

Determining the Potential of Enhanced Rock Weathering (ERW) of Rock Dust to Co-deliver for Healthy Soils and Improved Crop Protection against Pests

S.A.Obeng¹, S. Flynn¹, M. Edward¹, G. Stewart¹, M. Wakefield², L. Collins², D. Manning¹, K. McInnes¹

¹Newcastle University, UK,

²Fera Science Ltd., Sand Hutton, York, UK



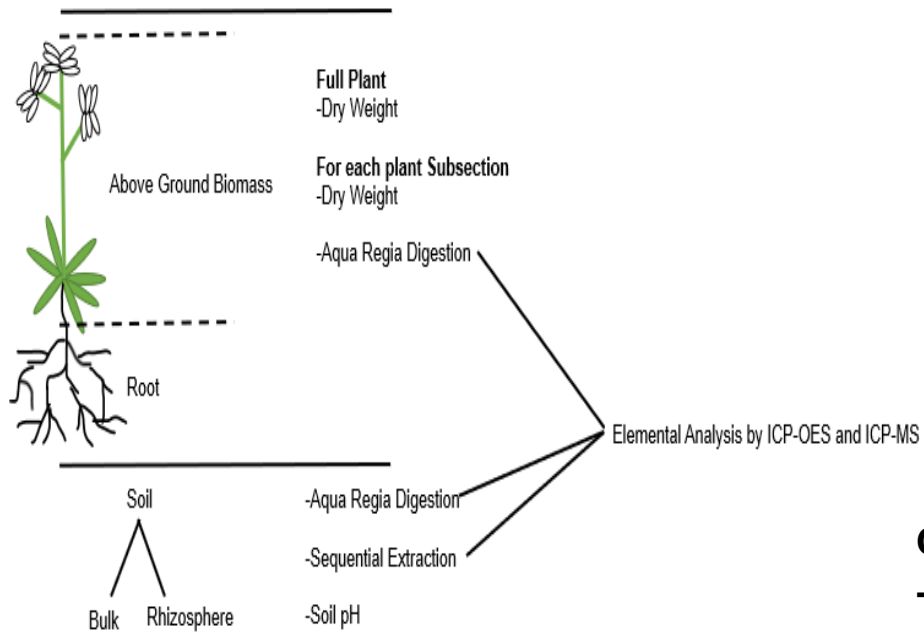
Project Overview

- ❖ The agricultural systems in the UK are evolving to co-deliver for sustainable food production
- ❖ One such practice is amending soils with crushed calcium- and magnesium-rich silicate rocks to accelerate atmosphere CO₂ sequestration
- ❖ Enhance physical and biochemical crop defences against pests and diseases on the agricultural landscape.
- ❖ The imminent of applied silicate rock dust for augmenting soil and plant health is well-documented in tropical systems.
- ❖ Still, there is a paucity of information on the application of rock dust in agroecosystem temperate climates.



Source: Fitch Solutions, 2023

Post Growth Analysis



Examining two plant types:

- Oil Seed Rape
- Wheat

Two rock types:

- Nepheline-syenite tailings
- Basalt

Four application rates, plus controls:

0, 1.25, 5, 10 and 20 g/kg

160 individually potted plants

Water source: Distilled water

Choice tests

- Slugs used (intermediate (100–200 mg))
- 1 slug per cage*10 replications

No choice bioassay

- wheat aphids
- slugs

Target gene:

- six pathway genes (biomarkers)
- 2 genes selected from jasmonate, ethylene and salicylic.



Limited Nutrient Sources

Soil: Cleaned pure silica sand, and peat

Water: Ultra Pure

Single: Ammonia nitrate fertilizer at 2 weeks