



**Research on Adaptation to Climate Change Initiative
FARMER SURVEY**



ID _____

Thank you for taking the time to complete this survey. This survey is intended to be completed by Vermont Farmers. The goal of our research project is to work with farmers, agricultural service providers, researchers and community organizations to better understand which farming practices you use and how you choose them. Your input is extremely valuable to us! This survey should take 15-20 minutes to complete. It focuses on six key topics, including 1) farm characteristics; 2) farming practices; 3) how and why you make decisions on your farm; 4) nutrient management; 5) how weather and climate affect you; and 6) income and education information.

If you are not sure what a term or a practice means, please check the glossary at the end of the survey.

Your responses, name and identifying information will remain confidential.

Confidentiality statement

The information you provide will be used for statistical purposes only. In accordance with the Confidential Information Protection provisions of Title V, Subtitle A, Public Law 107-347 and other applicable Federal laws, your responses will be kept confidential and will not be disclosed in identifiable form to anyone other than employees or agents. By law, every employee and agent has taken an oath and is subject to a jail term, a fine, or both if he or she willfully discloses ANY identifiable information about you or your operation. Response is voluntary.

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a valid OMB control number. The valid OMB number is 0535-0039. The time required to complete this information collection is estimated to average 15 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

End of confidentiality statement

Section 1: Please tell us about your farm

1. How many years have you been farming? _____ years.

2. Land usage (in acres) for entire farm during the most recent growing season.

	Owned	Leased
Pasture		
Hay		
Row crops/small grains/corn		
Wetland		
Woodland pastured		
Woodland not pastured		
Vegetables/herbs		
Tree fruits		
Small fruits		
Fallow		
Other (farm buildings, roads, wasteland, etc.)		
TOTAL		

3. What bodies of water do you have on your property? (Please check all that apply)

No bodies of water on property		Intermittent streams	
Rivers		Vernal pools	
Streams		Ponds	
Creeks		Other (please describe)	

4. What agricultural goods generate income on your farm?

Product	Approx. Percentage of Total Sales	Product	Approx. Percentage of Total Sales
Vegetables		Dairy – cows	
Herbs		milkers	
Timber		heifers	
Maple Syrup		calves	
Grains for human consumption		bulls	
Grains for livestock feed		Dairy – sheep	
Hay		Dairy – goat	
Tree Fruit (raw, not processed)		Meat – beef	
Small Fruit (raw, not processed)		Meat – pork	
Value added fruit or vegetable products		Meat – chicken or other fowl	
Bedding plants		Meat – turkey	
Nursery Plants		Meat – Goat	
Christmas trees		Meat – lamb	
Sod		Wool – sheep	
Fluid Milk		Eggs – chickens or other fowl	
Dairy products (other than fluid milk)		Other (please describe)	

5. Management type (check all that apply)

Certified organic	
Organic, not certified	
Conventional	
Other (please describe below)	

Section 2: Please tell us about your farming practices

6. Which of the following practices do you currently implement on your farm? (check all that apply)

PRACTICE	Check if you use it
Hoop houses/high tunnels	
Green manures (crop residue incorporation into soil)	
Cover crops	
No till	
Timely manure incorporation	
Pest/disease management	
Invasive species management	
Irrigation (automated, drip, overhead)	
Conservation buffer strips (riparian buffers, wind breaks, stream corridors, buffer strips, shelter belts, hedgerows)	
Wetlands conservation	
Stormwater Runoff Management	
Drainage tile	
Rotational grazing	
Animal diversity	
Animal feed management	
Agroforestry (silvopasture, alley cropping, forest farming)	
Alternative energy (biomass, wind, solar, methane digesters)	
Reduced tillage (zone, strip, mulch, ridge)	
Wastewater Runoff Management (wastewater/washwater from barnyard, production area and silage bunker)	
Drainage ditches and diversions	
Nutrient management plan	
Insurance (farm policies, crop insurance, product liability)	

7. In the past year, have you noticed any on-farm soil or water resource problems that have negatively affected your agricultural operations? (Please check all that apply)

Poor drainage/soil saturation		Bank and Channel Erosion	
Potability		Excessive Runoff, Flooding, or Ponding	
Soil compaction		Drought	
Nutrient loss		Other (please describe)	
Sheet and Rill Erosion		None of the above	
Gully/Concentrated Flow Erosion			

Section 3: Please tell us about your use of conservation programs and practices

8. There are many different conservation practices that farmers use.

Suppose an agency offered to pay you to implement conservation practices on your farm for one year. Payments would be offered on a per acre basis. Conservation practices may be offered as singly or in groups. Which combination of practices would you be mostly likely to implement?

Consider each of the following combinations and rank them from 1 to 7, with 1 being the one you are most likely to choose, and 7 being the one you are least likely to choose. Use each number only once.

Please refer to the last page of this survey for definitions of conservation practices if needed.

CONSERVATION PRACTICES	RANK (1-7)
You will be paid \$30/acre to implement conservation tillage.	
You will be paid \$90/acre to implement cover cropping.	
You will be paid \$105/acre to implement conservation buffers.	
You will be paid \$120/acre to implement conservation tillage and cover cropping.	
You will be paid \$170/acre to implement conservation buffers and conservation tillage.	
You will be paid \$175/acre to implement cover crops and conservation buffer strips.	
You will be paid \$205/acre to implement cover crops, conservation buffers and conservation tillage.	

9. Are you currently enrolled in any federal government conservation programs (check all that apply)? If you are not enrolled in any of these, skip to question 11.

Conservation Program	Mark if applicable	What practices did you implement as a result of participation in this program?	Would you have used these practices without this program? (Y, N, Not sure)
I am not enrolled in any federal government conservation programs.			Y____ N____ Not sure____
Wildlife Habitat Incentives Program (WHIP)			Y____ N____ Not sure____
Environmental Quality Incentive Program (EQIP)			Y____ N____ Not sure____
Conservation Reserve Enhancement Program (CREP)			Y____ N____ Not sure____
Farm and Ranch Lands Protection Program (FRPP)			Y____ N____ Not sure____
Agricultural Management Assistance (AMA)			Y____ N____ Not sure____
Conservation Technical Assistance (CTA)			Y____ N____ Not sure____
Conservation Security Program (CSP)			Y____ N____ Not sure____
Current Use Program			Y____ N____ Not sure____
I participate in programs, but can't remember which ones			Y____ N____ Not sure____
Other (please describe)			Y____ N____ Not sure____

10. If you have enrolled and participated in the programs listed in question 9, please rank your reasons for enrolling and participating from 1 to 6, with 1 being your top reason. Use each number only once.

Financial compensation		Help with farm management issues	
Conservation/environmental health		Benefiting your community and landscape	
Improve agricultural production and profitability		Other (please identify)	

11. Do you have a conservation easement on your property (check one)?

No	
Yes	
Not sure	

12. If you answered “yes” to question 11, through which organization?

Section 4: Please tell us about how weather and climate affect you

13. A heavy rain event will _____. (Check one statement below to complete sentence)

Have a strongly net positive impact on my farm	
Have a positive net impact on my farm	
Have no net impact on my farm	
Have a negative net impact on my farm	
Have a strongly negative net impact on my farm	
Not sure	

14. Increasing extreme temperature events will _____. (Check one statement below to complete sentence)

Have a strongly net positive impact on my farm	
Have a positive net impact on my farm	
Have no net impact on my farm	
Have a negative net impact on my farm	
Have a strongly negative net impact on my farm	
Not sure	

15. A drought event will _____. (Check one statement below to complete sentence)

Have a strongly net positive impact on my farm	
Have a positive net impact on my farm	
Have no net impact on my farm	
Have a negative net impact on my farm	
Have a strongly negative net impact on my farm	
Not sure	

16. In your opinion, is the climate changing? (Check one)

No (skip to question 18)	
Yes	
Not sure	

17. If you believe the climate is changing, do you believe this will affect your farm in a negative way? (Check one)

No	
Yes	
Not sure	

Section 5: Please tell us about your current and future use of Soil and Nutrient Management Plans

18. This question asks if you make crop and soil management decisions based on visual assessment and/or testing of soil conditions. To what extent do the following soil indicators inform your crop and soil management decisions on the farm?

0: not monitored or used at all

1: monitored, but does not influence decision-making

2: monitored, but infrequently used to inform decision-making

3: monitored, and informs decision-making, but also depends on other factors

4: monitored, and is the main factor for certain farm management decisions.

Please circle only one

<i>How much do you use the following to make decisions?</i>	Circle one number per line.
Crop yield	0 – 1 – 2 – 3 – 4
Color and vigor of plants, quality of crop	0 – 1 – 2 – 3 – 4
Soil organic matter level	0 – 1 – 2 – 3 – 4
Nutrient content: NPK - Nitrogen, Phosphorus, Potassium, minor elements	0 – 1 – 2 – 3 – 4
“Look and feel” of soil, soil tilth, aggregate stability	0 – 1 – 2 – 3 – 4
Infiltration, runoff, ponding, poor drainage	0 – 1 – 2 – 3 – 4
Topsoil depth	0 – 1 – 2 – 3 – 4
Signs of erosion (gullies, rills, dust)	0 – 1 – 2 – 3 – 4
Compaction (surface and/or subsurface hardness)	0 – 1 – 2 – 3 – 4
Soil moisture and related plant stress, available water capacity	0 – 1 – 2 – 3 – 4
Soil pH (acidity, liming requirement)	0 – 1 – 2 – 3 – 4
Signs of life: earthworms, microbial activity, etc.	0 – 1 – 2 – 3 – 4
Disease pressure and pests in plant and soil	0 – 1 – 2 – 3 – 4
Field history (nitrogen credits from previous cropping or cover cropping, residual herbicide carryover, etc)	0 – 1 – 2 – 3 – 4

19. To what extent do the following types of soil tests and the accompanying agronomic recommendations inform your farm management decisions?

0: soil test is not used at all

1: soil test is used, but does not influence decision-making

2: soil test is used, but infrequently informs decision-making

3: soil test is used, and informs decision-making, but also depends on other factors

4: soil test is used, and is the main factor for certain farm management decisions.

Please circle only one

<i>How much do you use the following types of soil tests to make decisions?</i>	Circle one number per line
Composite Soil health test with biological, physical and chemical indicators (e.g., Cornell Soil Health Test)	0 – 1 – 2 – 3 – 4
Chemical Soil Test (e.g., University of Vermont, University of Maine)	0 – 1 – 2 – 3 – 4
Home soil test (handheld meter, pH strips, etc)	0 – 1 – 2 – 3 – 4
Other _____	0 – 1 – 2 – 3 – 4

20. In the past three years, have you written or had assistance to write a comprehensive nutrient management plan? (Please check all that apply)

No (skip to question 22)	
Yes, a trained professional assisted in completing a plan	
Yes, our farm staff or owners have completed training and a plan	
Yes, the plan was approved by a State or Federal Agency	
Yes, a formal plan is in the process of being developed	
Yes, partial nutrient management planning has been done, but does not address or measure all of the components of a comprehensive nutrient management plan	
Not sure	

21. Please check all reasons why you have chosen to develop a nutrient management plan.

Regulatory Compliance	
Eligibility for Cost-Shares and Incentive Programs	
Reduce nutrient outflows to environment	
Improve agronomic production	
Increase farm efficiency	

22. Please circle the extent to which you adopted each of the following Nutrient Management Practices in the past 3 years:

Use the following numbers in the extent of adoption column:

0 = no adoption

1 = adopted at one quarter of full capacity

2 = adopted at half of full capacity

3 = adopted at three quarters of full capacity

4 = adopted at full capacity

N/A = practice not included in nutrient management plan or not applicable in my case

PRACTICE	EXTENT OF ADOPTION (0-4)					
	0	1	2	3	4	N/A
Planned crop rotations						
Soil test at least every 3 years						
Strip Cropping						
N, P and K applications at rates recommended by soil tests						
Buffers at field edges						
Cover cropping						
Reduced tillage (strip, zone, and no)						
Applying manure at recommended rates and times						
Applying fertilizer at recommended rates						
Incorporating manure and fertilizer as quickly as possible after application						
Manure spreading setbacks (from water bodies and private/public wells)						

23. How do you feel about the adoption of the following nutrient management practices for your farming operation in the next one to three years? Please circle each practice on a scale from “very good” (1) to “very bad” (7):

Planned crop rotations	Very Good		Neutral			Very Bad		N/A
	1	2	3	4	5	6	7	
Soil test at least once every 3 years	1	2	3	4	5	6	7	N/A
Strip cropping	1	2	3	4	5	6	7	N/A
N, P and K application at rates recommended by soil tests	1	2	3	4	5	6	7	N/A
Buffers at edge of field	1	2	3	4	5	6	7	N/A
Cover cropping	1	2	3	4	5	6	7	N/A
Reduced tillage	1	2	3	4	5	6	7	N/A
Applying manure at recommended rates and times	1	2	3	4	5	6	7	N/A
Applying fertilizer at recommended rates	1	2	3	4	5	6	7	N/A
Incorporating manure and fertilizer as quickly as possible after application	1	2	3	4	5	6	7	N/A
Manure spreading setbacks from water bodies and wells	1	2	3	4	5	6	7	N/A

24. The next question is designed to help us understand who (friends and/or family, neighbors, or other farmers) may most strongly influence your decision to adopt conservation practices.

Under each conservation practice, please tell us how strongly you agree or disagree that friends and/or family, neighbors, or other farmers think you should adopt that practice, if applicable.

If no one influences your decisions, you can choose “not applicable” (N/A).

Planned crop rotations								
Your friends and/or family think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7	N/A
Your neighbors think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7	N/A
Other farmers think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7	N/A

Soil tests at least once every 3 years								
Your friends and/or family think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7	N/A
Your neighbors think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7	N/A
Other farmers think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7	N/A

Strip Cropping							
Your friends and/or family think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7 N/A
Your neighbors think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7 N/A
Other farmers think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7 N/A

N, P and K application at rates recommended by soil tests							
Your friends and/or family think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7 N/A
Your neighbors think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7 N/A
Other farmers think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7 N/A

Buffers at the edge of fields							
Your friends and/or family think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7 N/A
Your neighbors think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7 N/A
Other farmers think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7 N/A

Cover cropping								
Your friends and/or family think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7	N/A
Your neighbors think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7	N/A
Other farmers think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7	N/A

Reduced Tillage								
Your friends and/or family think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7	N/A
Your neighbors think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7	N/A
Other farmers think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7	N/A

Applying manure at the recommended rates and times								
Your friends and/or family think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7	N/A
Your neighbors think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7	N/A
Other farmers think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7	N/A

Applying fertilizer at the recommended rates								
Your friends and/or family think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7	N/A
Your neighbors think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7	N/A
Other farmers think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7	N/A

Incorporating manure and fertilizer as quickly as possible after application								
Your friends and/or family think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7	N/A
Your neighbors think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7	N/A
Other farmers think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7	N/A

Manure spreading setbacks from water bodies and wells								
Your friends and/or family think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7	N/A
Your neighbors think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7	N/A
Other farmers think you should adopt	Strongly agree 1	2	3	Neutral 4	5	Strongly disagree 6	7	N/A

25. Are you confident that you can adopt/continue implementing the following Nutrient Management Practices? Please circle each practice on a scale from highly confident (1) to no confidence (7).

Planned crop rotations	Highly confident 1 2 3 4 5	No confidence 6 7	N/A
Soil test at least once every 3 years	Highly confident 1 2 3 4 5	No confidence 6 7	N/A
Strip cropping	Highly confident 1 2 3 4 5	No confidence 6 7	N/A
N, P and K application at rates recommended by soil tests	Highly confident 1 2 3 4 5	No confidence 6 7	N/A
Buffers at edge of field	Highly confident 1 2 3 4 5	No confidence 6 7	N/A
Cover cropping	Highly confident 1 2 3 4 5	No confidence 6 7	N/A
Reduced tillage	Highly confident 1 2 3 4 5	No confidence 6 7	N/A
Applying manure at the recommended rates and times	Highly confident 1 2 3 4 5	No confidence 6 7	N/A
Applying fertilizer at recommended rates	Highly confident 1 2 3 4 5	No confidence 6 7	N/A
Incorporating manure and fertilizer as quickly as possible after application	Highly confident 1 2 3 4 5	No confidence 6 7	N/A
Manure spreading setbacks from water bodies and wells	Highly confident 1 2 3 4 5	No confidence 6 7	N/A

26. If you do not already use the following Nutrient Management Practices, do you intend to adopt them in the next three years? Please circle for each practice on a scale from highly likely (1) to highly unlikely (7).

Practice	I already use this practice (y/n)	My intention to adopt this practice is							
Planned crop rotations		Highly likely 1	2	3	4	5	6	Unlikely 7	N/A
Soil test at least once every 3 years		Highly likely 1	2	3	4	5	6	Unlikely 7	N/A
Strip cropping		Highly likely 1	2	3	4	5	6	Unlikely 7	N/A
N, P and K application at rates recommended by soil tests		Highly likely 1	2	3	4	5	6	Unlikely 7	N/A
Buffers at edge of field		Highly likely 1	2	3	4	5	6	Unlikely 7	N/A
Cover cropping		Highly likely 1	2	3	4	5	6	Unlikely 7	N/A
Reduced tillage		Highly likely 1	2	3	4	5	6	Unlikely 7	N/A
Applying manure at the recommended rates and times		Highly likely 1	2	3	4	5	6	Unlikely 7	N/A
Applying fertilizer at recommended rates		Highly likely 1	2	3	4	5	6	Unlikely 7	N/A
Incorporating manure and fertilizer as quickly as possible after application		Highly likely 1	2	3	4	5	6	Unlikely 7	N/A
Manure spreading setbacks from water bodies and wells		Highly likely 1	2	3	4	5	6	Unlikely 7	N/A

Section 6: Please tell us about yourself – your information will be kept confidential

27. In addition to your farm work, do you work off-farm at any point during the year? Please check one.

No	
Yes	
Not sure	

28. What percent of your household income is generated from the farm? _____%

29. What was the **gross** income from your farm in 2015? Please check one.

\$0-\$9,999		\$100,000 - \$124,999	
\$10,000 - \$24,999		\$125,000 - \$149,999	
\$25,000 - \$49,999		\$150,000 - \$174,999	
\$50,000 - \$74,999		\$175,000 - \$199,999	
\$75,000 - \$99,999		\$200,000+	

30. What was the **net** income for your farm in 2015? Please check one.

Less than \$0 (net loss)			
\$0 - \$9,999		\$100,000 - \$124,999	
\$10,000 - \$24,999		\$125,000 - \$149,999	
\$25,000 - \$49,999		\$150,000 - \$174,999	
\$50,000 - \$74,999		\$175,000 - \$199,999	
\$75,000 - \$99,999		\$200,000+	

31. In what year were you born? Please check one.

1910-1919		1960-1969	
1920-1929		1970-1979	
1930-1939		1980-1989	
1940-1949		1990-1999	
1950-1959			

32. Highest level of education achieved? Please check one.

Some high school	<input type="checkbox"/>	Associate's Degree	<input type="checkbox"/>
High school degree/GED	<input checked="" type="checkbox"/>	Bachelor's Degree	<input checked="" type="checkbox"/>
Some college	<input type="checkbox"/>	Graduate Degree	<input type="checkbox"/>

Thank you for finishing the survey!

Glossary Definitions

Adaptation: Planning for the changes that are expected to occur as a result of climate change. (EPA)

Agroforestry: Agroforestry intentionally combines agriculture and forestry to create integrated and sustainable land-use systems. Agroforestry takes advantage of the interactive benefits from combining trees and shrubs with crops and/or livestock. (USDA National Agroforestry Center)

Animal Feed Management: Feeding a balanced diet, avoiding overfeeding, and providing abundant supplies of cool, clean, and pure water will help to optimize feed and nutrient use on an animal farm. (UVM Extension, eXtension)

Bank and Channel Erosion: Stream stability is an active process, and while streambank erosion is a natural part of this process, it is often accelerated by altering the stream system. Streambank erosion is that part of the channel erosion in which material is eroded from the streambank and deposited at the base of the slope or in the channel. Streambank erosion is usually associated with erosion of the streambed. It occurs along perennial, intermittent, and ephemeral streams. (NRCS)

Composite Soil Health Test: The concept of soil health deals with integrating the physical, biological and chemical components of the soil. Physical components include but are not limited to texture, bulk density, and Macro-porosity. Biological components include but are not limited to organic matter content, microbial respiration rate, and soil proteins. Chemical components include but are not limited to P, N, K, and PH. (<http://www.css.cornell.edu/extension/soil-health/manual.pdf>)

Conservation buffers: Strips of land maintained in permanent vegetation. These buffers can be used in a systems approach to manage soil, water, nutrients, and pesticides for sustainable agricultural production, while minimizing environmental impact. (NRCS)

Conservation tillage (Reduced tillage): A number of strategies and techniques for establishing crops in the previous crop's residues, which are purposely left on the soil surface. The principal benefits of conservation tillage are improved water conservation and the reduction of soil erosion. Additional potential benefits include reduced fuel consumption, planting and harvesting flexibility, reduced labor requirements, and improved soil tilth. Two of the most common conservation tillage systems are zone tillage and no-till. (ATTRA)

Cover crops: Crops, including grasses, legumes, and forbs, used to provide vegetative cover for natural resource protection and improvement. (USDA)

Creek: In North America, Australia and New Zealand, a small to medium-sized natural stream. Sometimes navigable by motor craft and may be intermittent. (Wikipedia)

Deep zone tillage: Deep zone tillage uses a 5-inch-wide tilled strip to simultaneously break up plow pans, warm the soil and prepare a seedbed. A deep shank or subsoiler (zone-builder) breaks up the plow-pan while fluted coulters cut and prepare a strip in the killed residue/cover crop, and rolling baskets help break up soil clods to prepare the narrow seedbed. (University of Connecticut)

Drainage tile: A type of subsurface drainage used in areas with moist soils or the experience standing water. The purpose of subsurface drainage is to lower the water table in the soil. The water table is the level at which the soil is entirely saturated with water. The excess water must be removed to a level below the ground surface where it will not interfere with plant root growth and development. (Iowa State University)

Crop rotation: Growing crops in a planned sequence on the same field. (NRCS)

Green Manure: The term "green manure" refers to cover crops that are tilled into the soil. Green manures are mainly grown to increase soil organic matter (OM). (NRCS)

Gully/Concentrated Flow Erosion: Ephemeral and classic gully are forms of erosion created by the concentrated flow of water. They are easily identified through visual observation. An ephemeral cropland gully is larger than a rill and smaller than a classic gully. They usually result from the junction of rills that form a branching or tree-like pattern of channels. Ephemeral gullies usually appear on cultivated fields during the planting or growing season, but are temporarily removed by cultivation. (NRCS)

Hoop Houses/High Tunnels: A seasonal tunnel system is a polyethylene (plastic) covered structure that is used to cover crops to extend the growing season. They are also known as high tunnels, hoop houses, or cold tunnels. They are used to extend the growing season for crops by approximately two to three weeks on each end of the season by increasing the temperature surrounding the crop and minimizing the heat loss during the night. (NRCS)

Keyline plowing: Keyline plowing can help alleviate compaction and has been reported to help improve soil quality and build organic matter. The thin, cast shanks (~3/4") and coulter wheels of the Yeomans' Keyline subsoil plow aerate subsoil while causing minimal disruption to the pasture surface. (University of Vermont)

Mitigation: Mitigation refers to technological change and substitution that reduce energy resource inputs and emissions per unit of output. Specific to climate change, mitigation encompasses implementing policies and practices to reduce greenhouse gas emissions and to enhance sinks. (IPCC, 2001).

No till: No-till cropping systems are based on the concept of keeping the soil covered at all times. They include the use of crop rotations, cover cropping, and planting into a seed slot created by coulters. (NRCS)

Nutrient management plan: Established plan for managing the amount (rate), source, placement (method of application), and timing of plant nutrients and soil amendments. Benefits include nutrient conservation and improved air, water, and soil quality. This practice applies to all lands where plant nutrients and soil amendments are applied. This standard does not apply to one-time nutrient applications to establish perennial crops. (USDA)

Rotational Grazing: Exposing animals to limited grazing areas for set periods of time, then providing adequate periods of rest for the grass. The system requires careful management to ensure that animals do not trample or eat grass so close to the ground that its regrowth is hampered. It is sometimes called "prescribed" if grazing systems are set up in advance, paddocks are numbered, and movement of the animals progresses in a prescribed order. (UVM Center for Sustainable Agriculture)

Sheet, Rill and Wind Erosion: Wind or water erosion is the physical wearing of the earth's surface. Erosion is not always readily visible even when soil loss exceeds unsustainable levels. Symptoms of soil erosion by water may be identified by small rills and channels on the soil surface, soil deposited at the base of slopes, sediment in streams, lakes and reservoirs, and pedestals of soil supporting pebbles and plant material. Water erosion is most obvious on steep, convex landscape positions. Symptoms of wind erosion may be identified by dust clouds, soil accumulation along fence lines or snowbanks and a drifted appearance of the soil surface. (NRCS)

Soil tilth: Physical condition of soil, especially in relation to its suitability for planting or growing a crop. Factors that determine tilth include the formation and stability of aggregated soil particles, moisture content, degree of aeration, rate of water infiltration, and drainage. (<http://www.britannica.com/science/tilth>)

Strip cropping: Growing planned rotations of row crops, forages, small grains, or fallow in a systematic arrangement of equal width strips across a field. (NRCS)

Stormwater runoff management: Stormwater runoff is generated when precipitation from rain and snowmelt events flows over land or impervious surfaces and does not percolate into the ground. As the runoff flows over the land or impervious surfaces (paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment or other pollutants that could adversely affect water quality if the runoff is discharged untreated. The primary method to control stormwater discharges is the use of best management practices (BMPs). (EPA)

Wetlands conservation: Protecting wetlands, wildlife habitat, soil, water, and related natural resources in an environmentally beneficial and cost effective manner. (USDA)

Vernal pools: They also called vernal ponds or ephemeral pools, are temporary pools of water that provide habitat for distinctive plants and animals. (Wikipedia)