

## Attachment B

### Technical Requirements for Entering the Cover Crops BMPs into Scenario Builder and the Watershed Model

Background: In June, 2013 the Water Quality Goal Implementation Team (WQGIT) agreed that each BMP expert panel would work with CBPO staff and the Watershed Technical Workgroup (WTWG) to develop a technical appendix for each expert report. The purpose of the technical appendix is to describe how the expert panel's recommendations will be integrated into the modeling tools including NEIEN, Scenario Builder and the Watershed Model.

***Q1: What are the efficiency reductions a jurisdiction can claim for implementing and reporting the new cover crop species?***

A1: The table below shows the reduction efficiencies for nitrogen, phosphorus, and sediment for each of the new cover crop species.

**Table 1: Reduction Benefits for New Cover Crop Species**

Species	BMP Short Name	Nitrogen, high and low till		Phosphorus, all regions, high till <sup>1</sup>	Sediment, all regions, high till <sup>1</sup>
		Mesozoic Lowlands/ Valley and Ridge Siliciclastic	Coastal Plain/ Piedmont Crystalline/ Karst Settings		
Forage Radish, Early, Drilled	CoverCropEDFR	20	26	6	9
Forage Radish, Early, Other	CoverCropEOFR	17	22	6	9
Forage Radish, Early, Aerial, After Soy	CoverCropEASFR	14	18	6	9
Forage Radish, Early, Aerial	CoverCropEAFR	8	10	6	9
Forage Radish + Grass , Early, Drilled	CoverCropEDFRG	22	29	8	12
Forage Radish + Grass, Early, Other	CoverCropEOFRG	19	25	8	12
Forage Radish + Grass, Early, Aerial, After Soy	CoverCropEASFRG	15	20	8	12

Forage Radish + Grass, Early, Aerial	CoverCropEAFRG	9	12	8	12
Forage Radish + Grass, Normal, Drilled	CoverCropSDFRG	16	22	4	6
Forage Radish + Grass, Normal, Other	CoverCropSOFRG	14	18	4	6
Annual Legume, Early, Drilled	CoverCropEDL	5	7	6	8
Annual Legume, Early, Other	CoverCropEOL	5	6	6	8
Annual Legume, Early, Aerial, After Soy	CoverCropEASL	4	5	6	8
Annual Legume, Early, Aerial	CoverCropEAL	2	3	6	8
Annual Legume, Normal, Drilled	CoverCropSDL	5	6	3	4
Annual Legume, Normal, Other	CoverCropSOL	4	6	3	4
Annual Legume + Grass, Early, Drilled	CoverCropEDLG	15	20	10	15
Annual Legume + Grass, Early, Other	CoverCropEOLG	13	17	10	15
Annual Legume + Grass, Early, Aerial, After Soy	CoverCropEALSG	10	14	10	15
Annual Legume + Grass, Early, Aerial	CoverCropEALG	6	8	10	15
Annual Legume + Grass, Normal, Drilled	CoverCropSDLG	14	19	5	7
Annual Legume + Grass, Normal, Other	CoverCropSOLG	12	16	5	7
Triticale, Early, Drilled	CoverCropEDT	29	39	12	17
Triticale, Early, Other	CoverCropEOT	25	33	12	17
Triticale, Early, Aerial, After Soy	CoverCropEAST	21	27	12	17
Triticale, Early, Aerial	CoverCropEAT	12	15	12	17

Triticale, Normal, Drilled	CoverCropSDT	27	35	6	8
Triticale, Normal, Other	CoverCropSOT	23	30	6	8
Triticale, Late, Drilled	CoverCropLDT	13	16	0	0
Triticale, Late, Other	CoverCropLOT	10	14	0	0
Annual Ryegrass, Early, Drilled	CoverCropEDAR	22	30	10	15
Annual Ryegrass, Early, Other	CoverCropEOAR	19	25	10	15
Annual Ryegrass, Early, Aerial, After Soy	CoverCropEASAR	16	20	10	15
Annual Ryegrass, Early, Aerial	CoverCropEAAR	9	12	10	15
Annual Ryegrass, Normal, Drilled	CoverCropSDAR	20	27	5	7
Annual Ryegrass, Normal, Other	CoverCropSOAR	18	23	5	7
Winter Hardy Oats, Early, Drilled	CoverCropEDHO	19	25	9	14
Winter Hardy Oats, Early, Other	CoverCropEOHO	16	21	9	14
Winter Hardy Oats, Early, Aerial, After Soy	CoverCropEASHO	13	17	9	14
Winter Hardy Oats, Early, Aerial	CoverCropEAHO	8	10	9	14
Winter Hardy Oats, Normal, Drilled	CoverCropSDHO	17	23	4	7
Winter Hardy Oats, Normal, Other	CoverCropSOHO	15	19	4	7
Winter Killed Oats, Early, Drilled	CoverCropEDKO	14	18	6	8
Winter Killed Oats, Early, Other	CoverCropEOKO	12	15	6	8
Winter Killed Oats, Early, Aerial, After Soy	CoverCropEASKO	10	13	6	8
Winter Killed Oats,	CoverCropEAKO	6	7	6	8

Early, Aerial					
Winter Hardy Brassica, Early, Drilled	CoverCropEDHB	24	32	10	13
Winter Hardy Brassica, Early, Other	CoverCropEOHB	20	27	10	13
Winter Hardy Brassica, Early, Aerial, After Soy	CoverCropEASHB	17	22	10	13
Winter Hardy Brassica, Early, Aerial	CoverCropEAHB	10	13	10	13

<sup>1</sup> Phosphorus and sediment reductions are only applicable to high till land uses; the phosphorus and sediment reduction for cover crops on low till land uses is 0.

***Q2: How is the reduction actually calculated in Scenario Builder and the Watershed Model?***

A2: The total load reduction is determined by the Watershed Model as the product of the efficiency reduction listed in Table 1, the acres of agricultural land within the model segment with cover crops reported, and the total nitrogen, phosphorus, and sediment loads simulated for the model segment for those agricultural acres.

***Q3: Did the panel alter the way existing cover crop species receive credit?***

A3: No. The expert panel recommended that the current cover crop species be simulated in the same way they have historically been simulated using the Phase 5.3.2 Watershed Model

***Q4: What does a jurisdiction need to report in order to receive credit for cover crop species in Progress?***

A4: Jurisdictions should report the following information:

- Cover Crop Type: Species of cover crop
- Planting Method\*: Aerial, Drilled, Other
- Planting Time Period\*: Early, Standard, Late
- Crop preceding Cover Crop\*: Corn, Soybean
- Land Use: Approved NEIEN Row Crop Land Uses
- Acres: Number of acres with reported species within geographic reporting unit
- Location: Approved NEIEN geographies: County; County (CBWS Only); Hydrologic Unit Code (HUC12, HUC10, HUC8, HUC6, HUC4), State (CBWS Only)
- Date of Implementation: Year cover crop was planted

\*These are preferred, but are not required. See Question 6 for a more detailed description of defaults if data is not provided.

***Q5: What does a jurisdiction need to report in order to receive credit for cover crop species in a planning scenario?***

A5: Jurisdictions should report the following information:

- BMP Short Name: See Table 1 for short names
- Acres: Number of acres planted
- Location: Approved geographies: County; County (CBWS Only); Hydrologic Unit Code (HUC12, HUC10, HUC8, HUC6, HUC4); State; State (CBWS Only)
- Land Use: Approved SB Row Crop Land Uses
- Year: Year of planting

***Q6: Can a jurisdiction still receive credit if it cannot report the planting method, planting time, or preceding crop?***

A6: Yes. Jurisdictions should always report the most specific information available to them for cover crop implementation. Data reported for CBP purposes should preferably include all elements listed in Question 5.

If any of this information is not reported, the default conditions for the unreported category will be the lowest nitrogen reduction benefit for that category in the approved expert panel report. If relevant, the phosphorus and sediment benefit associated with this model nitrogen reduction will also apply. If the lowest reduction benefit for the missing category is “0” or “NA,” then “0” is used for model credit.

For example, if a jurisdiction reports “Forage Radish” as a Cover Crop species, they will receive a 10% reduction in N, 0% reduction in P, and 0% reduction in sediment which corresponds to the lowest reductions available in the “Forage Radish” category.