



Joyce Meader

Board Member
Education Committee



MEATWORKS

THE LIVESTOCK
INSTITUTE
OF SOUTHERN NEW ENGLAND



CONSERVATION
AGRICULTURAL
LEASES

ADD
DIVERSITY
TO THE USE OF
VALUABLE
SOIL



**No Farms
No Food
No Future**



American Farmland Trust

**FARMS
UNDER
THREAT**

THE STATE OF THE STATES
Agricultural Land Conversion Highlight Summary

Massachusetts

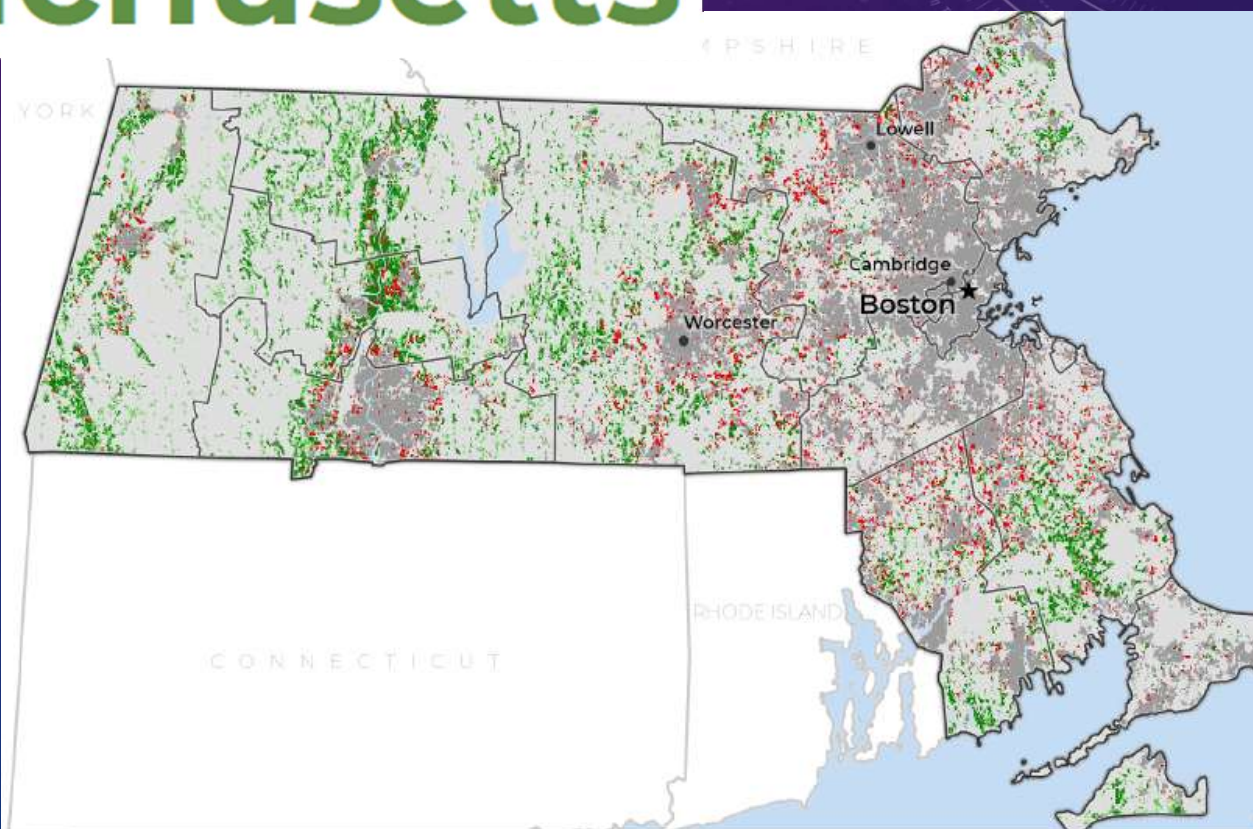
**AMERICAN
FARMLAND
TRUST**

2001-2016

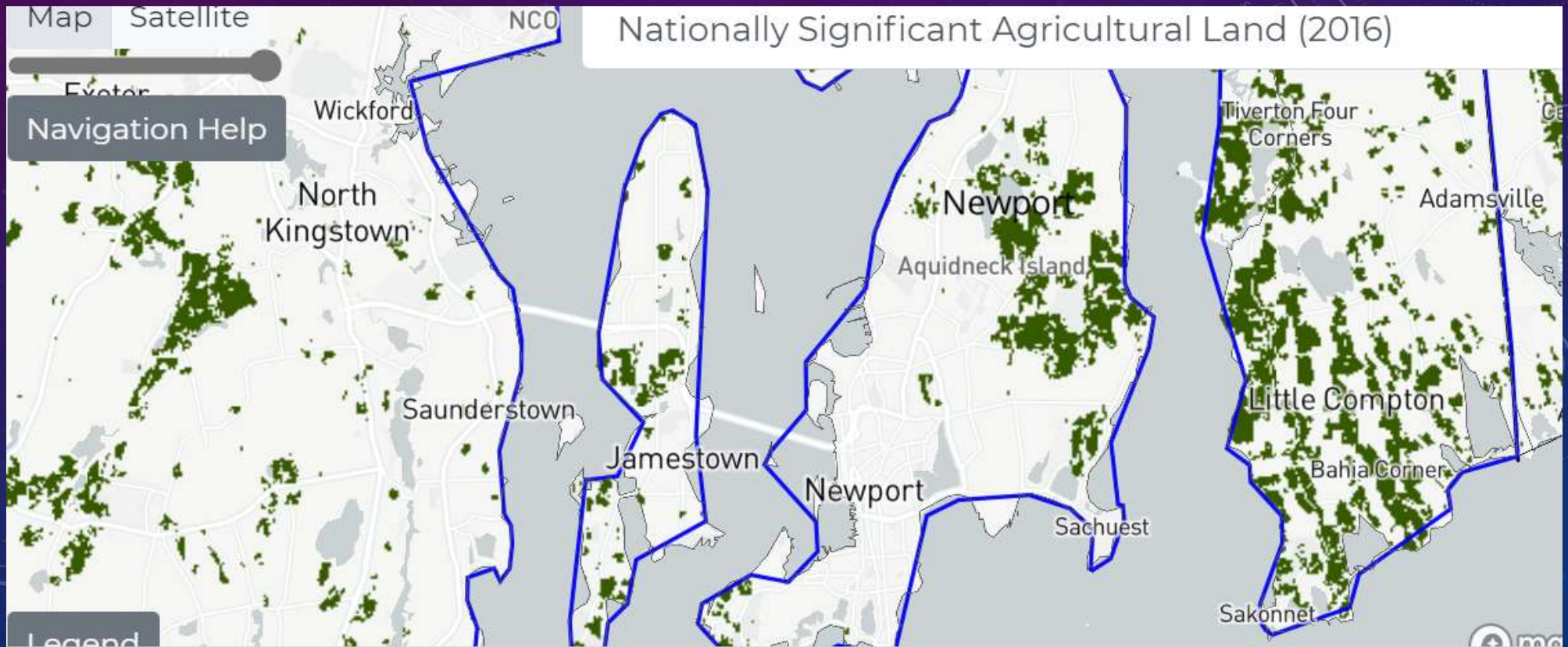
Farmland (green)
to

Development (red)

<https://farmlandinfo.org/publications/farms-under-threat-the-state-of-the-states/>



Rhode Island Nationally Significant Ag Lands 2016



Three Connecticut land trust case studies



<https://newfarms.uconn.edu/farmland/>



New England
Farmland Finder

About

Search Properties

Submit a Property

Resources



A regional farm property clearinghouse

<https://newenglandfarmlandfinder.org/search-properties>

CONSERVATION LEASES

DEVELOPING A WIN-WIN ARRANGEMENT

Farmer's Goal:

- Sustainable farm business*
- Harvested nutrients per acre*

Landlord's Goal:

- Supportive local community.*
- Wildlife food source / habitat*

For Both:

- Soil Health**
- Invasives minimized.**

HOW TO ATTRACT A FARMER:

MAXIMUM PLANT GROWTH/ ROOT HEALTH



The background is a dark blue gradient with faint technical diagrams. On the left, there is a circular scale with numerical markings from 160 to 260 in increments of 10. To the right, there are several overlapping circles and dashed lines, some with arrows indicating a clockwise direction. The overall aesthetic is technical and scientific.

SOIL TEXTURE

ROCKINESS

SLOPE

AVAILABLE WATER CAPACITY

[Web Soil Survey - Home \(usda.gov\)](http://usda.gov)



[Home](#) [About Soils](#) [Help](#) [Contact Us](#)

You are here: [Web Soil Survey Home](#)

The simple yet powerful way to access and use soil data.



click

I Want To...

- [Start Web Soil Survey \(WSS\)](#)
- [Know the requirements for running Web Soil Survey – will Web Soil Survey work in my web browser?](#)
- [Know the Web Soil Survey hours of operation](#)
- [Find what areas of the U.S. have soil data](#)

Welcome to Web Soil Survey (WSS)



Web Soil Survey (WSS) provides soil data and information produced by the National Cooperative Soil Survey. It is operated by the USDA Natural Resources Conservation Service (NRCS) and provides access to the largest natural resource information system in the world. NRCS has soil maps and data available online for more than 95 percent of the nation's counties and

anticipates having 100 percent in the near future. The site is updated and maintained online as the single authoritative source of soil survey information.

Announcements/Events

- [Web Soil Survey 2.3 has been released! View description of new features.](#)
- [Web Soil Survey Release History](#)

Search for keywords

Search Sites

Search by Subject

- [Home](#)
- [Cooperative Soil Survey \(NCSS\)](#)
- [Soil Surveys](#)
- [Maps](#)
- [Soil Series](#)
- [Soils \(OSD\)](#)
- [Soils Extent Tool](#)
- [Soil Mart](#)

Outline the property being leased

The screenshot shows the Soil Data Explorer web application interface. At the top, there are navigation tabs: "Area of Interest (AOI)", "Soil Map", "Soil Data Explorer", and "Shopping Cart (Free)". Below these are buttons for "View Soil Information By Use: All Uses", "Printable Version", and "Add to Shopping Cart". A secondary row of tabs includes "Intro to Soils", "Suitabilities and Limitations for Use", "Soil Properties and Qualities", "Ecological Site Assessment", and "Soil Reports".

On the left side, there is a "Search" section and a "Suitabilities and Limitations Ratings" section with expandable categories: "Building Site Development", "Construction Management", "Disaster Recovery Planning", "Land Classifications", "Conservation Tree and Shrub Group", "Ecological Site ID", "Ecological Site Name", "Farmland Classification", "Forage Suitability Group ID (Component Table)", "Hybrid Rating by Map Unit", "Irrigated Capability Class", "Irrigated Capability Subclass", and "Nonirrigated Capability Class". The "Nonirrigated Capability Class" category is selected and highlighted in red, with a red arrow labeled "4" pointing to it. Below this category are buttons for "View Description" and "View Rating".

At the bottom left, there is a "View Options" section with checkboxes for "Map", "Table", "Description of Rating", and "Rating Options".

On the right side, there is a map titled "Map - Nonirrigated Capability Class" showing a satellite view of a property with colored overlays representing different soil capability classes. A white text box is overlaid on the map with the following text:

To get the soils ratings, click on:

1. Soil Data Explorer
2. Land Classifications
3. Nonirrigated Capability Class
4. View Rating

Red arrows labeled "1" through "5" point to the following elements in the interface:

- 1. "Soil Data Explorer" tab
- 2. "Land Classifications" category
- 3. "Nonirrigated Capability Class" category
- 4. "View Rating" button
- 5. "Printable Version" button

HOW TO ATTRACT A FARMER:

MAXIMUM PLANT GROWTH/ ROOT HEALTH

Soil Organic Matter



A well structured soil

ROLE OF ORGANIC MATTER IN SOILS

- WATER HOLDING CAPACITY**
- SOIL STRUCTURE (AIR/ WATER/ ROOTS)**
- FEEDS MICROBES**
- SLOW NUTRIENT RELEASE**
- INCREASED PLANT YIELDS**

HOW TO ATTRACT A FARMER:

MAXIMUM PLANT GROWTH/ ROOT HEALTH

SOIL ORGANIC MATTER





\$6 SOIL OM TEST

PH / NUTRIENT LEVEL

\$26 SOIL TEST

<https://ag.umass.edu/services/soil-plant-nutrient-testing-laboratory/lab-services>

P
A
S
T
U
R
E

		Below Optimum
Calcium	1495 lbs/acre	
Magnesium	263 lbs/acre	
Phosphorus	2 lbs/acre	
Potassium	61 lbs/acre	

Soil pH (1:1, H2O)

6.0

6.0

Est. Cation Exch. Capacity
(cmole+/100g)

8.4

% Organic Matter

5.2%

5.2

* Excessive or

Element

Boron

Copper

Iron (D

Sand: 7% - Silt: 77% - Clay: 14%

CORNELL SOIL HEALTH LAB
Long term Sod

Group	Indicator	Value	Rating
physical	Available Water Capacity	0.27	95
physical	Surface Hardness	95	79
physical	Subsurface Hardness	151	91
physical	Aggregate Stability	52.7	88

Comprehensive Assessment of Soil Health

<http://soilhealth.cals.cornell.edu>

HOW TO ATTRACT A FARMER:

CURRENT CROP: FOREST OR OPEN?

SPECIES: ORCHARDGRASS OR BLUEGRASS?

PRODUCTIVE STAGE: RECENTLY PLANTED?

INVASIVES: MOWING CONTROLS OR DEEP ROOTS?

LAND LEASE

This lease made the _____ day of _____, 2020,
between _____, owner, of _____, MA,
and _____, lessee, of _____, MA

Operation and Maintenance of Land:

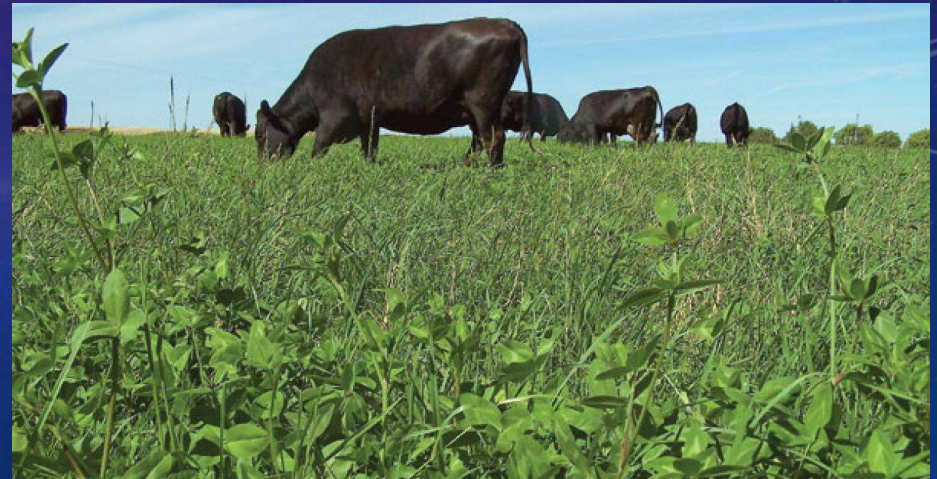
“The land shall be continuously covered with growing perennial or annual crops, ensuring adequate soil organic matter “.

LIVING ROOTS:

- **A BIOLOGICAL COMMUNITY IN THE SOIL**
- **PROTECT SOIL FROM EROSION**
- **BUILD ORGANIC MATTER TO HOLD WATER**

PERENNIALS grasses , legumes, fruits:

- Extensive roots / soil organic matter
- Less planting and soil exposure
- Pastures rested for maximum root mass



ANNUALS
CORN,
SMALL GRAINS,
VEGETABLES



Lots of nutrients per acre

BUT, Annual decomposition

SO, Cover crops important

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“Winter cover crops will be seeded as the cash crop is harvested, with a deadline of _____ to protect land from erosion until spring seeding”.

COVER CROPS

- PLANTS THAT KEEP THE SOIL COVERED
- INTER SEEDED INTO GROWING CASH CROPS
- OR SEEDED AFTER THE HARVEST
- PLANTING DEADLINE (OCT 1) OFTEN MISSED !!

BARE LAND

FALL TILLAGE
LATE COVER CROP SEEDING
EROSION

Exposes organic matter

Oxygen speeds up decomposition



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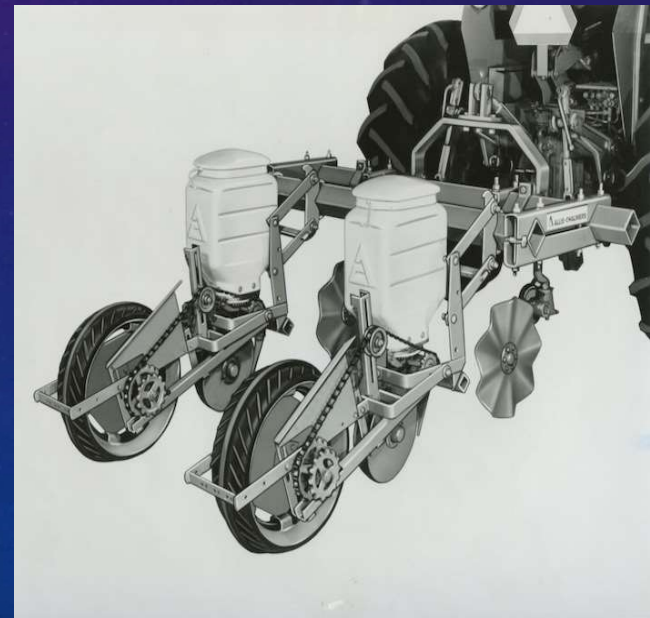
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REDUCED TILLAGE WILL BE PRACTICED WHEN POSSIBLE

NO TILL SEEDING

- **COULTERS OPEN SLIT**
- **SEED TUBE DEPOSITS SEED**
- **PACKER WHEELS CLOSE SLIT**
-



CORN FIELD

<i>Analysis</i>	<i>Value Found</i>	<i>Optimum Range</i>	<i>Analysis</i>	<i>Value Found</i>	<i>Optimum Range</i>
Soil pH (1:1, H ₂ O)	6.6		Cation Exch. Capacity, meq/100g	8.3	
Modified Morgan extractable, ppm			Exch. Acidity, meq/100g	1.3	
<i>Macronutrients</i>			Base Saturation, %		
Phosphorus (P)	41.1	4-14	Calcium Base Saturation	68	50-80
Potassium (K)	94	100-160	Magnesium Base Saturation	13	10-30
Calcium (Ca)	1123	1000-1500	Potassium Base Saturation	3	2.0-7.0
Magnesium (Mg)	129	50-120	Scoop Density, g/cc	1.00	
Sulfur (S)	9.1	>10	Optional tests		
<i>Micronutrients</i> *			Soil Organic Matter (LOI), %	2.8	2.8%
Boron (B)	0.5	0.1-0.5	Nitrate-N (NO ₃ -N), ppm	25	

Sand: **10%** - Silt: **73%** - Clay: **16%**

**CORNELL SOIL HEALTH
Moldboards Plow –
Annual Grain**

Group	Indicator	Value	Rating	Constr
physical	Available Water Capacity	0.16	52	
physical	Surface Hardness	260	12	Rooting, Water Transmission
physical	Subsurface Hardness	340	35	
physical	Aggregate Stability	13.4	16	Aeration, Infiltration, Rooting, Crusting, Sealing, Erosion, Runoff

Comprehensive Assessment of Soil Health

<http://soilhealth.cals.cornell.edu>

LAND LEASE

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“The land shall be continuously covered with growing perennial or annual crops, ensuring adequate soil organic matter . Winter cover crops will be seeded as the cash crop is harvested, with a deadline of _____to protect land from erosion until spring seeding.

Crops will be fertilized at proper rate and timing .

CORN FIELD

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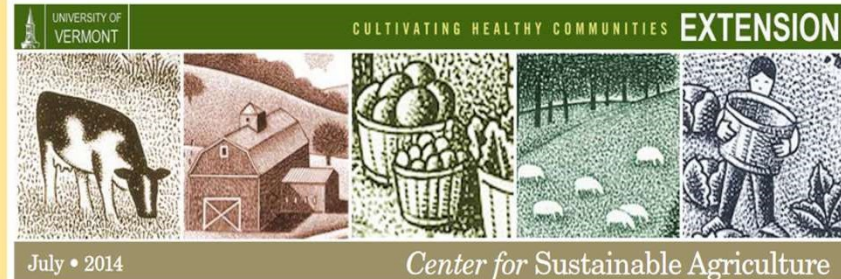
“The land shall be continuously covered with growing perennial or annual crops, ensuring adequate soil organic matter. Winter cover crops will be seeded as the cash crop is harvested, with a deadline of _____ to protect land from erosion until spring seeding. Crops will be fertilized at proper rate and timing. Reduced tillage will be practiced when possible.

Invasive species will be controlled by mowing or chemical sprays.

Field borders and pasture fencing will be maintained.

How to Determine the Right Farm Rental Rate

<https://newfarms.uconn.edu/>



The DIRT-5 Formula

Type of Ownership Cost	Relevance to Type of Asset
Depreciation	Equipment, Buildings, Infrastructure
Insurance	Land, Equipment, Buildings, Infrastructure
Repairs and Maintenance	Equipment, Buildings, Infrastructure*
Taxes	Land, Buildings
Interest and Opportunity Cost	Land, Equipment, Buildings, Infrastructure



Keeping Farmers on the Land

The ownership of 40%
of America's agricultural land will
transition in the next 15 years.

American Farmland Trust 2020

Returns over Variable Costs

Fixed Costs

Income / unit

- Variable Costs

= ROVC / Unit

Or Returns over Variable Cost
or "efficiency"

ROVC/unit

Variable
Costs per
Unit

X # of units SOLD

= Affordable
Fixed Costs

Loan payments

Insurance

Salary

RENT



FARMLAND CONSERVATION 2.0

HOW LAND TRUSTS CAN PROTECT AMERICA'S WORKING FARMS

OPAV or "Option to Purchase at Affordable Value"

The holder of a conservation easement (ex. Land trust), has the right to purchase the protected land at ag value.

(has first refusal when landowner attempts a sale to a 'non-farmer' at unaffordable price for agricultural use)

Farmland ConneCTions

A Guide for Connecticut Towns, Institutions and Land Trusts
Using or Leasing Farmland


American Farmland Trust
SAVING THE LAND THAT SUSTAINS US

A photograph of three people standing in a field with trees in the background. One person is wearing a green shirt and a green hat, another is wearing a blue shirt, and the third is wearing a grey shirt. They appear to be engaged in a discussion or activity in the field.

**IMPROVING
ACCESS TO
FARMLAND
WEBINAR**

A Landowner's Guide
to Leasing Land
for Farming

<https://newfarms.uconn.edu/farmland/>



Thank You!
Joyce Meader
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Southern New England
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