

Do organic and recycled nutrient sources stack up in arable cropping?

Patrick Forrestal and S.M. Ashekuzzaman

Teagasc, Crops, Environment and Land Use Programme

Johnstown Castle, Co. Wexford

The importance of crop quality as well as yield and economics has resulted in arable farmers becoming leaders in **tailoring nutrient amount and timing** to precisely meet crop requirements and in actively managing their soil resource. Mineral fertilisers have proven to be a convenient and a consistent source of nutrients for many years. However, there is a growing interest in the potential long-term **soil health** benefits of including other sources of nutrients such as organic or recycling derived fertilisers. These fertilisers often deliver other nutrients in addition to nitrogen, phosphorus and potassium to soil along with carbon.



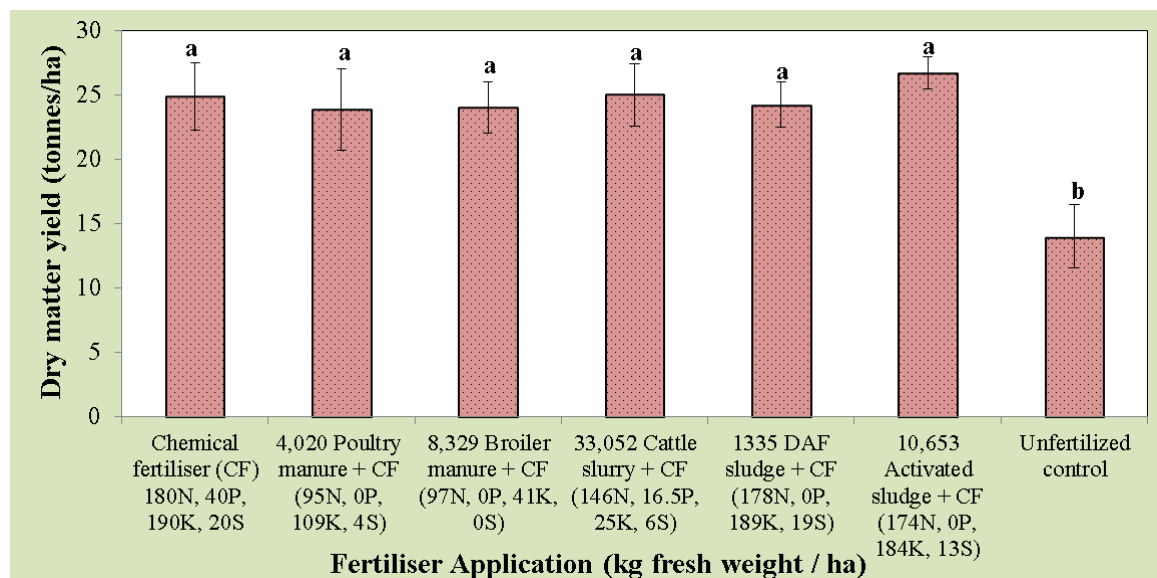
The recently published EU farm to fork strategy envisages a 20% cut in conventional fertiliser usage by 2030 and sets ambitions for improving soil health. Incorporation of organic and recycling derived fertilisers is likely to become an increasingly essential part of the nutrient supply which farmers will closely manage in the future. However, there are open questions regarding the benefits, challenges and practicalities of incorporating such options into cropping fertiliser programmes. As part of the EU H2020 funded **Nutri2Cycle** project, we have established an on-farm multi-year research and demonstration trial in collaboration with Teagasc tillage advisor Martin Bourke and specialist Mark Plunkett. In this trial the **agronomic performance, practicality, economics and soil health effects** of using organic and nutrients recaptured via processing will be evaluated and demonstrated to farmers over the coming years.



The Nutri2Cycle on-farm arable site where fertiliser programmes incorporating organic and recycling derived fertilisers will be applied to the same plots for each rotational crop (spring wheat 2020).

Performance of programmes in using organic manures/ recycled residues to date

The crop grown in the first year of the trial, 2019, was maize. Maize has a high nutrient demand. Maize can be an extremely high yielding crop and makes an excellent buffer feeding supply for high performing animals such as dairy cows when grass supply is limited. Fertiliser programmes incorporating poultry manure, broiler manure, cattle slurry, and two types of dairy processing sludge performed as well as a mineral fertiliser only programme giving yields of c. 25 t DM/ha.



Significant fertiliser cost savings of 23-37% on mineral fertiliser were achieved without compromising yield. Soil health effects and the benefits of recurring applications of organic manures will be measured and demonstrated over the coming years of the experiment.