# The slurry hydrometer – Do farmers view it as a useful decision support tool for nutrient management?

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# Introduction

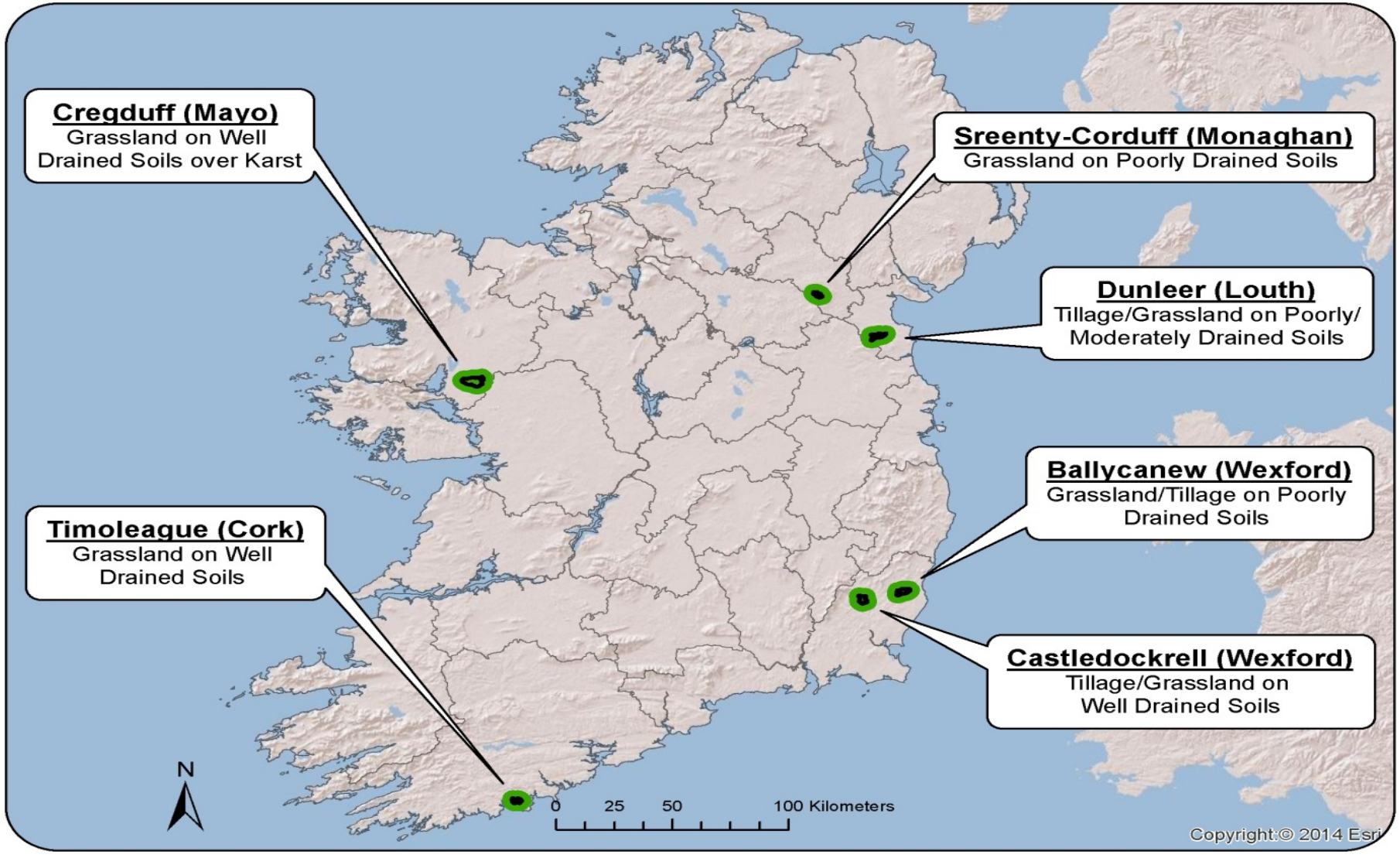
- Berry (2013)
  - The nutrient content of cattle slurry is known to be highly variable.
  - Laboratory analysis
    - Representative sample without agitation
    - Slurry agitation is usually carried out immediately prior to land spreading
    - Time lag in getting lab results back
  - Need for “quick tools” on farms can permit on-the-spot estimates of nutrient concentrations in slurry.
  - Slurry hydrometer to be the most useful quick tool and the one they would be most likely to purchase.

# Slurry Hydrometer

- Measures the density of slurry
- Dry matter (DM) % of the slurry is estimated from the graduated scale
- DM% is directly correlated to nutrient concentration (Tunney and Molloy, 1975)
- First patented by Tunney in 1976.
- The hydrometer has little or no recognition among farmers
- No Irish suppliers - Difficulty sourcing 40 for the trial!!!

RQ Is the slurry hydrometer is a useful decision support tool for nutrient management on farms?

# Trial of hydrometer across Agricultural Catchments Programme




http://www.teagasc.ie/agcatchments/

# Trial of Hydrometer

- 4 Teagasc ACP advisors approached farmers
  - **Asked farmers to trial the hydrometer**
  - **Hydrometer, sampling jugs and instructions**
  - **Conversion table**

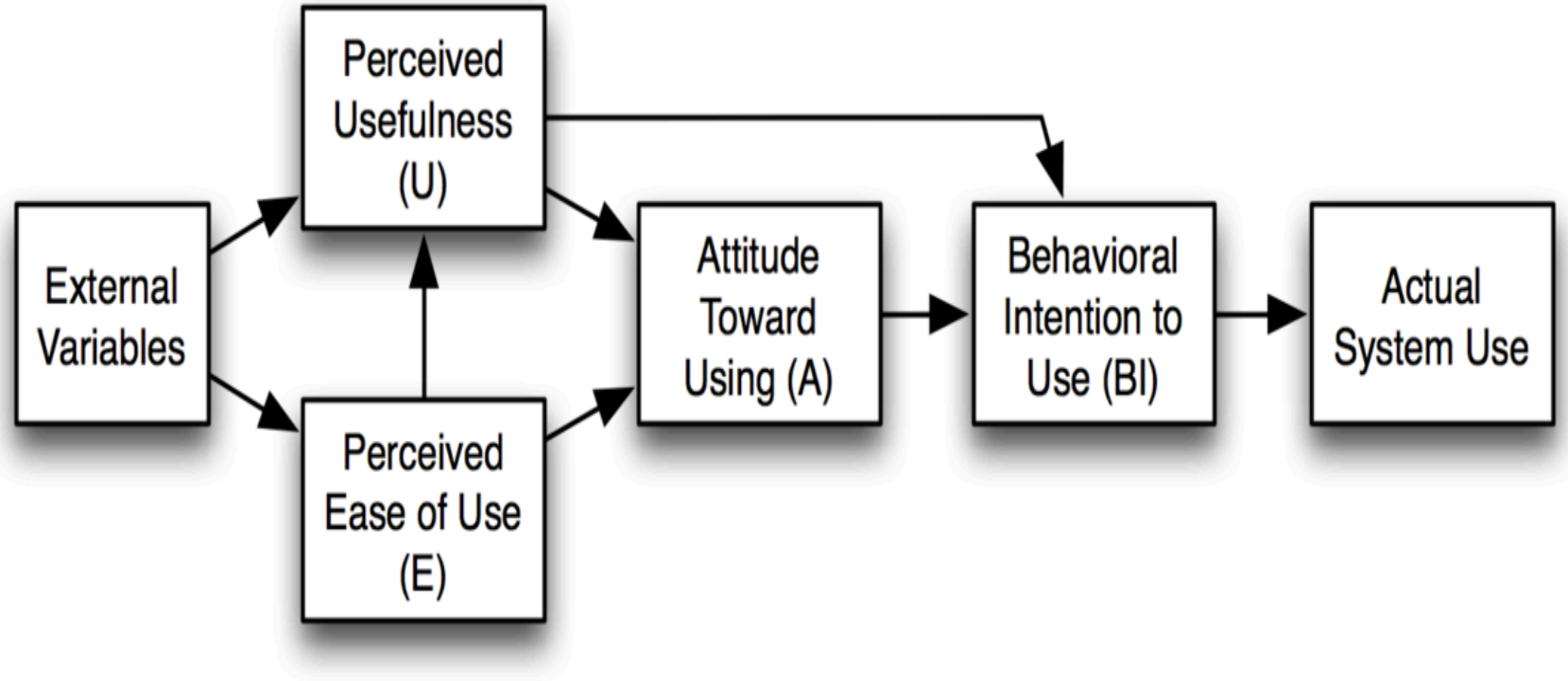
- 38 hydrometers handed out to farmers across 6 catchments
  - **Farmers with significant quantities of slurry**
  - **Not random but not hand picked**

- 25 had trialled hydrometer by mid-summer
  - **Dairy farmers (45%), Livestock rearing (40%), mixed arable/livestock (15%).**

# Equipment

| Slurry | Dry Ma % | | |

# Technology Adoption Model (TAM)




**Davis et al., 1989**

| Perceived usefulness | Agreement Score (1 to 5) |
|---|---|
| Use of hydrometer will lead to improved slurry management decisions | 4.44 |
| Use of hydrometer helped me to meet my farming objectives | 4.12 |
| Use of a slurry hydrometer will help increases my profits | 4.12 |
| Use of a slurry hydrometer is better than what it replaces | 4.08 |
| Use of a slurry hydrometer will increase productivity on my farm | 3.88 |
| Use of a slurry hydrometer fitted well with my existing farm practices. | 3.52 |
| **Perceived ease of use** | |
| Results from the hydrometer are easy to understand | 4.36 |
| Results from hydrometer are easy to interpret and put into practice | 4.24 |
| The hydrometer is easy to use | 4.12 |

# Future Intentions

| I plan to use the slurry hydrometer for nutrient management decisions making again in the next 12 months? | | |
|---|---|---|
| | Number | % |
| Disagree | 3 | 12.0 |
| Agree | 6 | 24.0 |
| Strongly agree | 16 | 64.0 |
| Total | 25 | 100.0 |

| **Intention** | **Perceived usefulness of hydrometer** | **Perceived ease of use of hydrometer** |
|---|---|---|
| **I plan to use the slurry hydrometer for nutrient management decisions making again in the next 12 months?** | +** | + |

**** 1 per cent significance level**

# Results from using hydrometer / behaviour change?

| | Lower than expected values | In line with expected values | Higher than expected values |
|---|---|---|---|
| Nitrogen | 12% (3) | 32% (8) | 56% (14) |
| Phosphorus | 4% (1) | 28% (7) | 68% (17) |
| Potassium | 4% (1) | 24% (6) | 72% (18) |
| Total | 7% (5) | 28% (21) | 65% (49) |

- 16% where all 3 were N,P,K in line with expectations

| Did you change slurry application rates following results from the slurry hydrometer? | |
|---|---|
| Yes | 44% (11) |
| No | 56% (14) |

- Farmers need more time to use / evaluate
- Integrate into nutrient management routines
- Longer time series for study needed / Increase sample size

# Summary of case study to-date

- 25/38 farmers have trialled to-date
  - Non users?
- Early days but:
  - High scores on usefulness and ease of use metrics
- High level of initial intention to persist with use
  - Usefulness correlated to intention to continue using
- Longer time series needed for farmer and for us to observe use patterns
- Is the slurry hydrometer is a useful decision support tool for nutrient management on farms?