Appendix B: Conservation Practices with Soil Health Benefits, SHAC Priorities

Full Practice List Under Initial Consideration (March 2020)

Landscape Setting	Conservation Practice Name	Practice Code	Practice Definition	NRCS Resource Concern			Carbon	Water Quality		Soil Health Outcome Quadrant
				Soil Quality - Organic Matter Depletion	Soil Quality - Compaction	Soil Erosion - Sheet & Rill	MtCO2e/ ac/yr estimate	WIP goal	MACS eligible	
C	Alley Cropping	311	Trees or shrubs planted in a set or series of single or multiple rows with agronomic, horticultural crops or forages produced in the alleys between the rows of woody plants.	5	2	5	1.74			4
C	Amending Soil Properties with Gypsum Products	333	Using gypsum- (calcium sulfate dihydrate) derived products to change the physical and/or chemical properties of soil.	1	0	1				1
C	Conservation Crop Rotation	328	Growing crops in a planned sequence on the same field.	4	1	4	0.22			4
C	Contour Buffer Strips	332	Narrow strips of permanent, herbaceous vegetative cover established around the hill slope, and alternated down the slope with wider cropped strips that are farmed on the contour.	2	0	3	1.26	X		4
C	Contour Farming	330	Using ridges and furrows formed by tillage, planting and other farming operations to change the direction of runoff from directly downslope to around the hillslope.	1	0	2		X	X	2
C	Contour Orchard and Other Perennial Crops	331	Planting orchards, vineyards, or other perennial crops so that all cultural operations are done on or near the contour.	2	0	4	-	X	X	2
C	Cover Crop	340	Crops including grasses, legumes, and forbs for seasonal cover and other conservation purposes.	2	2	4	0.37	X	X	4
C	Drainage Water Management	554	The process of managing water discharges from surface and/or subsurface agricultural drainage systems	2	-1	0		X	X	not applicable
C	Integrated Pest Management	595	A site-specific combination of pest prevention, pest avoidance, pest monitoring, and pest suppression strategies.	2	2	2				4
C	Irrigation Water Management	449	Irrigation water management is the process of determining and controlling the volume, frequency, and application rate of irrigation water in a planned, efficient manner.	1	0	0		*		not applicable
C	Nutrient Management	590	Managing the amount (rate), source, placement (method of application), and timing of plant nutrients and soil amendments.	2	-1	0	0.11-1.75	X		1
C	Residue and Tillage Management, No Till	329	Managing the amount, orientation and distribution of crop and other plant residue on the soil surface year round, limiting soil-disturbing activities to those necessary to place nutrients, condition residue and plant crops.	2	2	4	0.31	X		2
C	Residue and Tillage Management, Reduced Till	345	Managing the amount, orientation and distribution of crop and other plant residue on the soil surface year round while limiting the soil-disturbing activities used to grow and harvest crops in systems where the field surface is tilled prior to planting.	2	1	4	0.2	X		2

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C	Stripcropping	585	Growing planned rotations of row crops, forages, small grains, or fallow in a systematic arrangement of equal width strips across a field.	2	0	4		X	X	4
C/P	Hedgerow Planting	422	Establishment of dense vegetation in a linear design to achieve a natural resource conservation purpose.	2	1	0	1.7	X		4
C/P	Mulching	484	Applying plant residues or other suitable materials produced off site, to the land surface	1	0	4	0.32			2
C/P	Waste Recycling	633	The use of the by-products of agricultural production or the agricultural use of non-agricultural by-products.	1	0	0				1
C/P	Windbreak/Shelterbelt Establishment	380	Windbreaks or shelterbelts are single or multiple rows of trees or shrubs in linear configurations.	4	2	1		X		4
LC	Conservation Cover	327	Establishing and maintaining permanent vegetative cover	5	3	4	1.26	X	X	4
LC	Critical Area Planting	342	Establishing permanent vegetation on sites that have, or are expected to have, high erosion rates, and on sites that have physical, chemical or biological conditions that prevent the establishment of vegetation with normal practices.	5	2	5	1.26	X	X	4
LC	Field Border	386	A stripe of permanent vegetation established at the edge or around the perimeter or a field.	4	2	4	1.26	X	X	4
LC	Filter Strip	393	A strip or area of herbaceous vegetation that removes contaminants from overland flow.	5	0	0	1.26	X	X	4
LC	Grassed Waterway	412	A shaped or graded channel that is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet.	3	0	0	1.26	X	X	4
LC	Riparian Forest Buffer	391	An area predominantly trees and/or shrubs located adjacent to and up-gradient from watercourses or water bodies.	4	2	3	2.47	X	X	4
LC	Riparian Herbaceous Cover	390	Grasses, sedges, rushes, ferns, legumes, and forbs tolerant of intermittent flooding or saturated soils, established or managed as the dominant vegetation in the transitional zone between upland and aquatic habitats.	4	4	2	1.26	X	X	4
LC	Shallow Water Development and Management	646	The inundation of lands to provide habitat for fish and/or wildlife.	1	0	0		X		4
LC	Tree/Shrub Establishment	612	Establishing woody plants by planting seedlings or cuttings, direct seeding, or natural regeneration.	4	2	5	2.26	X		4

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LC	Vegetated Treatment Area	635	An area of permanent vegetation used for agricultural wastewater treatment.	3	3	4		X	X	4
LC	Vegetative Barrier	601	Permanent strips of stiff, dense vegetation established along the general c	0	0	4	1.26	X		4
LC	Wetland Creation	658	The creation of a wetland on a site location that was historically non-wetland.	2	0	0		X	X	4
LC	Wetland Enhancement	659	The augmentation of wetland functions beyond the original natural conditions on a former, degraded, or naturally functioning wetland site; sometimes at the expense of other functions.	1	0	0		X		4
LC	Wetland Restoration	657	The return of a wetland and its functions to a close approximation of its original condition as it existed prior to disturbance on a former or degraded wetland site.	1	0	0		X	X	4
P	Forage and Biomass Planting	512	Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay, or biomass production.	1	2	1	0.22	X	X	4
P	Forage Harvest Management	511	The timely cutting and removal or forages from the field as hay, green-chop, or ensilage.	1	3	1				4
P	Prescribed Grazing	528	Managing the harvest of vegetation with grazing and/or browsing animals.	4	2	4	0.26	X		4
P	Silvopasture Establishment	381	An application establishing a combination of trees or shrubs and compatible forages on the same acreage.	3	0	4	1.34			4

LEGEND

C = Cropland - Infield practice or management practice
P = Pasture - Infield practice or management practice
LC = Land Conversion - conversion of working lands to permanent cover (woody, herbaceous, or wetland). Practices vary in landscape position (i.e. Infield vs. edge-of-field).

* = Interim practice under review

Survey Results Summary, 2020

	All Responses	Producers	Ag Orgs	Agency Reps	Academia	Non-Profits	Anon
Ally Cropping					■		■
Properties with Gypsum Products							
Conservation Crop Rotation	■	■	■	■	■	■	
Contour Buffer Strips				■	■		■
Contour Farming					■		
Contour Orchard and Other Perennial Crops					■		
Cover Crop	■	■	■	■	■	■	■
Drainage Water Management		■					
Integrated Pest Management		■			■		
Irrigation Water Management		■	■		■		
Nutrient Management	■	■	■	■	■		■
Residue and Tillage, No Till	■	■	■	■	■	■	■
Residue and Tillage, Reduced Till	■		■	■	■		
Stripcropping					■		
Hedgerow Planting					■		■
Mulching							
Waste Recycling		■			■		
Windbreak/Shelterbelt Establishment					■		
Conservation Cover		■	■	■	■		
Critical Area Planting		■	■	■	■		
Field Border				■	■		■

	All Responses	Producers	Ag Orgs	Agency Reps	Academia	Non-Profits	Anon
Filter Strip		■					■
Grassed Waterway		■			■		■
Riparian Forest Buffer	■			■	■		■
Riparian Herbacaous Cover			■	■	■		
Shallow Water Development and Management							
Tree/Shrub Establishment			■	■	■		
Vegetated Treatment Area							
Vegetative Barrier			■		■		
Wetland Creation							
Wetland Enhancement							
Wetland Restoration							
Forage and Biomass Planting	■	■	■	■	■	■	■
Forage Harvest Management		■			■		■
Prescribed Grazing	■	■	■	■	■	■	■
Silvopasture Establishment					■	■	■

Survey Results: Written Comments

Thomas Croghan: See March 10 email. In addition, we may want to think about the boundaries of our project. Many of the practices in the survey would be implemented on field borders and landscapes, and thus might not be considered directly related to soil health on harvested cropland. I personally prefer the broader view, but the committee should discuss and reach consensus on the limits. The benefits of these practices depend on how they are implemented, especially with regard to the degree of diversity.

Steven Darcey: To get the greatest bang for the buck, we need to focus on bmps that treat large areas. However, if we bundle bmps we can address smaller operations as well as large operations.

Matt Fry: Work groups should be established based on relative scope of operations

Michael Calkins: Capitalize on the MACS program. It's already set up for funding cost share.

Colby Ferguson: I think getting a better assessment on the water quality improvement value as well as an air quality improvement value for each BMP will assist in determining what funding pot each BMP assistance should be funded from.

Amy Jacobs: I suggest clearly defining the goal(s) of increasing these practices and then using the science to prioritize which are meeting these goals best. This feels very subjective to which practices I think are best for a variety of reasons.

Lindsay Thompson: We need to be particularly mindful of funding sources and meeting the purpose of those sources with the funded practices. Additionally, one size does not fit all. There may be a need for different programs and definitely different practices for different producers.

Mike Twining: We should be targeting practices that affect the highest number of acres the fastest. This will do more to ensure more rapid long-term adoption of practices that build soil health. Many of the items on the above list are nutrient loss mitigation strategies that do not correlate well in my opinion to building soil health.

Christopher Beck: Maryland has been a proven leader on progressive, climate-friendly agricultural practices, but these programs have a cost. It's time to consider alternative sources of funding including the general agency budget.

Christy Brown: I think that the priority of soil health practices will vary depending on the soil health goal that is trying to be achieved.

David Smith: As said in an email sent to Alisha on March 18, we should consider stratifying program guidelines according to the type of ag system (e.g., cropland practices versus land conversion/set aside practices versus grazing land practices). And, we should consider and decide upon the order of priority for the Act's purposes to help determine how to rank practice efficacy (e.g., do we focus on C sequestration, versus SH for WQ benefits, versus SH for resilience, biodiversity, long-term sustainability versus production/yield protection, or do we seek a blended approach?). Note that my rankings in this current exercise are weighted to a blended consideration of SH and C sequestration outcomes. The practices that I ranked "neutral" are ones aimed more at WQ outcomes (I'm unsure if WQ should be

considered part of the focus under the Act or not?). The practices I ranked "disagree" are ones that are aimed more toward production yield/profitability outcomes.

Ray Weil: Work to eliminate insecticide use as a default practice rather than in response to location-specific actual or predicted need. Default multi-chemical seed treatment comes to mind.

Kate Everts: There were two different farm types represented at the soil health meeting in March, those with large scale acreage and those with small farms. The range of conservation options available to the two types varies. I wonder if it would be more productive to split into two working groups based on farm scale.

Alan Girard: 1. Some practices should be further defined by management and type. For example, covers killed by roller crimpers should be prioritized over covers killed by herbicide or tillage; covers that are diverse should be prioritized over single species applications. Practices to define further include: a. Conservation Crop Rotation b. Contour Buffer Strips c. Cover Crop d. Irrigation Water Management e. Residue and Tillage Management, No Till f. Residue and Tillage Management, Reduced Till g. Forage and Biomass Planting 2. Emphasis should be placed on practices that do not already receive significant incentives. 3. Systems of practices that combine to produce soil health benefits should be prioritized over a single practice. Simply adding a practice to a set of others may not mean a system is achieved. 4. In-field practices should be prioritized over field-edge practices that do not include woody plants. 5. The potential to increase soil health benefits by modifying existing Maryland incentives like the cover crop program should be considered. 6. The diversity of Maryland farm types, practices, and benefits highlights the challenge of delivering incentives that will have value across the state. To increase its capacity to support farmers, MDA should coordinate closely with key partners including MASCD, Extension, Farm Bureau, Maryland Grain Producers, Future Harvest, and the Million Acre Challenge.

Dena Leibman: Agree with the idea of small group conversations to identify priority areas for incentives and educational programming/outreach.

Theodore Wickersham: I went through the above list of practices fairly quickly without looking at the Carbon sequestering potentials (in the charts you provided) or doing a detailed analysis of the economic benefits to farmers. Furthermore, the practices listed can be done well or poorly with huge variability to farmer profitability and environmental benefit. For example and as you know, cover cropping is a huge topic with many different approaches.... I suggest that the work groups look at the best practices being done for each topic selected with a special focus on where (and how) doing them provide highest benefits to producers and environment—likely where “systems approaches” are implemented with multiple practices, i.e., the whole is greater than the sum of the parts. I expect that modeling the soil health innovators successes and customizing them for Maryland will be key. Some of the producers on the Advisory Committee may be best to start with. Also, getting Ray Archuleta or others in https://soilhealthacademy.org/ or https://understandingag.com/ (ideally, David Brandt – corn and soy farmer) to help bring some of the expertise to MD.