

Charge and Scope of Work

Manure Injection and Incorporation Phase 6.0 Expert Panel

March 19, 2015

Background

In the current version of the Chesapeake Bay Program (CBP) Partnership's Watershed Model (version 5.3.2), manure injection is recognized as an interim practice used for planning purposes only. Manure injection incorporates multiple application methods for the subsurface upper soil horizon placement of solid, semi-solid, or liquid livestock manures. These methods are used to reduce organic nutrient losses to the environment from both atmospheric and surface runoff pathways, as well as reduce odor concerns. Injection application methods may also minimize soil surface crop residue losses over incorporation application methods. The placeholder effectiveness values are 25% TN, 0% TP and 0% TSS. Effectiveness values were based on a conservative estimate informed by university and USDA-ARS research from the Beltsville Agricultural Research Center.

The practice of manure incorporation is not currently recognized in the Phase 5.3.2 Model as an existing or interim BMP. Manure incorporation involves multiple application methods for the mixing of solid, semi-solid or liquid livestock manures in the upper soil horizon and available crop residues. These methods are used to reduce organic nutrient losses to the environment from both atmospheric and surface runoff pathways, as well reduce odor concerns. Incorporation application methods may also substantially reduce soil surface crop residues over injection methods. Due to recent increased implementation of this practice by recommendation of several state nutrient management programs, the Agriculture Workgroup has requested a review for the Phase 6.0 Model.

Recommendations for Expert Panel Member Expertise

The AgWG expert panel organization process¹ directs that each expert panel is to include eight members, including one non-voting representative each from the Watershed Technical Workgroup (WTWG) and Chesapeake Bay Program modeling team. Panels are also expected to include three recognized topic experts and three individuals with expertise in environmental and water quality-related issues. A representative of USDA who is familiar with the USDA-Natural Resources Conservation Service (NRCS) conservation practice standards should be included as one of the six individuals who have topic- or other expertise. Panelists' areas of expertise may overlap.

In accordance with the July 13, 2015 Water Quality Goal Implementation Team BMP Expert Panel Protocol (BMP Protocol)², panel members should not represent entities with potential conflicts of interest, such as entities that could receive a financial benefit from Panel

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http://www.chesapeakebay.net/channel_files/22312/january_9_2015_agwg_expert_panel_organization_process.pdf

² http://www.chesapeakebay.net/documents/CBP_BMP_Expert_Panel_Protocol_WQGIT_approved_7.13.15.pdf

recommendations or where there is a conflict between the private interests and the official responsibilities of those entities. All Panelists are required to identify any potential financial or other conflicts of interest prior to serving on the Panel. These conditions will minimize the risk that Expert Panels are biased toward particular interests or regions.

The Agriculture Workgroup directs that the P6.0 Manure Injection and Incorporation Panel should include members with the following areas of expertise:

- Manure injection and incorporation technologies for both liquid and dry manures and their practical application.
- Nutrient and sediment transport (via air and water) associated with the application of manure injection and incorporation technologies.
- Various physiographic regions of the Chesapeake Bay and their relationship to nutrient and sediment transport.
- How BMPs are tracked and reported, and the Chesapeake Bay Program partnership's modeling tools.
- Knowledge of and experience with NRCS practice standards and codes.

The collective expertise of panel members should cover the range of the physiographic regions found and the agricultural crops produced within the Chesapeake Bay watershed.

Expert Panel Scope of Work

The general scope of work for the Manure Injection and Incorporation P6.0 Panel will be to define and configure the Manure Injection and Incorporation BMPs in the P6.0 model. Specifically, the Panel will develop definitions, and loading or effectiveness estimates for manure injection and manure incorporation practices.

1. Identification and definition of appropriate manure injection and incorporation technology categories for liquid, solid and semi-solid manures.
2. Evaluation of nutrient and sediment transport (via air and water) associated with the application of manure injection and incorporation technology categories for relevant effectiveness estimates.
3. Consider potential variations of technology applications and effectiveness estimates associated with the physiographic regions and cropping systems of the Chesapeake Bay, and their relationship to nutrient and sediment transport.

In defining the practice(s), the Panel shall consider the following issues (among others):

- 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. For example, the NRCS Practice Standard 345 for reduced till requires that no full-width tillage occurs during the time interval starting with harvest or termination of the previous crop until harvest or termination of the reduced-till crop, regardless of the depth of the tillage operation. The only soil disturbance during this time interval is tillage in strips and slots. Tilled strips or slots are no wider than one third of the row width. Furthermore, the potential for incorporation to influence the efficiency of previously applied BMPs during a given year (e.g., practices designed to promote high-residue/minimum soil disturbance) should be considered;

- The effect 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
- The permissible elapsed time between initial manure application and incorporation.

The Panel will follow the process described in the 2015 BMP Protocol for all activities including development of a final report. In addition, the Panel will develop a provisional paper including BMP structure and type, draft BMP definition(s), and initial elements of the BMP such as associated components and conservation practices, and USDA-NRCS associated conservation practice codes. Initially identified literature citations will be included to provide a range of potential effectiveness values that the panel will consider and supplement with further evaluation. The panel will present their provisional BMP paper to the AgWG, WTWG, and WQGIT for informational purposes, and for initial Partnership comments on the proposed direction of the panel's evaluation. Provisional panel recommendations will be used only for initial Phase 6 model development and calibration, and not for future implementation progress reporting by the jurisdictions.

Timeline/Deliverables

The Expert Panel project timeline for the development of the panel recommendations is based on the Phase 6.0 model development schedule. This timeline includes the development of a provisional recommendation for this BMP prior to the finalization of a fully documented recommendation report with effectiveness values. Provisional panel recommendations will be used only for initial Phase 6 model development and calibration, and not for future implementation progress reporting by the jurisdictions. The Panel coordinator will work with the Panel to develop a detailed project timeline based on the deadlines below.

Summer 2015 – Panel stakeholder kickoff meeting

September/October 2015 – The Panel will present a provisional report to the AgWG, WTWG, and WQGIT for informational purposes, and for initial Partnership comments on the proposed direction of the Panel's evaluation. The paper will not represent a full recommendation report, and the Partnership will not be asked for formal approval at this time.

February 2016 – Target date for Panel to release draft report to the Partnership.

April 11, 2016 – Target date for full Partnership approval of the panel report.

Phase 6.0 BMP Verification Recommendations

The panel will utilize the Partnership approved *Agricultural BMP Verification Guidance*³, as the basis for developing BMP verification guidance recommendations that are specific to the BMP(s) being evaluated. The panel's verification guidance will provide relevant supplemental details and specific examples to provide the Partnership with the recommended

³ <http://www.chesapeakebay.net/documents/Appendix%20B%20-Ag%20BMP%20Verification%20Guidance%20Final.pdf>

potential options for how jurisdictions and partners can verify recommended manure injection and incorporation practices in accordance with the Partnership's approved guidance.