



AGRICULTURE AND FOOD DEVELOPMENT AUTHORITY

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Food Harvest 2020 and the Demand for Fertilizer



T. Donnellan, K. Hanrahan & S. Lalor
Teagasc

Fertilizer Association of Ireland
7th February 2012



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Overview

- Reminder about the FH2020 targets
- Look at historical fertilizer usage
 - In aggregate and by farm system
- Little bit about how we make projections
- Implications of FH2020 for ag. production
- Project future usage of fertiliser under FH2020
- Consider uncertainties that could affect future usage levels

FAPRI-Ireland Baseline and FH targets

- Targets for 2020 relative to average of 2007-2009
 - Milk Target: 50% growth (volume)
 - Beef Target: 20% growth** (value)
 - Sheep Target: 20% growth (value)
 - Pig Target: 50% growth (value)
- First we convert these targets into future animal numbers, prices and output volumes

** Note Beef Activation Group recommended a 40% target

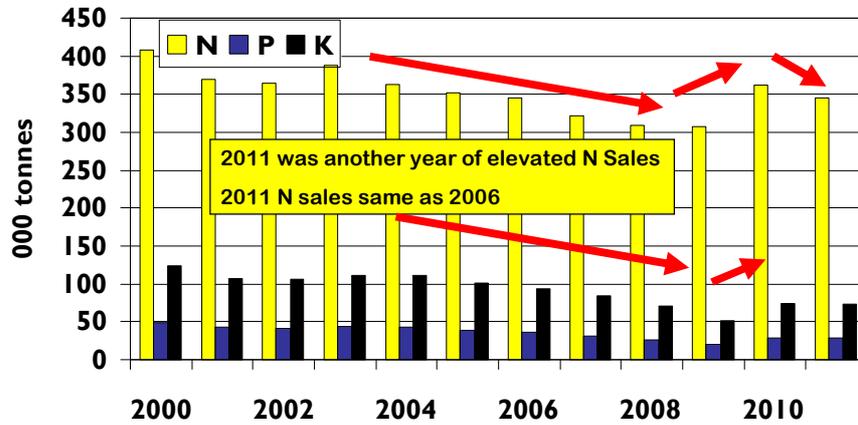
FH2020 Targets

- Gives rise to many questions about future
 - intensity of production
 - composition and size of the Irish cattle herd
 - relative share of grassland and cropland in Ireland
- Implications for future fertilizer use are complex
- Fertilizer usage increases as cows become more productive & stocking density increases
- However, fertilizer use depends also on fertilizer prices relative to feed prices
- Need a model for the agriculture sector with economic and biological relationships

Methodology

- Use FAPRI-Ireland model to specify extent of price and volume contribution to FH2020 targets
- Allows us to identify a set of volume levels for 2020 agricultural production
- From this we can then work back to the level of input requirements

Irish Fertiliser Sales by Compounders 2000 to 2011

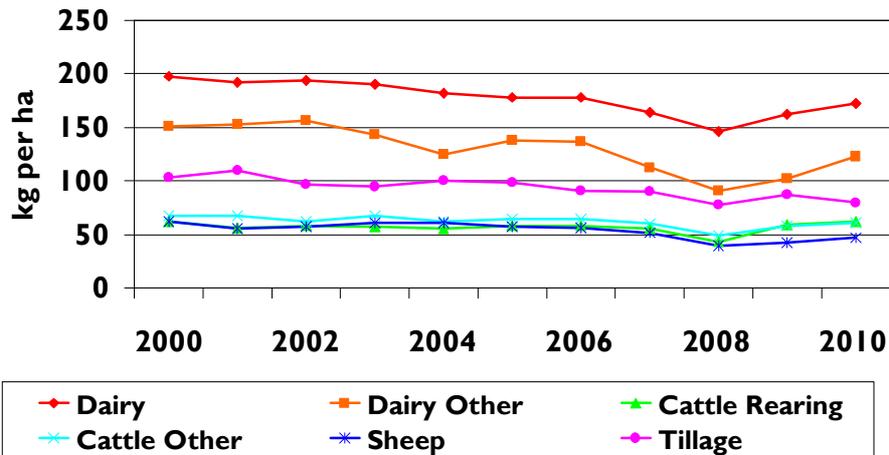


Source: DAFM



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N application per hectare 2000 to 2010



Source: Teagasc National Farm Survey.



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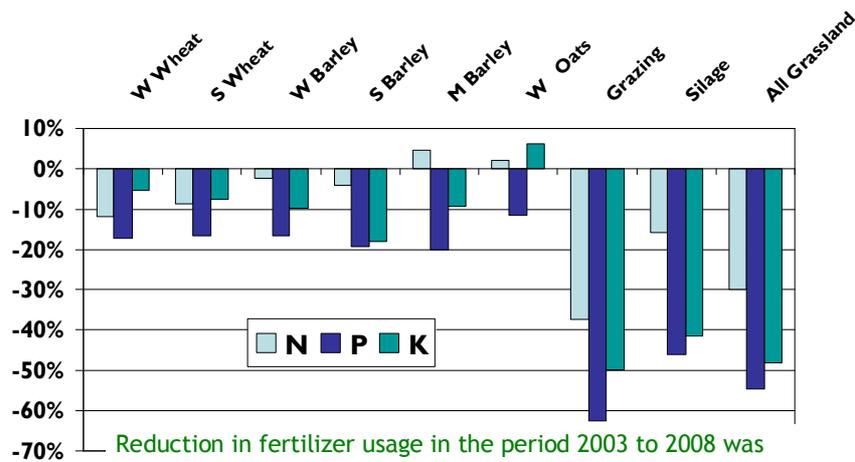
N use by farm system

- **Dairy system (15,500 farms)**
 - Average utilisation rate fell from 200 kg to 150 kg/ha
 - A 25% drop in period 2000 to 2008
- **Dairy other (mixed livestock) system (4,500 farms)**
 - Average utilisation rate fell from 150kg to 100kg/ha
 - A 33% drop in period 2000 to 2008
- **Beef systems (55,000 farms)**
 - Average utilisation relatively constant
 - An average of 50 to 60kg/ha
- **Tillage**
 - Steady slow rate of decrease



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Change in N,P,K usage from 2003 to 2008



Source: Teagasc Fertilizer Use Survey



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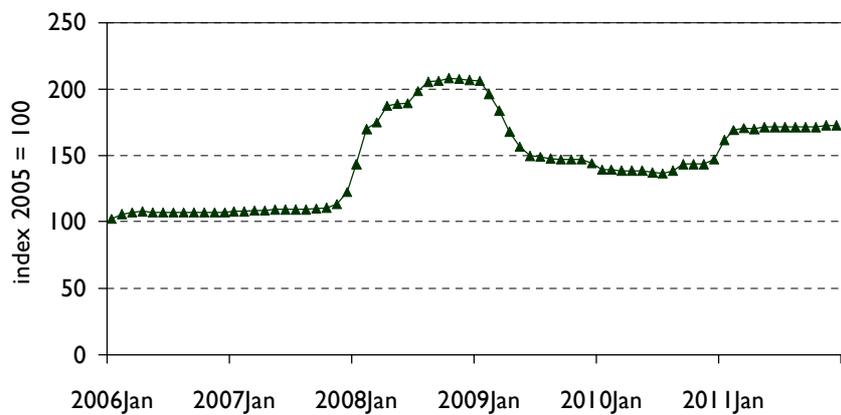
Reasons for Falling Fertiliser Usage

- Relatively fixed volume of agricultural production in Ireland
- Technical progress in agriculture
- Better grassland and nutrient management
- Agri-environmental measures (REPS & Nitrates Regulations)
- Higher fertilizer prices
 - due to changes in relative prices for different fertilizer compounds
- Substitution between the different fertilizer elements
- Decline in potatoes and sugar beet area
- Contraction in the size of the dairy herd



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Fertiliser Prices 2006 to 2011



Source: CSO

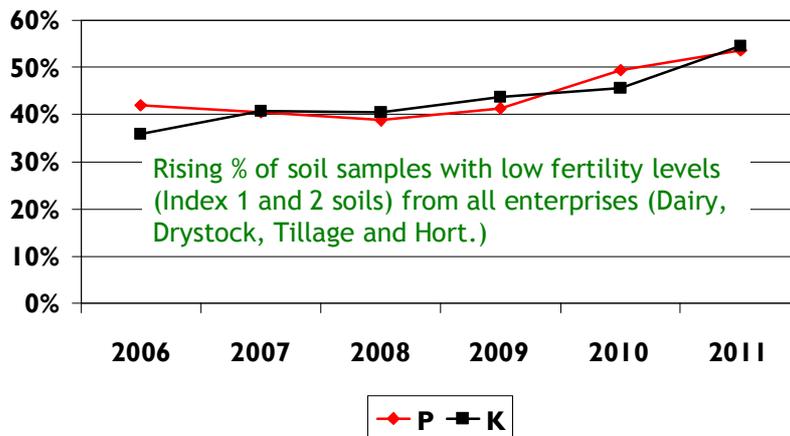


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N use 2010 & 2011

- N use increased in 2010 and 2011
- Reversing downward trend of earlier years
 - e.g. N sales back up to 2006 levels in 2010 & 2011
 - notable given that fertilizer prices in 2010 & 2011 were considerably higher than in 2006
 - strong consumption of fertilizer partially explained by the simultaneous rise in commodity prices

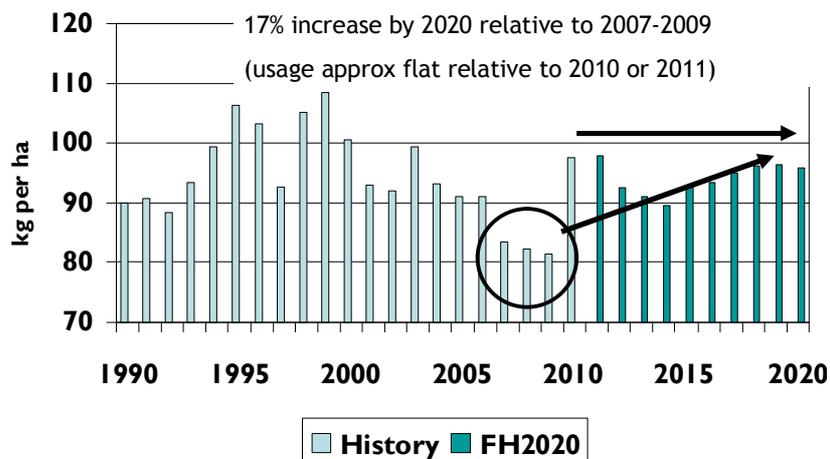
% of soils (Index 1 and 2) with low P and K fertility status



Implications of Changing Fertilizer Usage for Soil fertility

- Decreasing soil P and K fertility in recent years
- An increasing percentage of soils with low P and K fertility.
 - low P fertility soils has increased from 39 percent in 2008 to 53 percent in 2011
 - low K fertility soils has increased from 40 percent in 2007 to 52 percent in 2011
- Soil fertility levels in the target Index 3 range considered essential for intensive farming systems

Intensity of N usage on grassland in Ireland



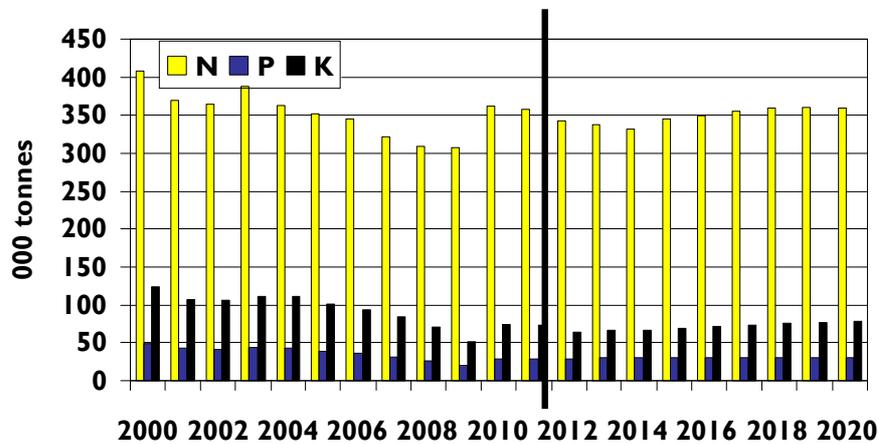
FH 2020 and grassland N usage

- Increased intensity of dairy in FH2020
 - causes some increase in N use
- Partially offset by reductions in suckler herd
- Projected 17 % increase in N usage per hectare of grassland by 2020
 - relative to the level in the FH2020 reference period of 2007-2009
- N use in 2007-2009 was at a 50 year low
 - increase is not spectacular when placed in context of average usage levels in 2000s

Dairy growth main volume driver in FH2020

- Grassland agriculture will be increasingly driven by the evolution of Irish dairy herd
- Total cattle population to increase despite falling suckler herd
 - More calves from more dairy cows
- Cereal area to contract slightly
- N fertilizer use likely to be maintained by dairy sector demand
- Total N demand on other farms likely to be lower

Irish Fertiliser Sales by Compounders projected to 2020



Source: DAFM (historical data) & FAPRI-Ireland Model (projections)



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Other Factors to Consider in the period to 2020

- **Changing grassland management**
 - Favouring grass over feed
- **Relative input prices**
 - Price of feed relative to fertiliser
- **Impact of live cattle trade on cattle population**
 - Live exports affect cattle intensity
- **Potential CAP reform**
 - Disadvantage intensive production ?
- **Environment & climate change concerns**
 - GHG emissions, Nitrates derogation



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Conclusion

- Volume growth in FH2020 to come from increased milk production
 - Additional dairy cows and associated replacements and surplus dairy progeny reared for beef
- FH2020 will generate some additional demand for fertilizer application
- Several caveats which could affect fertilizer demand need to be kept in mind
- Responsible and efficient use of fertilizers remains critical for sustainability of the sector and the environment

Thank you

How can the beef target be achieved ?

- Decline in suckler herd does not mean beef production declines
- Increase in dairy cows and progeny more than offsets suckler herd reduction
- Irish beef production actually increases
 - But driven by FH2020 milk target
- Changing composition of the total cow herd,
 - slaughter weights are projected to decline, but beef production to rise projected by 9 percent by FH2020

Grassland Management & Land Use

- How will grassland agricultural practices develop in current decade?
- Displacing concentrate feed usage by grass and silage ?
- Higher levels of fertilizer application on land used in dairy
- The story on the beef and sheep side is somewhat different. The targets set for these sectors can be met as least partially through higher output prices

Fertilizer versus Feed Use

- So long as increases in output prices are matched or exceeded by increases in input prices, significant changes in output volumes are unlikely
 - except where other policies (e.g. the milk quota system) have been a constraint on production.
- Relative feed and fertiliser prices will be important
 - Imperfect substitutes in production

Live Cattle Trade

- Typically representing 10 to 15 percent of total cattle disposals in any given year
- Dairy expansion would reduce the number of female calves available for fattening
 - but volume of dairy bull calves is likely to increase
- Animals exported as calves or raised for slaughter here ?
- Will depend on factory/export prices
- Greater live trade would erode growth in Irish cattle population over time
- Less pressure for increased fertilizer usage nationally

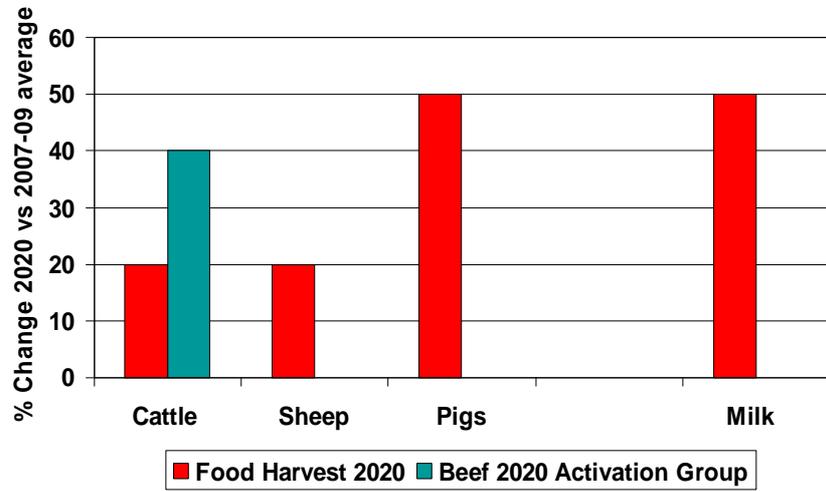
CAP Reform

- FH2020 recommendations abstracted from CAP Reform
- CAP reform debate is centred around proposals to flatten the subsidy per hectare
 - national or regional flat rate average direct income support payment.
- Flattening would disadvantage more intensive production systems.
- Are payments fully decoupled (in farmers' minds) ?
- If production is linked to receipt of “decoupled” support
 - Some negative production consequences
 - Adverse impact on fertilizer demand

Environmental and Climate Change Concerns

- Nitrogen a key consideration in term of GHG emission from Irish agriculture
 - Non-ETS must reduce emissions by 20 percent by 2020
 - Internationally fertilizer tax or a system of GHG emission quotas for agriculture advocated
 - Teagasc is researching the potential of technologies and novel farming practices
- Other environmental concerns regarding fertilizer use
 - Maintenance of Irish nitrates derogation
 - allow higher farm stocking rates and fertilizer application rates
- FH2020: increases in agricultural activity must be achieved in an environmentally sustainable manner

FH2020 Targets



Note: The milk output target is a volume target. All other targets are in value terms.



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