Phase 6 Manure Injection & Incorporation Expert Panel

Name	Affiliation	Role
Curt Dell	USDA-Agriculture Research Service	Panel Chair
Art Allen	University of Maryland – Eastern Shore	Panel Member
Dan Dostie	USDA-Natural Resources Conservation Service	Panel Member
Robb Meinen	Penn State University	Panel Member
Rory Maguire	Virginia Tech	Panel Member
Chris Brosch	Delaware Department of Agriculture	Watershed Technical Workgroup representative
Jeff Sweeney	CBPO	Modeling Team representative

Practice Names

- Manure Injection
- Manure Incorporation High Disturbance
- Manure Incorporation Low Disturbance

Definition of the Practice

- **Manure injection** is a specialized category of placement in which organic nutrient sources (including manures, biosolids, and composted materials) 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 from both atmospheric and surface runoff pathways, as well as odor reduction, due to limited quantities of material left on the soil surface, limited soil disruption, and immediate soil closure.

Definition of the Practice

- **Manure incorporation** is defined as the mixing of dry, semi-dry, or liquid organic nutrient sources (including manures, biosolids, and compost) into the soil profile within some specified time period from application by a range of field operations. These methods can provide nutrient loss reductions which may differ for P and N by method used. Nutrient loss reductions are primarily due to lower ammonia-N volatilization and in some cases lower P losses in surface runoff. Nutrient loss reductions may vary with timing between application and soil mixing, degree of soil mixing, and percent soil disturbance. The Panel is considering two general types of incorporation:
- **High disturbance incorporation**, providing the highest degree of mixing of organic nutrient sources into the root zone, but eliminating the erosion control benefits of conservation tillage; and
- **Low disturbance incorporation**, leaving greater quantities of organic nutrient sources on the soil surface, but maintaining most of the benefits of conservation tillage.

QUALIFYING PRACTICE CONDITIONS

- Identification of appropriate manure application technologies;
- Compatibility with the NRCS definitions of manure injection and incorporation and how the recommended practice(s) will impact residue management and soil disturbance, as defined by either NRCS or the states.
- Potential effects of the recommended practice(s) on sediment losses with regard to assigning reduction efficiencies for incorporation. As erosion potential increases, incorporation will increase the potential for sediment and sediment-bound nutrient losses, which will offset reductions in dissolved nutrient losses; and
- Permissible elapsed time between initial manure application and incorporation

Progress

- Gotten bogged down with completion of the literature review. CBP has offered assistance through VT agreement, we but haven't yet a identified person that can do the work.
- Hoping to complete lit review by end of May and finalize report by mid-summer