Recommendations for the Cover Crops Phase 6.0 Expert Panel

Prepared for the Chesapeake Bay Program Partnership's Agriculture Workgroup by the Cover Crops Expert Panel Establishment Group
March 19, 2015

Background

Traditional and commodity cover crops are approved practices in the Phase 5.3.2 (P5.3.2) Chesapeake Bay Program Watershed Model. The Traditional Cover Crops BMP is currently defined as a short term crop grown after the main cropping season to reduce nutrient losses to ground and surface water by sequestering excess nutrients. No additional nutrients are applied in either the fall or spring, and the cover crop is terminated without harvesting. The following traditional cover crop species have associated nitrogen (N), phosphorus (P), and sediment reduction efficiencies:

- Rye
- Wheat
- Barley
- Annual Ryegrass
- Annual Legumes
- Annual Legume plus Grass Mixtures
- Brassica (winter hardy)
- Forage Radish
- Forage Radish plus Grass Mixtures
- Triticale
- Oats (winter hardy)
- Oats (winter killed)

The Commodity Cover Crops BMP is currently defined as a short term crop grown after the main cropping season to reduce nutrient losses to ground and surface water by sequestering excess nutrients. No additional nutrients are applied in the fall, however additional nutrients can be applied in the spring after March 1 and the commodity cover crop can be harvested. The following commodity cover crops have an associated N reduction efficiency:

- Rye
- Wheat
- Barley

The Cover Crops Expert Panel Establishment Group (EPEG) was formed to:

- Identify priority tasks for the first Phase 6.0 (P6.0) Cover Crops Expert Panel (EP),
- Recommend areas of expertise that should be included on the Cover Crops EP, and
- Draft the Cover Crops EP's charge for the review process.

From February 13, 2015 through March 6, 2015 the EPEG met 3 times by conference call and worked collaboratively to complete this charge for presentation to the Agriculture Workgroup

(AgWG) on March 18-19, 2015. Final approval of the charge was obtained by online polling of all members. Members of the EPEG are listed in Table 1.

Table 1. Cover Crops Expert Panel Establishment Group membership and affiliations.

Member	Affiliation
Don McNutt	Center for Dairy Excellence
Erika Larsen	U.S. Environmental Protection Agency
Jack Meisinger	U.S. Department of Agriculture-Agricultural Research Service
Jason Keppler	Maryland Department of Agriculture
Wade Thomason	Virginia Tech
EPEG Support Staff	
Emma Giese	Chesapeake Research Consortium
Mark Dubin	University of Maryland
Steve Dressing	Tetra Tech, Inc.

Method

The Cover Crops EPEG developed its recommendations in accordance with the process specified by the AgWG (AgWG 2014). This process is informed by the strawman proposal presented at the December 11, 2014 AgWG meeting, the Water Quality Goal Implementation Team (WQGIT) Best Management Practice (BMP) protocol, input from existing panelists and chairs, and the process recently undertaken by the AgWG to develop the charge for the Manure Treatment Technologies EP.

The collective knowledge and expertise of EPEG members formed the basis for the recommendations contained herein. A number of EPEG members have had experience on BMP expert panels, including the P5.3.2 Cover Crops EP. Other EPEG members have knowledge and/or expertise in state and federal programs, the Chesapeake Bay model, and cover crop practices within the Chesapeake Bay watershed.

Communication among EPEG members was by conference call and email. All decisions were consensus-based.

Recommendations for Expert Panel Member Expertise

The AgWG expert panel organization process 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.

In accordance with the WQGIT BMP protocol, panel members should not represent entities with potential conflicts of interest, such as entities that could receive a financial benefit from Panel

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 Cover Crops EPEG recommends that the P6.0 Cover Crops EP should include members with the following areas of expertise:

- An agronomist or soil scientist with experience with cover crops in the Chesapeake Bay watershed.
- Knowledge of how BMPs are tracked and reported, and the Chesapeake Bay Program partnership's modeling tools.
- Experience verifying cover crop practice implementation.
- Expertise in fate and transport of N, P, or sediment in cover cropped systems.
- Expertise in hydrology to address both surface water and ground water transport.
- Expertise in both grain and forage crops and operations with and without livestock.
- Knowledge of, and experience with, USDA-NRCS conservation practice standards and codes.

The collective expertise of panel members should cover the range of both the physiographic regions found and the cover crop species used within the Chesapeake Bay watershed.

Expert Panel Scope of Work

The general scope of work for the Cover Crops P6.0 EP will be to define and configure the Cover Crops BMP in the P6.0 model. Specifically, the Cover Crops EPEG recommends the following two charges with associated tasks for the P6.0 Cover Crops EP:

1. Transition and translate all current cover crop reduction efficiencies from the P5.3.2 to the P6.0 model.
2. Review and update the definitions and reduction efficiencies of cover crops that are eligible for commodity cover crop status.
3. Panel will collaborate with the P6.0 conservation tillage EP to address credits for winter cover crops that receive fall nutrients.

The following two items are recommended for consideration if time allows, or if necessary within the context of addressing charges 1 and 2:

- Create a late-summer planting system for cover crops that are planted in mid- to late-August after a silage removal or short-season crop (e.g., vegetable).
- Consider a change from the current approach that uses average frost date for setting planting dates to one that uses heat units.

This scope of work addresses cover crop reduction efficiencies for N, P, and sediment.

The first charge is necessary because the P6.0 model features a change in land use categories, a possible change in the baseline condition, and some likely changes in how the cover crop BMPs will be applied to specific land uses.

The second charge is necessary to evaluate and update the commodity cover crop portion of the BMP that was not addressed by the Phase 5.3.2 Cover Crops Expert Panel. This evaluation and updating should include an evaluation of the current N reduction efficiencies and possible estimates of P and sediment reduction efficiencies for the existing commodity cover crops, identifying other cover crop species from the current traditional cover crop list that would be eligible for commodity cover crop status, and estimating the N, P, and sediment reduction efficiencies for each new commodity cover crop species.

The third charge is necessary to ensure that recommendations regarding a definition and credits for winter cover crops receiving fall nutrients are based on input from both EPs. The P6.0 conservation tillage EP is charged with this task, but collaboration with this Panel is recommended to both ensure consistency between and take advantage of the expertise available in the two panels.

While the P6.0 EP panel is charged only with items 1 through 3 and their associated tasks, it may choose to address the two additional items, if it has time or it is determined that addressing either or both of these items is essential to the successful completion of charges 1 and 2.

The first optional item is suggested to expand the scope of the cover crop BMP to address those covers planted after a summer-harvested crop. Such planting is much earlier than the frost date that is currently in use. In addition, some cover crops will be better suited for early planting (e.g., radishes, warm season grasses) while others will not (e.g., rye, cool season grasses). If the first optional item is undertaken, it will also require estimating the N, P, and sediment reduction efficiencies for each species in the new late-summer planting category. The second optional item is suggested because cover crop planting dates in the P5.3.2 model are based on average frost date, in order to adjust the reduction efficiencies across the whole Bay Watershed. The second optional item recommends that the P6.0 EP consider the usefulness and practicality of using a heat unit based planting date system. It is recognized that a heat-unit approach would require significant additional data-base work, but the benefits may warrant such effort.

Timeline and Deliverables

Early summer 2015 - Panel stakeholder kickoff meeting

Summer 2015 – Based on their written EPEG charge, the panel will develop a proposed scope of work 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 CP 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. The paper will not represent a full recommendation report, and the partnership will not be asked for formal approval at this time.

Prior to October 1, 2015 – In the absence of a Partnership approved panel recommendation report, the CBPO modeling team will request a decision by the Agriculture Workgroup, Watershed Technical Workgroup, and the Water Quality Goal Implementation Team of whether the BMP will be represented using the existing Phase 5.3.2 definitions or the Phase 6.0 panel's provisional paper in the Phase 6 Beta Scenario Builder tool to meet an early October deadline.

Spring 2016 – **Final date** for panel to release full recommendations for approval by the AgWG, WTWG, and WQGIT.

Early summer 2016 – If approved by the partnership, panel recommendations are final and will replace the interim representation of the BMP in the final version of the Phase 6 modeling tools.

Phase 6.0 BMP Verification Recommendations:

The panel will utilize the Partnership approved ***Agricultural BMP Verification Guidance***[1], 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 recommended potential options for how jurisdictions and partners can verify cover crops practices in accordance with the Partnership's approved guidance.

References

AgWG. 2014. Agriculture Workgroup expert panel organization – DRAFT January 8, 2014. Agriculture Workgroup, Chesapeake Bay Program.

[1] http://www.chesapeakebay.net/documents/Appendix%20B%20-Ag%20BMP%20Verification%20Guidance%20Final.pdf

Attachment 1: Outline for Final Expert Panel Reports

- Identity and expertise of Panel members
- Practice name/title
- Detailed definition of the practice
- Recommended nitrogen, phosphorus, and sediment loading or effectiveness estimates
  - Discussion may include alternative modeling approaches if appropriate
- Justification for the selected effectiveness estimates, including
  - List of references used (peer-reviewed, unpublished, etc.)
  - Detailed discussion of how each reference was considered, or if another source was investigated, but not considered.
- Description of how best professional judgment was used, if applicable
- Land uses to which the BMP is applied
- Load sources that the BMP will address and potential interactions with other practices
- Description of pre-BMP and post-BMP circumstances, including the baseline conditions for individual practices
- Conditions under which the BMP works:
  - Should include conditions where the BMP will not work, or will be less effective. An example is large storms that overwhelm the design.
  - Any variations in BMP effectiveness across the watershed due to climate, hydrogeomorphic region, or other measureable factors.
- Temporal performance of the BMP including lag times between establishment and full functioning (if applicable)
- Unit of measure (e.g., feet, acres)
- Locations within the Chesapeake Bay watershed where this practice is applicable
- Useful life; effectiveness of practice over time
- Cumulative or annual practice
- Description of how the BMP will be tracked, reported, and verified:
  - Include a clear indication that this BMP will be used and reported by jurisdictions
- Suggestion for a review timeline; when will additional information be available that may warrant a re-evaluation of the estimate
- Outstanding issues that need to be resolved in the future and a list of ongoing studies, if any
- Documentation of any dissenting opinion(s) if consensus cannot be reached
- Operation and Maintenance requirements and how neglect alters performance

Additional Guidelines

- Identify ancillary benefits and unintended consequences
- Include negative results
  - Where studies with negative pollution reduction data are found (i.e. the BMP acted as a source of pollutants), they should be considered the same as all other data.

- Include results where the practice relocated pollutants to a different location. An example is where a practice eliminates a pollutant from surface transport but moves the pollutant into groundwater.

In addition, the Expert Panel will follow the "data applicability" guidelines outlined Table 1 of the Water Quality Goal Implementation Team's *Protocol for the Development, Review, and Approval of Loading and Effectiveness Estimates for Nutrient and Sediment Controls in the Chesapeake Bay Watershed Model*: