Manure injection/Incorporation Expert Panel Update

Ag Workgroup

Sept. 16, 2015

Committee Membership

- Curtis Dell, USDA-ARS, Panel Chair
- Arthur Allen, UMES, Panel Member
- Dan Dostie, USDA-NRCS, Panel Member
- Robb Meinen, Penn State, Panel Member
- Rory Maguire, Virginia Tech, Panel Member
- Chris Brosch, VT/VADCR, Watershed Technical WG rep.
- Jeff Sweeney, US EPA, Modeling team rep.
- Mark Dubin, UMD, AgWB Coordinator
- Lindsey Gordon, CRC, staff
- Emma Giese, UMD, former staff

Progress

- Stake holder meeting/panel work session Aug. 11-12
  - One stake holder presentation
  - Developed BMP definition and road map for lit search
- Literature search ongoing

Proposed BMP Definition

- **Incorporation** is defined as the mixing of dry, semi-dry, or liquid organic nutrient sources[1] into the soil profile within the Panel's specified time period[2] by a range of field operations. These methods can provide nutrient loss reductions and may differ for P and N by method used. Nutrient loss reductions are primarily due to lower ammonia- N volatilization and in some cases N and P losses with surface runoff. Nutrient loss reductions vary with timing between application and soil mixing, degree of soil mixing, and percent soil disturbance. Incorporation methods alone are not expected to reduce sediment losses.

[1]Including manures, biosolids, or composed materials

[2] To be determined

Proposed BMP Definition (cont.)

- **High disturbance incorporation** methods provide the highest degree of mixing of organic nutrient sources into the root zone, but the benefits of conservation tillage are eliminated.
- **Low disturbance incorporation** methods may leave greater quantities of organic nutrient sources on the soil surface, but are compatible with conservation tillage programs.

Proposed BMP Definition (cont.)

- **Injection** is a specialized category of placement in which organic nutrient sources are mechanically applied into the root zone with surface soil closure at the time of application. Injection is expected to provide the greatest level of nutrient loss reduction, due to limited quantities of material left on soil surface, limited soil disruption, and immediate soil closure.

Considerations

- N and P considered separately, no sediment reduction considered
- For N, reduced ammonia-N volatilization and reduced application rates primary benefit
- For P, reduced losses with runoff primary benefit
- Three categories
  1. High disturbance incorporation
  2. Low disturbance incorporation
  3. Injection
- Criteria for low disturbance incorporation will be coordinated with the Conservation Tillage Panel
- Likely no P reduction with high disturbance incorporation due to high losses of sediment bound P

Considerations

- Will consider different efficiencies by region, at least coastal plain vs. upland regions
- Model may not have capacity to handle different manure types, so different values for the different regions may handle liquid manure vs. poultry litter differences
- Non-nutrient benefits, like odor reduction, will be reported but not considered in estimating BMP efficiency