

Data Quarry: Variable List

Version 10.09.2024

Data must be:

1. Sample-level measurements, at all depths and times, from control and treatment plots
2. Interoperable, meaning units, relevant methods and other metadata are shared for all fields following FAIR Data Principles (go-fair.org/fair-principles/),
3. Exclude any personal identifiable information (PII), including but not limited to: farmer name, email, address, exact geolocation that could identify an individual farm, etc.
4. Consistent with Ag Data Transparency Principles (agdatatransparent.com/principles), including a) Farmers consenting to data sharing and b) Data is anonymized to a level that prevents farm and farmer identification. Default anonymization will be watershed + County / District unless otherwise agreed upon.
5. Data for public release (including time and measurement depth, if applicable):
 - a. Feedstock screen of all metals: arsenic (As), cadmium (Cd), cobalt (Co), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), manganese (Mn), nickel (Ni), thallium (Tl), uranium (U), vanadium (V) and zinc (Zn)
 - b. Feedstocks: asbestos and asbestiform minerals, radioactivity
 - c. Soil and biomass levels of metals deemed relevant from baseline and post application time points
6. Data for release to Data Quarry (including time and measurement depth, if applicable):

Regardless of measurement approach

- Feedstock screen of all metals: arsenic (As), cadmium (Cd), cobalt (Co), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), manganese (Mn), nickel (Ni), thallium (Tl), uranium (U), vanadium (V) and zinc (Zn)
- Feedstocks: asbestos and asbestiform minerals, radioactivity
- Soil and biomass levels of metals deemed relevant from baseline and post application time points
- Current and past application rate and dates
- Soil pH and buffer pH
- Feedstock particle size distribution
- Feedstock mineralogy
- Net infiltration (total, combined irrigation + precipitation - evapotranspiration)
- Regional climate (elevation (rounded to nearest 100m), county or similar administrative district, mean quarterly temperature rounded to the nearest degree C)
- SOC
- Bulk density
- CEC
- Base saturation
- Soil texture
- Crop type
- Tillage type, depth and frequency
- Fertilizer if using to constrain strong acid (priority: N, Sulfur, Carbonates (e.g. Ca), can be total seasonal levels)
- If measured: Soil inorganic carbon

If using aqueous measurements

- Dissolution rate: include time unit
- Dissolution rate measurements:
 - Two of three: pH, total alkalinity, DIC
 - Net infiltration over time
- Major cations
- Major anions

If using solid phase (soil) measurements

- Dissolution rate: include time unit
- Dissolution rate measurements
 - Example: Mobile (e.g. Ca) / immobile (eg. Ti) tracer element concentrations
- Element-specific base saturation
- Total uptake of cations in removed biomass