Regional Conference
Closing the mineral cycles at farm level – Good practices to reduce nutrient loss in Southern and Eastern Ireland (Conference Proceedings)

Tuesday, 28 October 2014
The Killeshin Hotel, Dublin Road, Portlaoise, Ireland

Aim of the conference and participants

This conference aimed to present the results from the EU project "Resource Efficiency in Practice - Closing Mineral Cycles" and especially the identified good practices for Southern and Eastern Ireland; to highlight farmers experiences in particular on successfully implementing good practices; and to initiate discussions among the participants on identifying solutions and the need for further actions to effectively address the nutrient surplus in the region.

In total around 45 people participated representing farmers, farm advisers, civil servants from environmental protection agencies and from regional and local governments, representatives of farmers unions, researchers and students.

Identified good practices for the region

A selection of six good practices for the Southern and Eastern Ireland region was presented by Victoria Cherrier, a project partner from AMEC. The presentation aimed to clarify whether the practices fit well in the context of the region, are well accepted by the local stakeholders and what are the success factors and barriers to implementing them. They included:

- using appropriate application techniques to decrease ammonia emissions, avoid leaching and run-off and improve mineral uptake
- determining the appropriate timing and amount of application
- incorporation of manure
- increase grazing duration and rotational grazing
- organic farming
- transfer of manure

Key messages from the presentations

Five regional stakeholders presented about addressing nutrient loss in Southern and Eastern Ireland. The presentations ranged from practices implemented at the farm level to the policy and financial support framework for resource efficiency in agricultural areas.

Cathal Buckley, a representative of the Agricultural Catchments Programme under Teagasc – the Agriculture and Food Development Authority, presented data derived from the Teagasc National Farm Survey regarding sustainability indicators for nitrogen and phosphorus and improvements in nutrient use efficiency. Both nitrogen and phosphorus balances declined between 2006-2012, resulting in both average nutrient reductions and cost savings for

farms. Percentages for application of nutrient management practices throughout the region reflected low uptake for some practices, e.g., nutrient management planning despite high percentages of soil testing. Simple and targeted information on managing soils was suggested to help increase the uptake of nutrient management planning.

A farmer and agricultural advisor team, Joseph Doyle and Edward Burgess, then presented about the many positive changes experienced on Mr. Doyle's farm within the Agricultural Catchments Programme due to implementation of recommended nutrient management practices. Soil testing identified that phosphorus and potassium levels were low and very low in various locations throughout the arable fields, which were increased across the farm through nutrient management planning integrating cover crops into the rotation and supplemental organic fertiliser. Targeted nutrient management may therefore require nutrient application increases in some cases while simultaneously aiming to reduce nutrient losses from the farm.

Harold Kingston, of the Irish Farmers Association, highlighted multiple knowledge transfer resources available to support nutrient management at the farm level. In particular, he spoke about the opportunities for cost savings, resource efficiency improvement, and environmental benefits through the organisation's Smart Farming programme. Win-win or double-dividend measures were emphasised as practical for farming businesses as well as the environment.

Finally, Jack Nolan, of the Department of Agriculture, Food and the Marine, presented about the regulatory framework and available financial support to address nitrogen loss in the region. In particular, the Irish Nitrates Action Programme limits nitrogen and phosphorus application to certain levels, and the Agricultural Catchments Programme involving around 300 farmers and advisors has resulted in improved nutrient balances and loss reductions. Wider improvements in nitrate and phosphorus concentrations have been found as well and overall nutrient use efficiency is increasing.

Results from the working group discussions

1. *Success factors and barriers to the uptake of good practices*

The group discussions revealed the level of farmer awareness with regard to the six good practices for avoiding nutrient loss suggested for the region and aimed at identifying various factors impacting the uptake of such practices at farm level. The best mechanisms agreed by the participants to encourage implementation of good practices are:

- an independent advisory/extension service with the capability to work closely with farmers to adopt the technologies and with a clear focus and objective to improve nutrient efficiency and balance. A service with this focus exists in Ireland but with insufficient resources to support all farmers.
- soil analysis was identified as an important tool for effective nutrient management planning. As revealed during the first plenary session, soil analysis may be done at the farm level but is often not followed by interpretation of the results to create a plan for reducing nutrient loss.
- research was identified as having an impact in two ways. Firstly, research can provide a basis for effective policy making to target the problem with appropriate solutions. Secondly, research is also required to achieve adoption of practices by farmers. Farmers need to know that practices are effective in terms of achieving better

nutrient efficiency, cost and benefits, and that they can be incorporated into farming systems.

- a targeted approach would be needed to reduce nutrient loads in vulnerable areas and increase nutrient efficiency while developing farm business opportunities and competitiveness.
- an emphasis on the quantified financial benefits from improved nutrient efficiency.
- highlighting the environmental benefits from reduced nutrient losses as well as synergies to other initiatives which may exist, such as reduced nitrogen losses also contributing to greenhouse gas emission reduction targets.
- a weather warning service to avoid nutrient spreading at inappropriate times.
- continued integration of nutrient management and efficiency recommendations into mainstream advisory services.
- utilisation of various communication methods (e.g., newspapers, radio, etc.) to connect with farmers and highlight good practices, as well as dissemination of research to important support entities for farmers (e.g., consultants, suppliers) for up-to-date knowledge transfer.

2. *New and innovative practices*

An innovative practice discussed was the use of colour-coded maps for nutrient management plans. The participants identified this as a way to make the data generated by soil analysis and other requirements into useful and directly applicable tools for farmers. The success of this practice lies into its simplicity and its ease of use.

Another practice is the use of mobile phone applications ('apps') to provide advisory support to farmers on when or where to spread. The advisory nature of the practice was emphasised: these tools help farmers but ultimately farmers know their farm best and need to make their own decisions.

Software-led spreading practices such as application timing management systems (ATMS) were highlighted as being generally effective but quite costly and in specific cases experiencing implementation difficulties. They are taken up by some early adopters, but otherwise they represent an investment which may not be realistic for the majority of farmers.

Other techniques discussed were: the potential for agro-forestry to improve nutrient uptake and provide shelter for grass, biodiversity and mitigate flooding; the use of hydrometers in slurry tankers in order to monitor what is spread; the testing of fertiliser and the testing of forage.

Some innovative practices may not be 'new' but rather re-discovered; for example, promoting the use of perpendicular ploughing. In addition, possible knowledge transfer from tillage farming to grasslands was discussed.

The group discussions highlighted several important points:

- One-size-fits-all is not a suitable approach due to local variations;
- To be successful, practices need to be simple to implement and provide clear economic benefits to farmers;
- Raising awareness and knowledge transfer remain a very important part of improving nutrient management.

3. *Potential for cooperation and joint actions*

The discussion first aimed at identifying various examples of cooperation and joint actions.

- Transfer of manure/slurry (particularly from pig enterprises to tillage and grass)
- Satellite finishing of pigs and dairy heifers
- Shared slurry/manure storage
- Dairy partnerships
- Machinery sharing
- Purchasing Groups
- Producer Groups
- Contract growing
- Share farming
- Local co-ops
- Skill transfer

With regards to implementation of these types of cooperative and joint actions, barriers to uptake were then discussed. There were issues with sufficient advisory support to implement these approaches, whether due to the focus on regulatory compliance, lack of sufficient advisors, or changing knowledge and education through continuing research. Market requirements were identified as a potential barrier to uptake, as well as the funding necessary to adopt certain practices, restrictions on joint actions under some national regulations, contract complexity, and licensing requirements. Lack of understanding of new technology can create a barrier to uptake, and other factors such as age of farmers, the local farming culture and traditions, and trust of other farmers may influence farmers' willingness to cooperate or enter into joint endeavours.

Possible solutions identified to overcome these barriers were:

- Farm visits
- Demonstration projects
- Farmer-to-farmer discussion
- Formal discussion groups (knowledge transfer)
- Include other agencies/stakeholders in the discussion
- Ownership (if the initiative is farmer-led, other farmers will follow)
- Communication – local radio, buy & sell websites, blog sites, networks
- Farming organisations
- Education
- Economics – value of slurry, value of leasing
- Show benefits of complementary farming enterprises working together
- Rainwater harvesting
- Work with environmental groups
- Use of "natural" treatment systems – integrated constructed wetlands

4. *Fine-tuning the legal framework and financial support*

Various voluntary mechanisms were identified by participants to encourage uptake of nutrient management practices. The "Smart Farming" initiative, involving the Irish Farmers Association and the EPA, was highlighted as providing a 'double dividend' – it encourages both environmental and economic sustainability by reducing nutrient losses and saving farmers money. Through this initiative, farmers can become more aware of environmental issues, which may not result from the use of regulation.

Rural Development Programme (GLAS) measures are another voluntary mechanism that can encourage uptake of these practices with the additional funding provided. This mechanism may target priority catchments, thereby reducing losses from hotspots. More advisory support, including farmers paying for an advisory service; however, not enough do this. In terms of nutrient management though, advisors may not know enough about the environment and may be too development-oriented and oriented towards compliance rather than generating greater environmental awareness. Other knowledge transfer mechanisms such as 'peer to peer' meetings of farmers, facilitated by farm advisors, collaborative research ('social learning') where scientists and farmers learn from one another, and use of media can encourage uptake of practices as well.

The regulatory mechanisms to encourage uptake of nutrient management practices are the Irish Regulations (GAP), which the participants considered to be good overall. Regulation should be mixed with incentivised schemes for an optimal approach to uptake though. The groups highlighted that there should be more explanation and emphasis placed on the benefits of regulations as, without a clear understanding of regulations' goals and benefits, farmers tend to comply to prevent being caught rather than because they believe the practices promoted by the regulations are good.

Some research projects (Agricultural Catchments Programme and Pathways Project) provide a good scientific basis for targeting measures. Also, allowing for provision of nutrient management advice prior to regulatory compliance inspections could enable a greater understanding of the impact of farming on the environment (i.e., catchment officers who engage with the farmer rather than simply enforce). This could help in increasing farmers' commitment to nutrient efficient practices and avoid environmental concerns to be seen as a burden. 'Integrated catchment management' is an important process that has worked elsewhere, but it could take a lot of time before significant progress is made and may encounter resistance as another form of management control.

Financial support is an element that can be important to implement management practices to reduce nutrient losses. For instance, some participants suggested that more support could be provided for buffer zones and to encourage the use of good nutrient management practices, e.g., use of clover. Measures need to be targeted and tailored to where they provide the optimum environmental benefit; 'one-size-fits-all' measures are often not effective. This can lead to winners and losers in the financial aid scheme, which is a difficult issue to sell to farmers and get their buy-in.

More resources are needed for knowledge transfer and a good advisory service which takes account of both the needs of farmers and the water bodies is essential. Encouragement of land transfer to younger farmers in the recent budget was considered a good policy by the participants, as well as providing an incentive to encourage farmers to get the 'green certificate'.

Key messages and conclusions of the conference

Summarising the results of the presentations, panel and the working group discussions, the following most important messages emerged:

1. To encourage widespread uptake of good practices and sustained management to increase nutrient efficiency, both the environmental benefits and the benefits at the farm business level should be emphasised.
2. Knowledge transfer and awareness raising are extremely important aspects which have been implemented widely within the Irish farming context, though continuing research developments and improvements in the availability and provision of advisory support could contribute to even more uptake and positive environmental benefits.
3. Good practices must be targeted and tailored toward the individual farming context in order to achieve the most efficient and appropriate nutrient loss reductions – "one-size-fits-all" strategies are not appropriate.
4. Lag-times must be accounted for and recognised as part of the implementation process for good practice measures. Benefits may not materialise until a certain amount of time has passed, so practices should not be abandoned simply because immediate improvements are not seen. Rather, long-term benefits should be recognised and valued.
5. Fostering farmer-led initiatives to increase nutrient efficiency and reduce nutrient losses will increase ownership of solutions and help ensure sustainability of adoption.