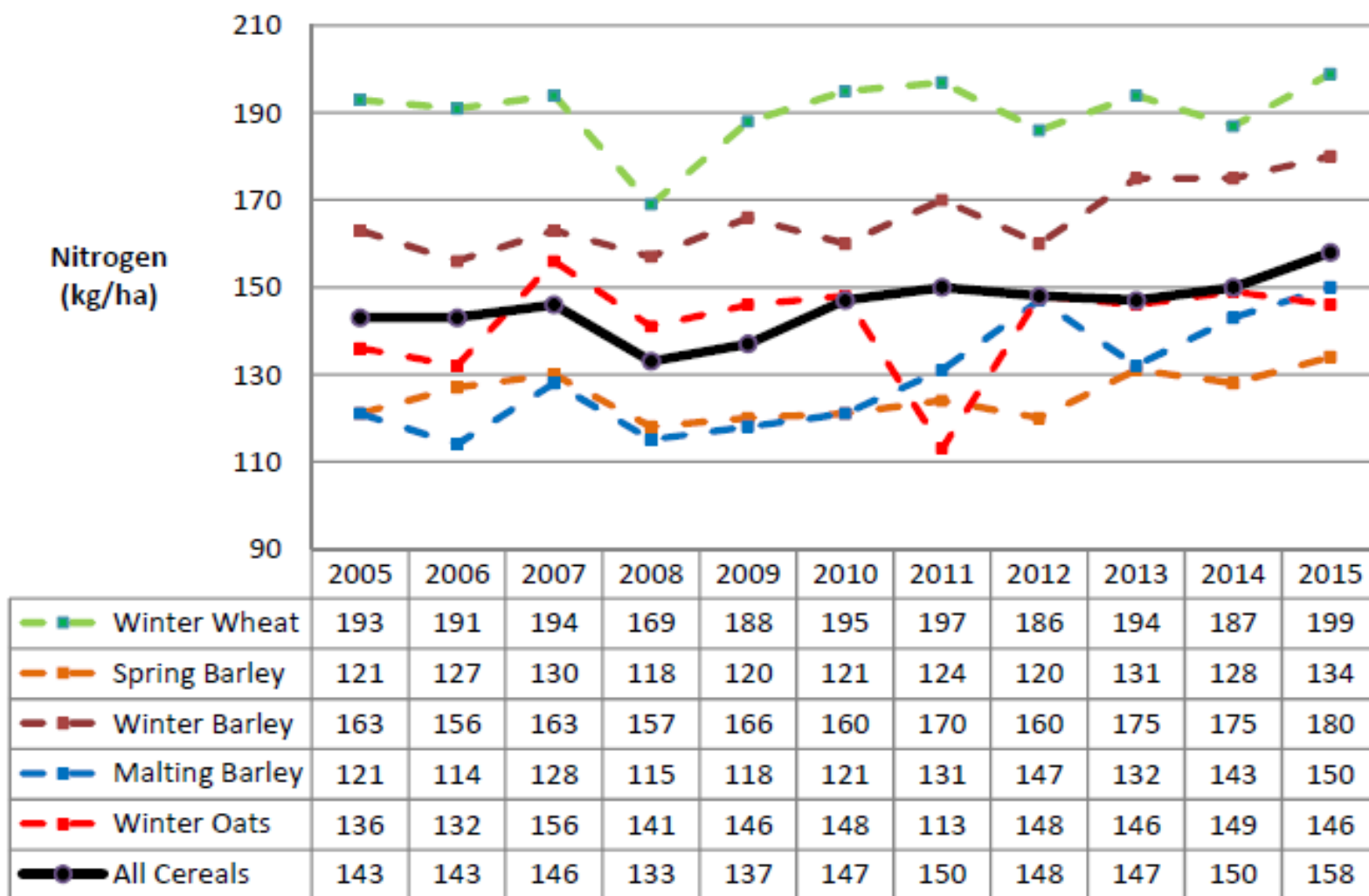
# Grassland: top 20 Fertilisers by Quantity

fert - type	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CAN 27 - 0 - 0	28.2	32.2	35.2	40.7	49.3	45.6	45	41.8	39.1	34	32.4
27 - 2.5 - 5	26	24.7	22.8	18.9	14.7	12.6	12.7	16	15	14.1	14.2
24 - 2.5 - 10	15.7	14.2	13.7	12.8	9.5	11	10.9	11.5	13.2	11.8	13
18 - 6 - 12	7.8	8	7.6	6	5.3	6.5	5.5	5.9	8.1	11	11.5
Urea 46 - 0 - 0	7.5	7.2	6.7	10	10.2	9.3	9.7	7.9	6	6.6	6.6
10 - 10 - 20	2.1	1.8	1.1	0.7	0.7	1.5	1.9	1.4	1.8	3.1	3
N 23 - 0 - 0	0.6	0.7	0.6	1	0.6	0.8	1.7	1.8	2	1.8	2.4
23 - 2.5 - 5	1.5	1.7	1.3	0.8	0.6	1.3	1.6	2.3	2	1.6	2.2
24 - 2.2 - 4.5	0.3	0.6	0.6	0.3	1.2	2.3	2.8	2.4	2.7	2.2	1.5
19 - 0 - 15	0.1	0.3	1.6	1.3	0.7	0.9	0.9	0.7	0.8	1.5	1.2
0 - 7 - 30	1.5	1.3	0.7	0.6	0.3	0.6	0.7	0.6	0.5	0.9	0.8
26 - 0 - 0	-	0.1	0.2	0.2	0.4	0.4	0.4	0.7	1	0.9	0.6
MOP 0 - 0 - 50	0.1	0.2	0.2	0.3	0.1	0.1	0.3	0.3	0.4	0.4	0.5
20 - 2 - 12	-	-	-	-	-	-	-	-	0.1	0.1	0.5
20 - 4 - 10	0.6	0.6	0.6	0.3	0.1	0.2	0.2	0.2	0.1	0.3	0.5
24 - 2 - 5	-	-	-	0.1	-	-	0.1	0.8	0.3	1.3	0.5
21 - 0 - 0	0.1	-	-	-	0.1	0.2	0.3	0.1	-	0.5	0.4
23 - 2.5 - 10	0.2	0.1	0.1	0.2	0.1	0.1	0.1	-	0.2	0.3	0.4
Other	7.7	6.3	6.9	5.8	6.1	6.6	5.2	5.6	6.7	7.6	7.8
Total	100	100	100	100	100	100	100	100	100	100	100

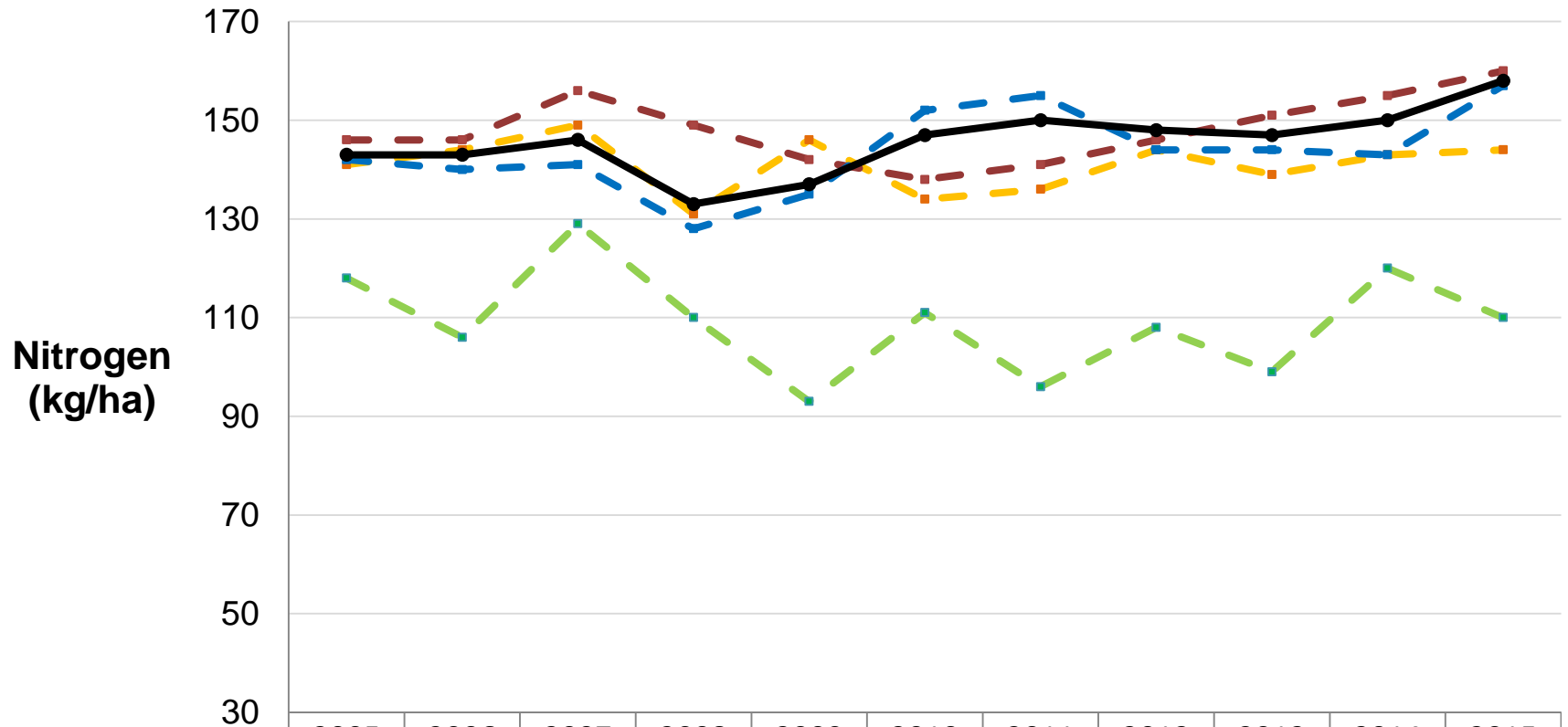
# Fertiliser Use: Crops

# Results

Figure 52: N use on individual cereal crops



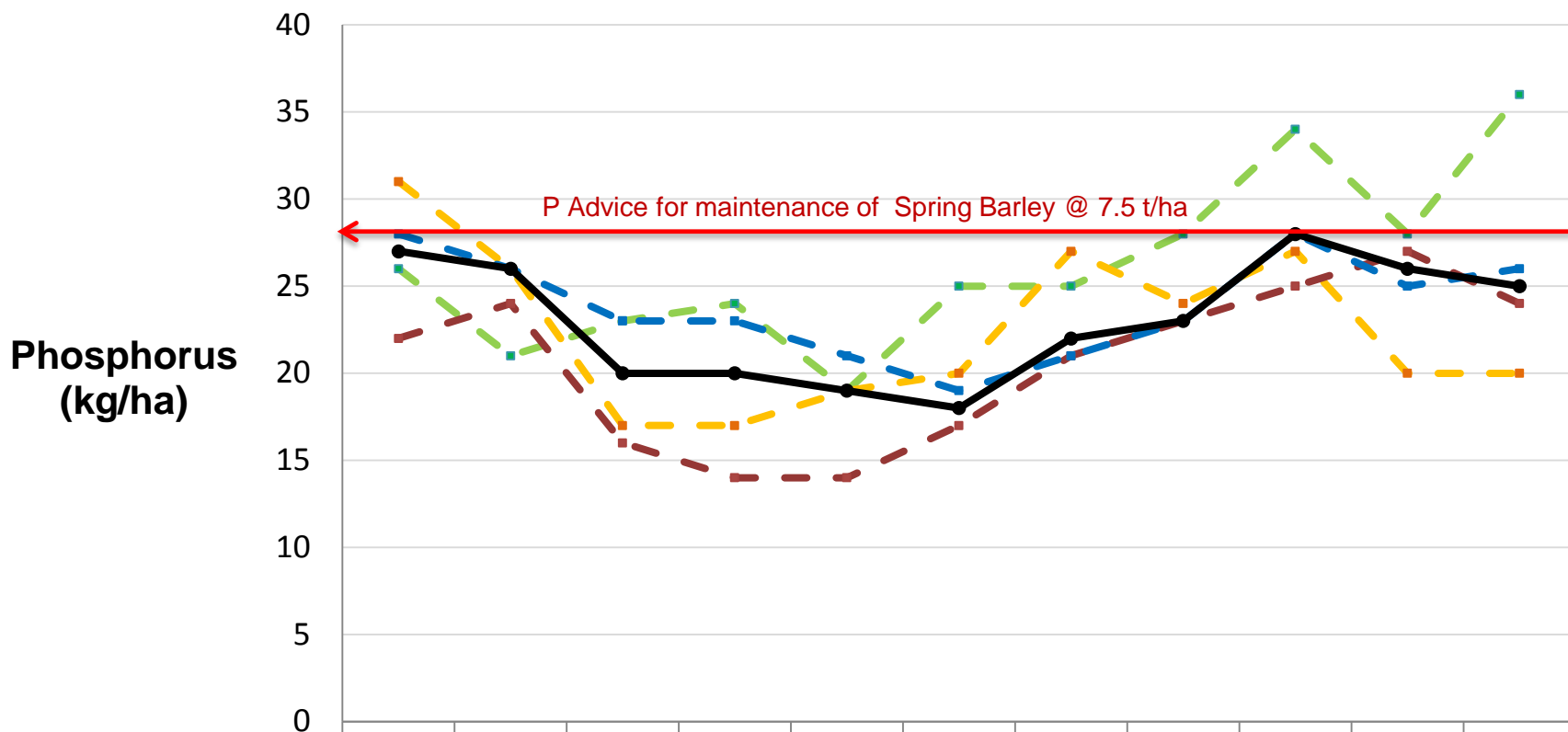
# Crops: N on cereals by Land-use Class



—■— Limited	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
—■— Somewhat Limited	118	106	129	110	93	111	96	108	99	120	110
—■— Moderately Limited	141	144	149	131	146	134	136	144	139	143	144
—■— Wide	146	146	156	149	142	138	141	146	151	155	160
—●— All Soils	142	140	141	128	135	152	155	144	144	143	157
	143	143	146	133	137	147	150	148	147	150	158

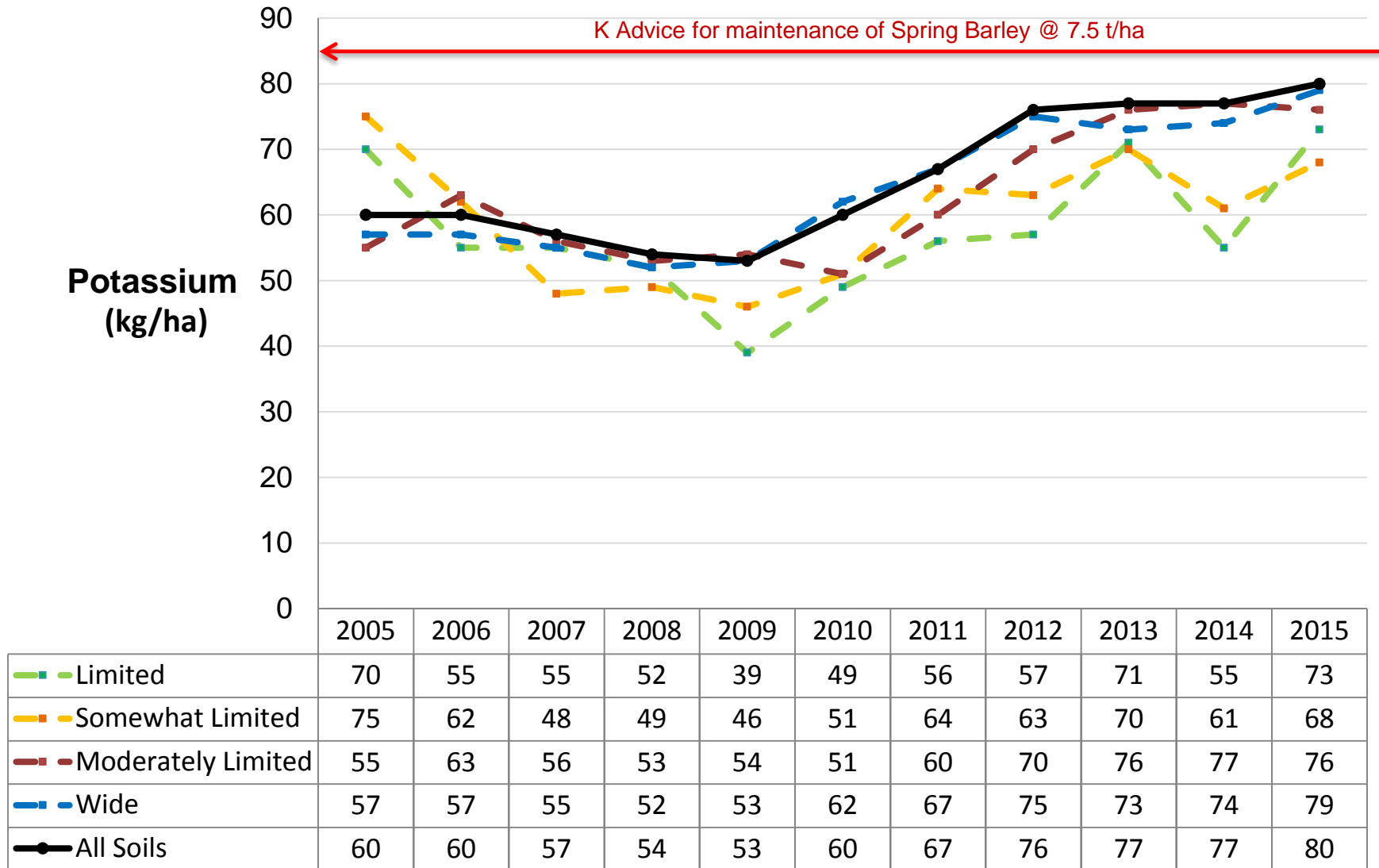


# Crops: P on cereals by Land-use Class



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
— Limited	26	21	23	24	19	25	25	28	34	28	36
— Somewhat Limited	31	26	17	17	19	20	27	24	27	20	20
— Moderately Limited	22	24	16	14	14	17	21	23	25	27	24
— Wide	28	26	23	23	21	19	21	23	28	25	26
— All Soils	27	26	20	20	19	18	22	23	28	26	25

# Crops: K on cereals by Land-use Class



# Crops: P use by Crop Type

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Winter Wheat	28	29	20	19	18	14	19	17	31	19	25
Spring Barley	25	25	22	21	21	20	24	26	27	28	25
Spring Wheat	28	25	18	16	15	17	21	22	19	15	19
Winter Barley	32	37	22	24	11	20	21	30	31	29	26
Malting Barley	20	19	18	16	14	20	20	26	28	31	30
Winter Oats	37	20	15	23	17	19	18	25	26	25	21
Spring Oats	29	18	20	16	22	19	19	22	28	20	22
All Cereals	27	26	20	20	19	18	22	23	28	26	25
Fodder Beet	54	49	43	44	48	47	51	45	45	50	53
Maize	38	36	32	39	34	33	31	27	38	36	37
Oilseed Rape	-	-	27	-	-	11	23	24	32	18	-
Peas & Beans	14	18	-	-	-	20	-	24	18	-	19

# Cereals: top 20 Fertilisers by Quantity

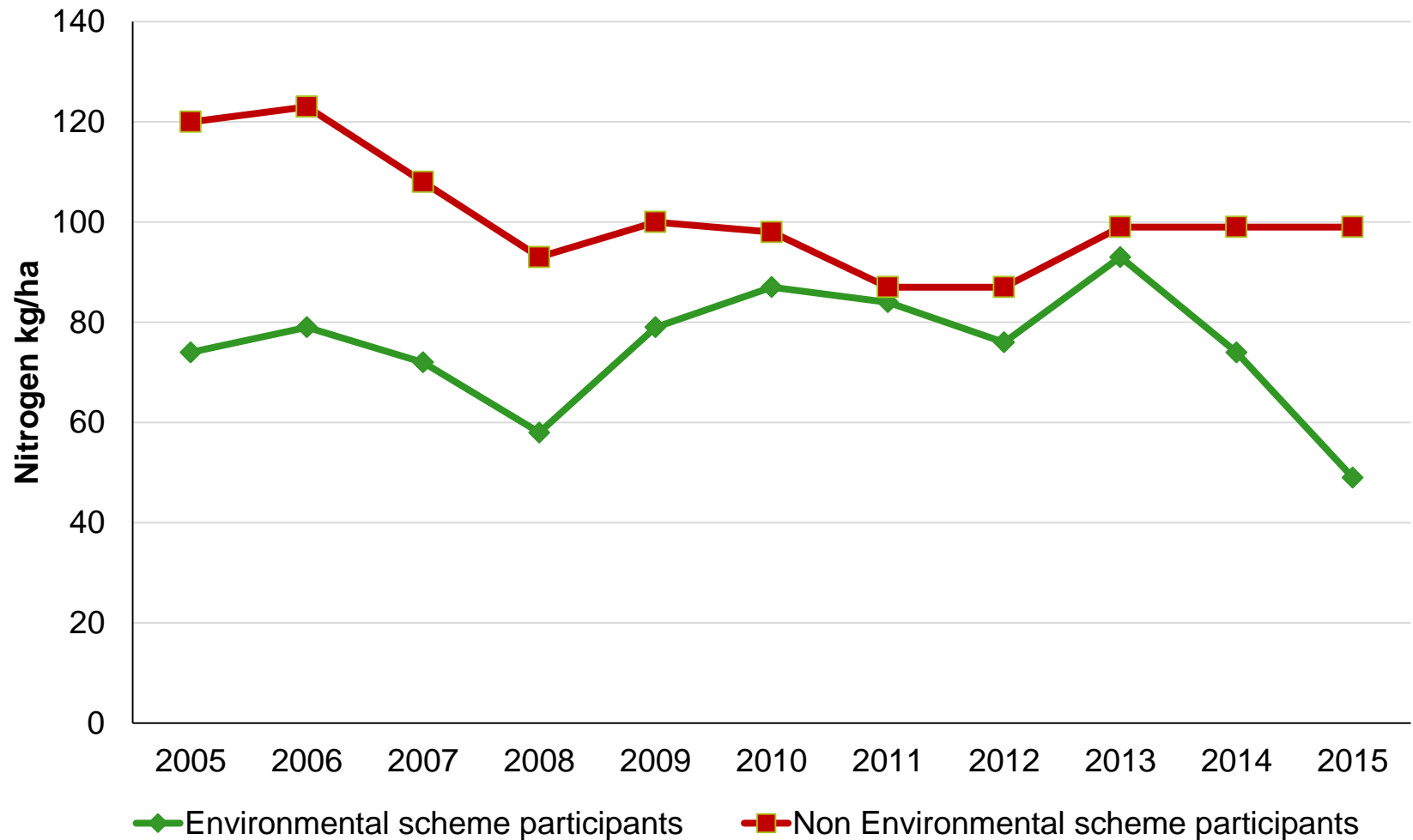
fert - type	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CAN 27 - 0 - 0	47.9	45.8	46.9	46.2	43.8	48	48.6	46.6	41.1	40.3	43.5
18 - 6 - 12	21.7	23.6	20.6	21.9	22	18.1	13.2	10.2	9.3	8.7	8.9
10 - 10 - 20	9.4	9.9	6.4	7.6	5.7	7.9	10.9	13.4	11.1	9.4	8.5
10 - 5 - 25	-	-	-	0.6	-	0.6	0.8	1.8	1.9	2.4	3.8
MOP 0 - 0 - 50	0.2	0.3	0.8	0.7	0.6	2.5	2.4	3.5	2.6	3.4	2.9
26.5 - 0 - 0	0.2	0.2	0.8	0.4	0.3	1.5	0.6	0.5	1.2	1.4	2.8
13 - 6 - 20	-	-	0.9	0.2	1.8	0.5	2.2	3.6	3.4	3.3	2.4
10 - 8 - 20	-	-	-	-	-	-	-	0.2	1	1.3	2.2
10 - 6 - 26	-	-	-	-	-	-	-	-	-	-	2.1
12 - 8 - 20	-	-	-	-	-	-	-	0.3	1	0.5	2
26 - 0 - 0	0.4	0.3	1.8	1.2	2	2.3	2	3.2	6	6.8	2
10 - 7 - 25	-	-	-	-	-	-	1.9	3.7	1.1	3.7	1.7
26.6 - 0 - 0	-	-	0.3	0.5	0	0.1	0.1	0.4	-	-	1.6
25 - 0 - 0	-	-	-	-	-	-	-	-	0.7	-	1.5
15 - 3 - 20	0.5	1	1.6	1.4	1.2	1.7	1.3	2.2	1.2	0.5	1.4
10 - 7 - 23	-	-	-	-	-	-	-	0.3	2.3	1.7	1.1
8 - 10 - 20	4.2	0.3	1.5	0.7	-	-	-	-	1.2	2.8	1.1
14 - 7 - 14	1.5	2.8	3.8	1.5	2.5	2.6	1.5	1.1	1.1	1.1	0.9
8 - 8 - 23	-	-	-	-	-	-	-	-	1	1.2	0.9
Other	14	15.8	14.6	17.1	20.1	14.2	14.5	9	12.8	11.5	8.7
Total	100	100	100	100	100	100	100	100	100	100	100

# **Fertiliser Use:**

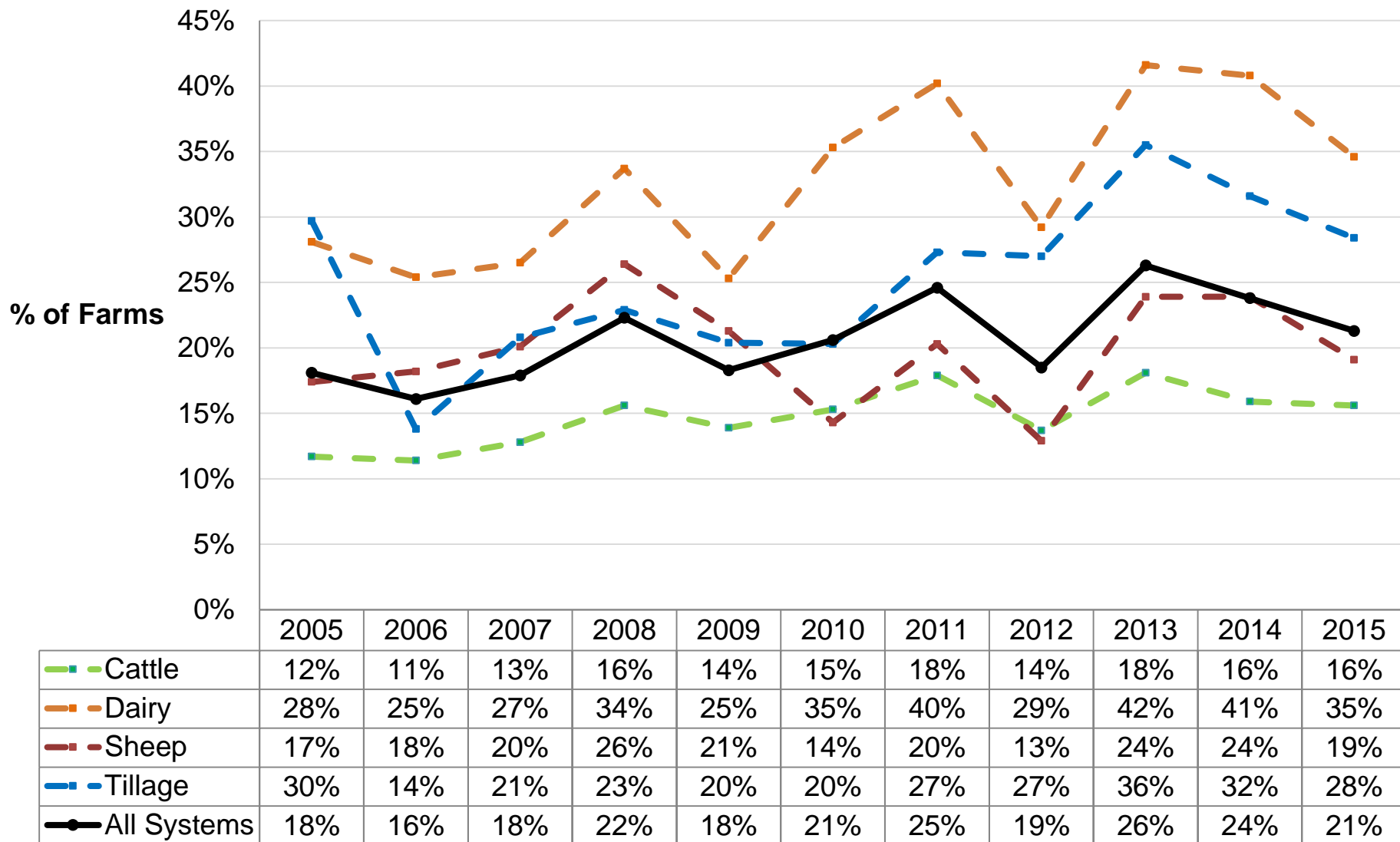
## **Farms in Environmental Schemes**

# Grassland: Nitrogen (*kg/ha*) use

## AE Scheme participants v Non participants



# Lime: use by Farm System







HOME » GRASS » SURVEY INDICATES 'LONG-TERM REDUCTION' IN FERTILISER USAGE

# Survey indicates 'long-term reduction' in fertiliser usage

 **Conor Finnerty** | May 30, 2018, 12:30pm

    6 Shares



# Only one in five farms spreading lime

Teagasc expert says new awareness campaign needed on soil testing and pH plans

**CLAIRE FOX**

AN AWARENESS campaign is needed to increase lime usage, according to Teagasc economist Dr Cathal Buckley.

A new fertiliser survey released from Teagasc notes that only 20pc of farms used lime year on year in the period 2005-2015.

One of the authors of the report, Cathal Buckley, told the *Farming Independent* that more needs to be done to increase lime use on farms.

"Adequate liming is essential to achieve optimum soil pH levels in order to maximise the effectiveness of fertilisers.

but more awareness needs to be created," he said.

Mr Buckley added that lime unlocks nitrogen and phosphorus already present in the soil and is also more affordable than fertilisers on the market.

"It's very cheap and much more affordable compared to fertilisers. Lime is usually around €30 per tonne compared to average fertiliser prices of €250-400 per tonne," he said.

The study is based on analysis of over a decade's worth of data collected by the Teagasc National Farm Survey.

**Decides**

The study indicates that nitrogen, phosphorus and potassium fertiliser application rates on grassland tended to be between 11-16pc higher at the start of the study period compared to



**FARMERS AREN'T OPTIMISING LIME—THERE'S**

the end, with more dramatic declines in application rates noticeable in the mid-study period (23-52pc).

The years of lowest grassland fertiliser use (2008-09) coincided with the period of highest fertiliser prices, while higher than average period application rates in 2013-2014 were associated with the aftermath of a national fodder shortage.

Similarly, the report finds that fertiliser application rates on cereal land were lower in the higher price period of 2008-09. Comparing 2005 with 2015 showed that nitrogen application rates on cereal

on cereal land showed the largest increase, up 33pc in 2015 relative to 2005.

Fertiliser application rates on grassland were on average 36pc lower for farms participating in an agri-environment scheme.

While the report showed that fertiliser application rates were highest in the period following the last major fodder shortage, Mr Buckley said it's too early in the year to suggest that fertiliser usage will increase.

He said the high cost of fertiliser, while nowhere near peak rates of 2008, does dissuade farmers with lower in-

Irish Farmers Journal / News / News / Just 20% of farms using lime

# Just 20% of farms using lime

By Odile Evans on 31 May 2018



The years of lowest grassland fertiliser use (2008-09) coincided with the period of highest prices, while higher than average application rates in 2013-2014 were associated with national fodder shortage.

**The Teagasc Fertiliser Use Survey, published on Wednesday, analyses a decade's worth of data from the National Farm Survey**



# Looking Forward

- How often to publish this report
- More data around lime use
  - ❖ Type and quantity
  - ❖ DAFM talking about grant aiding!!!
- Linking to soil test data – LIMS / NMP on-line?
  - ❖ NFS based soil fertility project?

# Conclusions

- Rates of N application declined slightly from 2005 -2015. P & K use was generally lower than required and fell significantly between 2006 - 2012.
- Grassland: Dairy farmers had highest stocking rates and highest fertiliser application rates for grazed grassland.
- While N applications were sufficient, approximately ½ the required P and ¼ the required K was applied for silage production.
- Straight N and low (N)-P-K compounds dominate on grassland farms.
- Cereals: N applications to cereal crops have remained steady, while P and K inputs increased to match crop offtake, only between 2013 - 2015.
- More high (N)-P-K compound fertilisers were used on tillage farms.
- Fertiliser price, Nut. Regulation and Weather affected fertiliser demand.
- Evidence of lower fertiliser use on farms in [environmental schemes](#).
- Increased lime, P & K fertiliser use required to halt soil fertility decline.