Characterization of New York Soil Health by Texture and Cropping System

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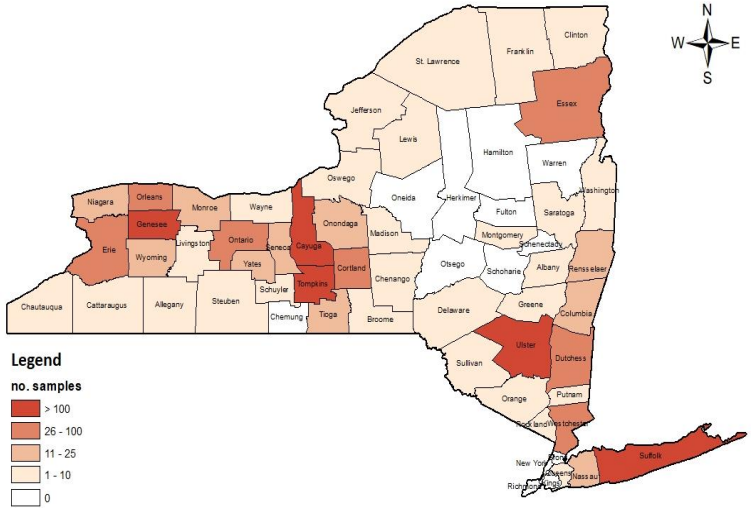
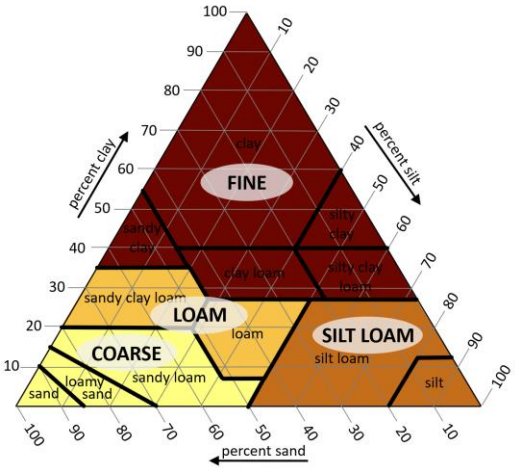
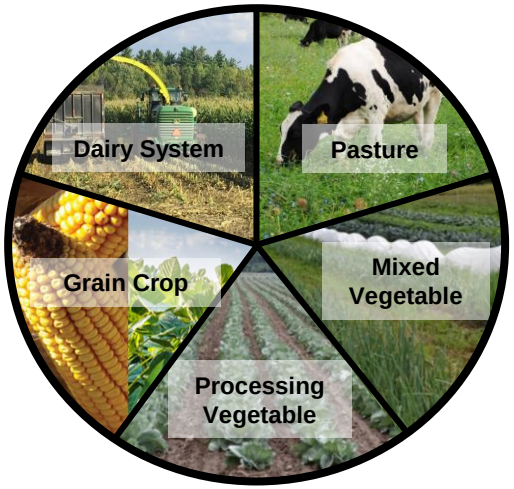






Cornell Soil Health Laboratory

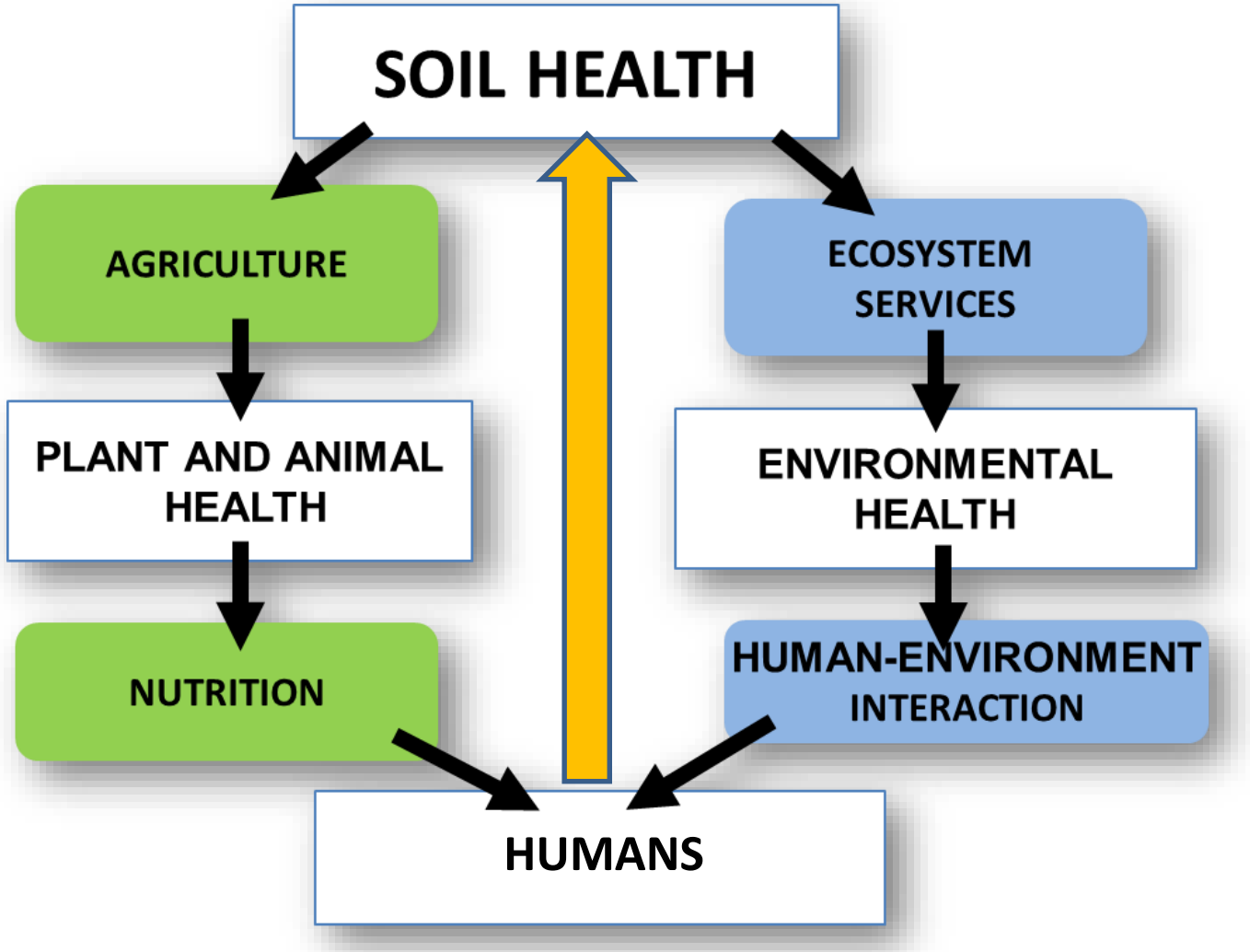
CornellCALS College of Agriculture and Life Sciences

NEW YORK SOIL HEALTH

Inherent vs. dynamic soil quality

- Inherent quality
  - The result of a location's unique minerals, climate, biology, topography, and time
- Dynamic quality
  - Changes due to human use and management
- Soil health focuses on dynamic and anthropogenic aspects of soil quality

Soil Health and Human Interactions

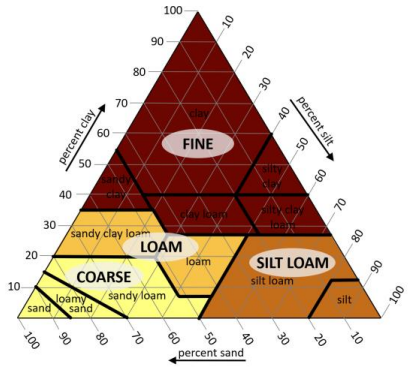


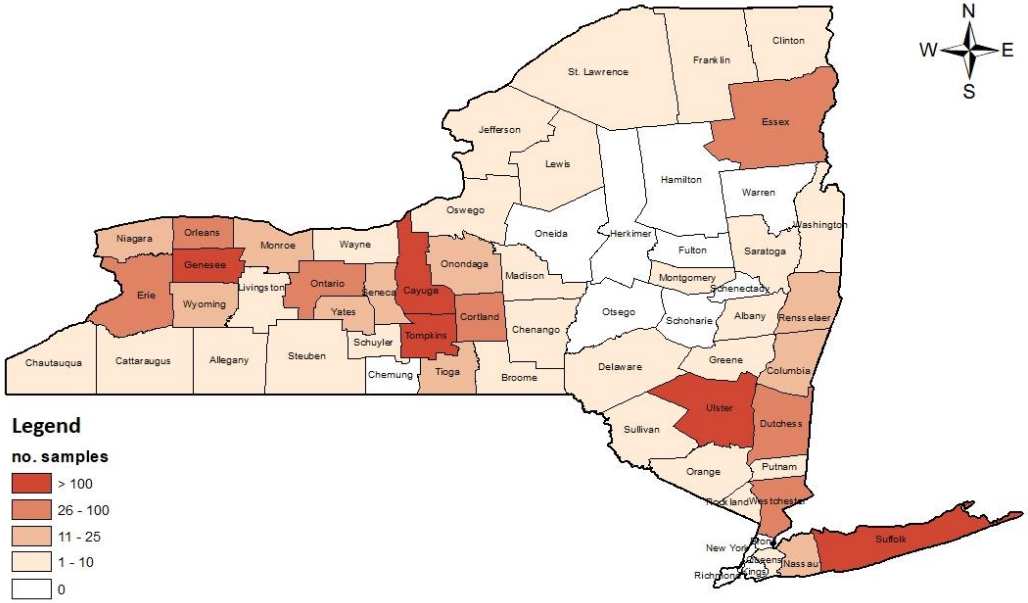
These are both Buxton Silt Loams

A soil test says this soil is better – why?

Dorn Cox, 2012

Bianca Moebius-Clune, 2012





Characterization of New York Soil Health by Texture and Cropping System

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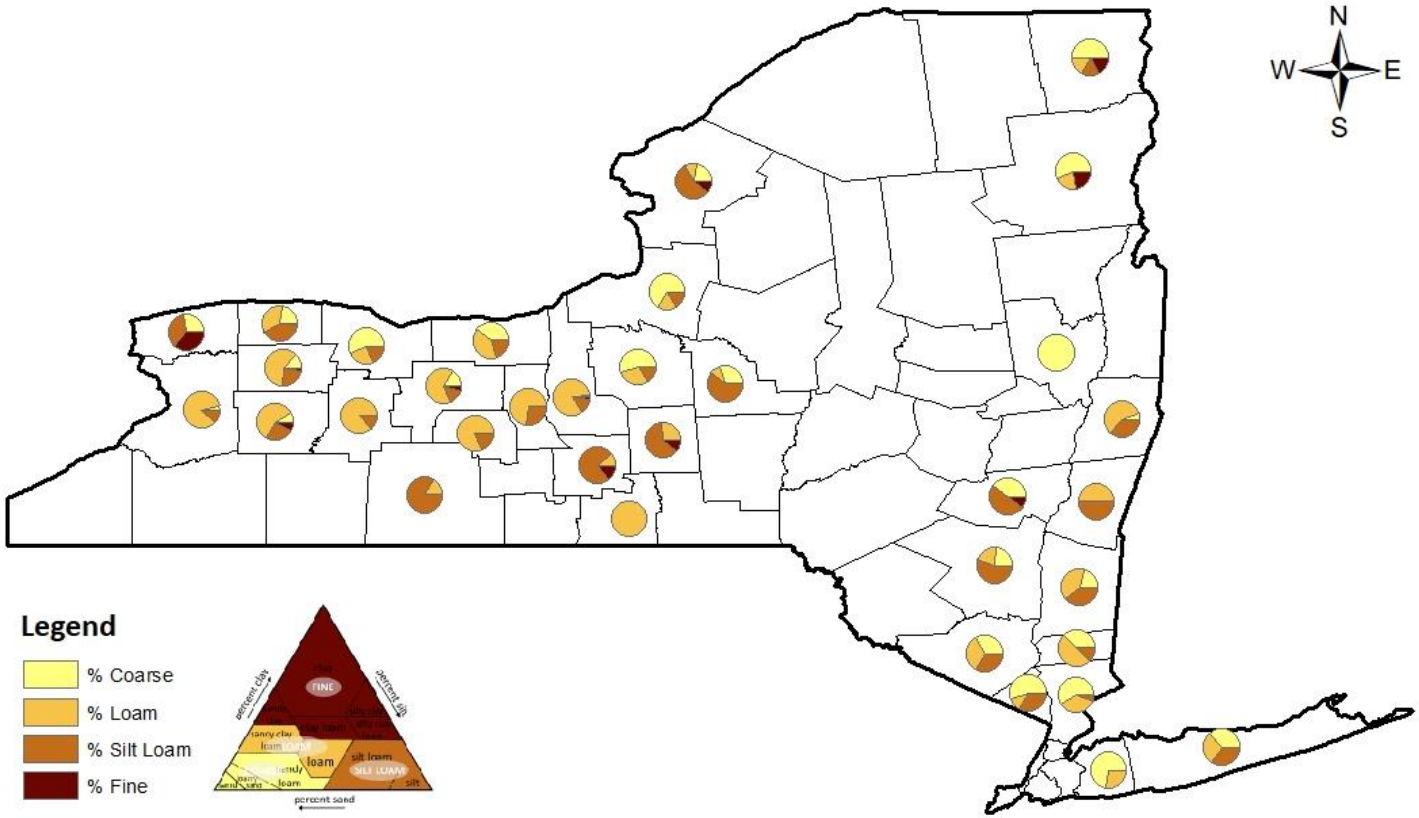
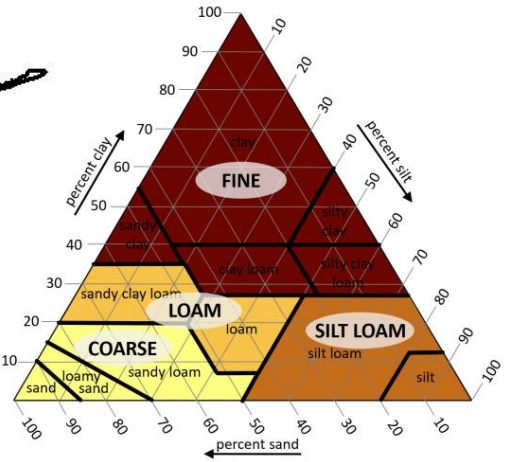
Soil and Crop Sciences Section, Cornell University

New York Soil Health Characterization by texture (Inherent Property)



Legend

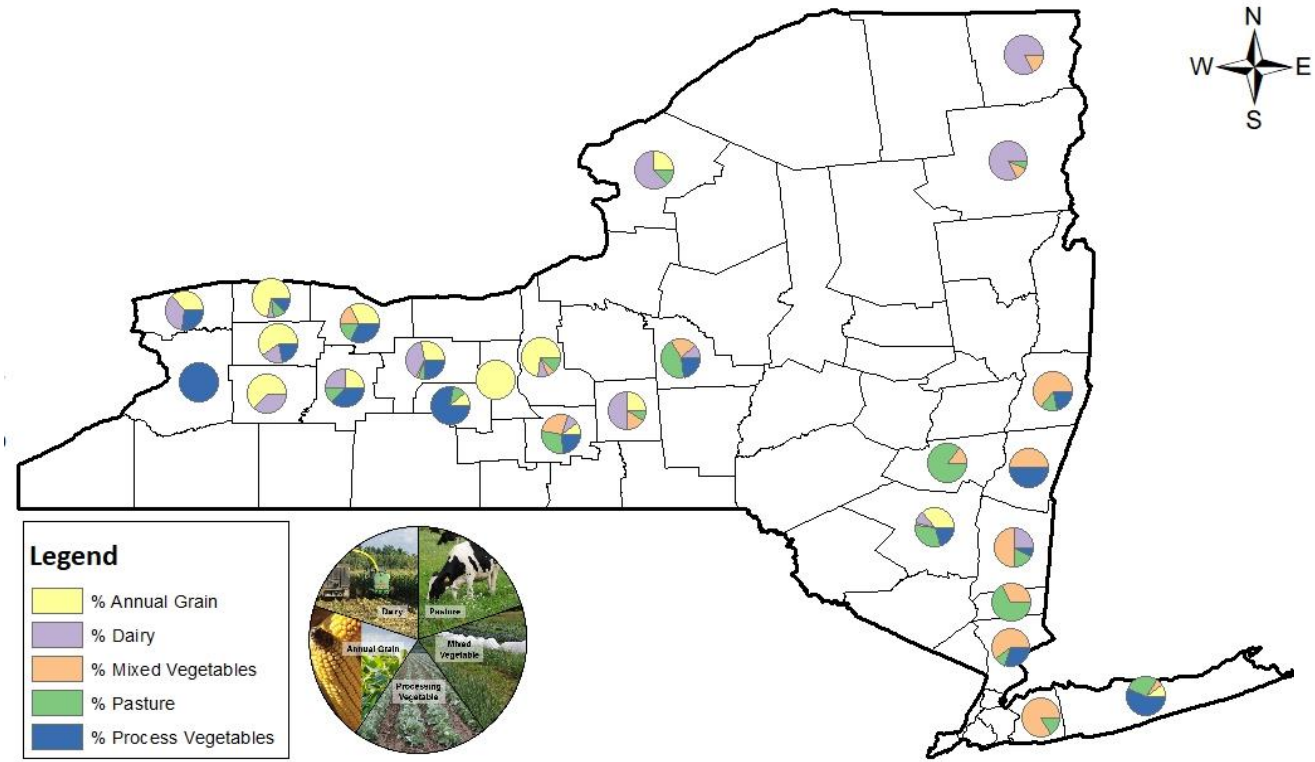
- % Coarse
- % Loam
- % Silt Loam
- % Fine

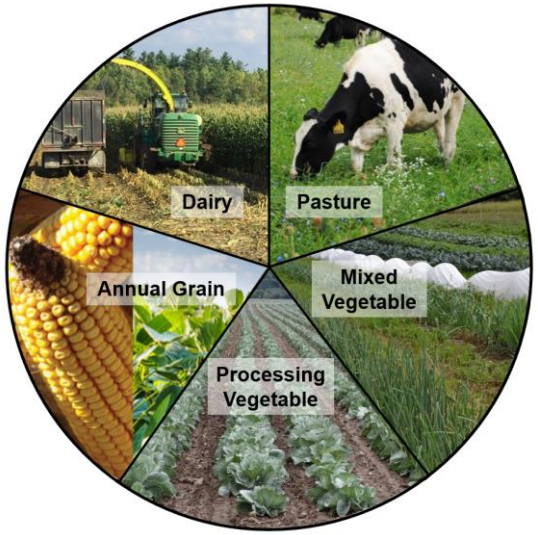


Fine textured soils can store more organic matter than coarse textured soils

Texture	n	Organic Matter %	Active Carbon mg C /kg	Soil Respiration mg CO2/g
Coarse	336	2.4 d	440 d	0.49 d
Loam	522	3.0 c	495 c	0.58 c
Silt Loam	544	3.5 b	533 b	0.68 b
Fine	54	4.3 a	686 a	0.78 a

New York Soil Health Characterization by Cropping System (Management)



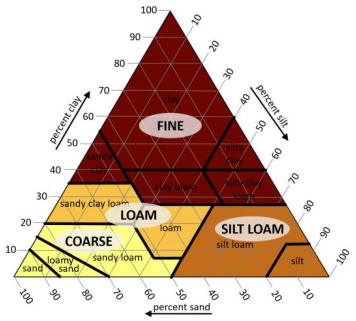


Soil Health Indicators by Cropping System (Management)

Cropping System	n	Organic Matter %	Active Carbon mg C /kg	Soil Resp mg CO2/g	Aggregate Stability %
Process Veg	106	2.7	487	0.47	27.4
Grain Crop	195	2.9	450	0.52	29.9
Dairy	116	3.4	608	0.60	35.8
Mixed Veg	86	3.9	575	0.58	43.7
Pasture	46	4.5	647	0.99	70.2

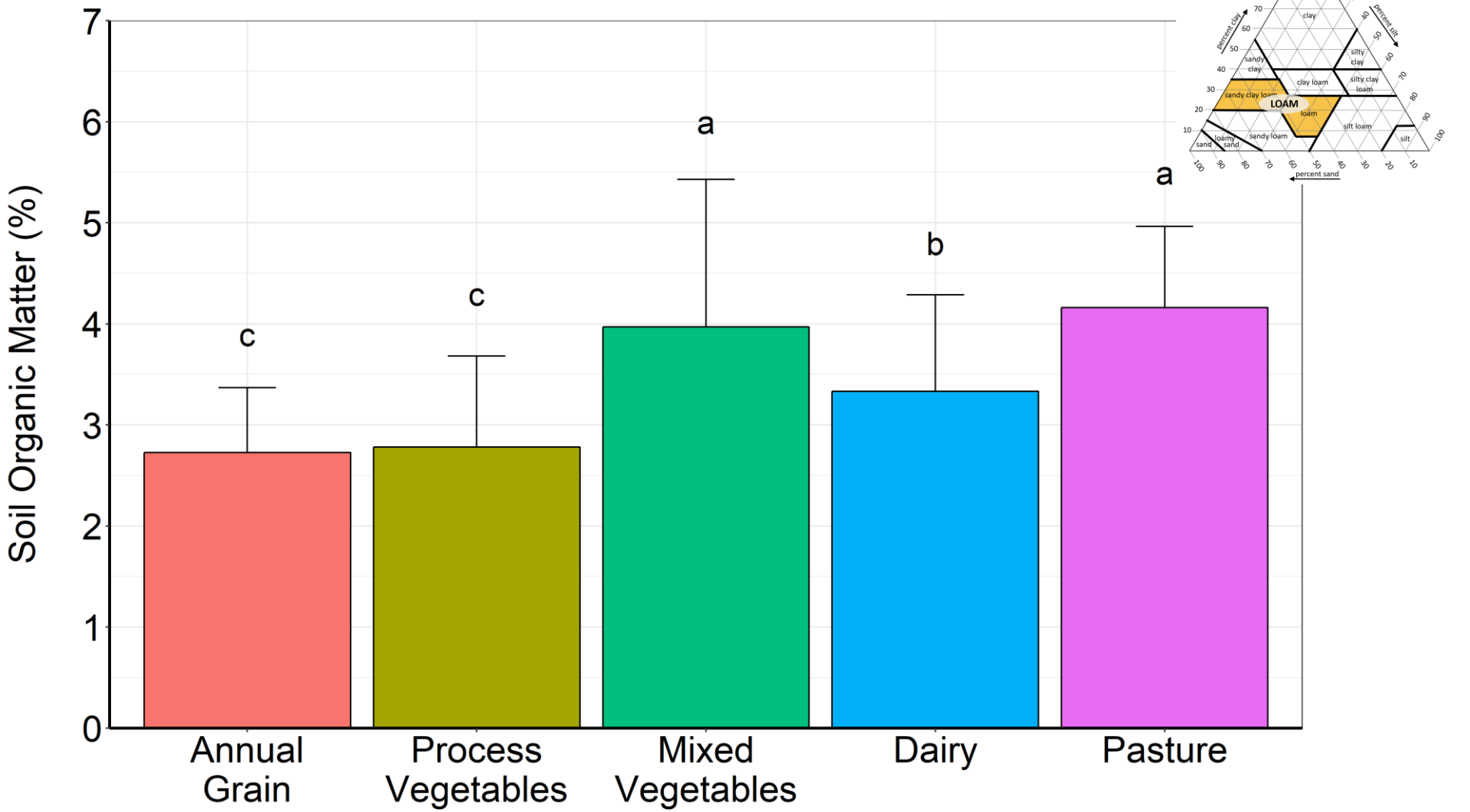
New York State Soil Health

Variance Components (%)

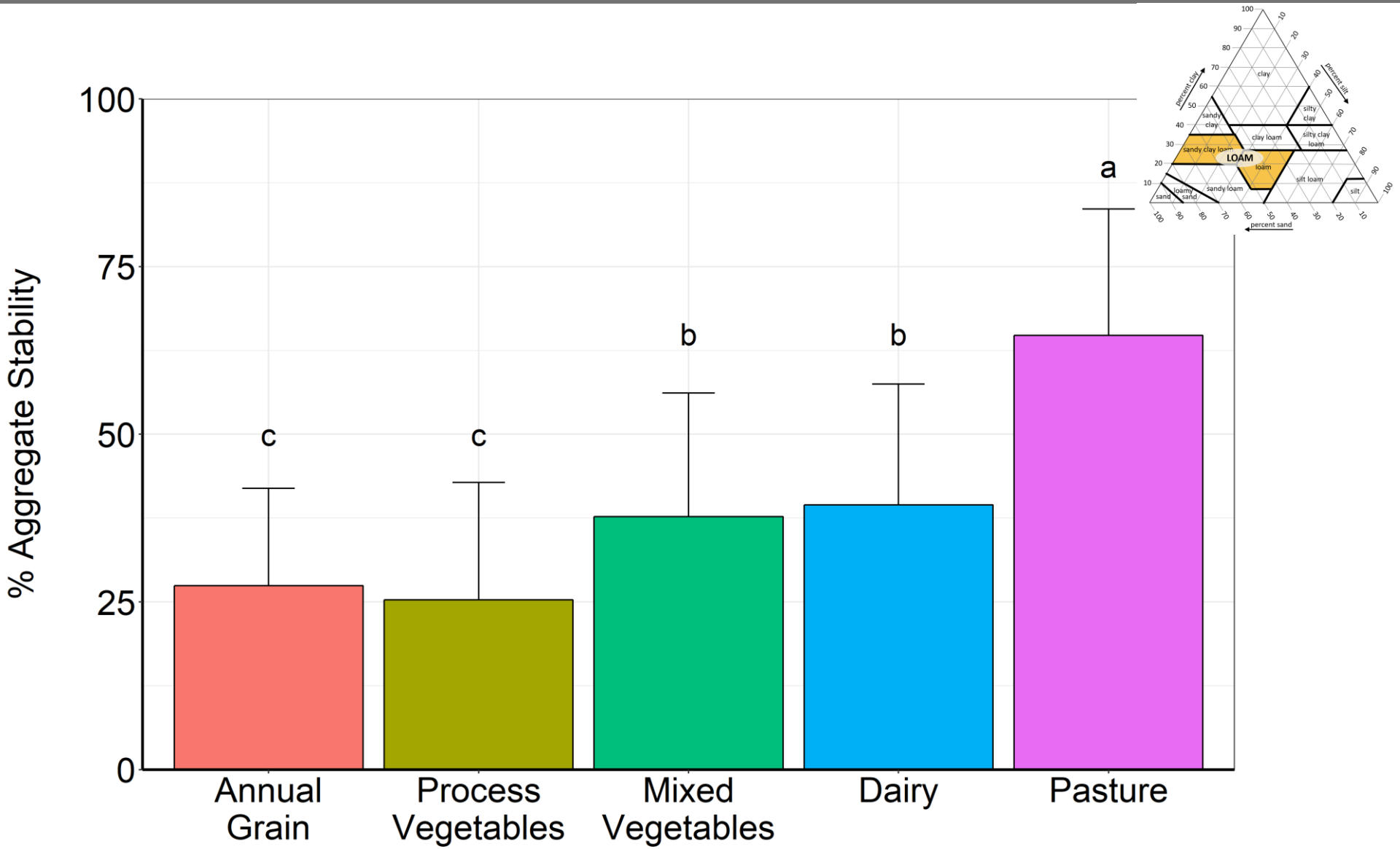


Var Component	SOM	ActC	Protein	Resp	AggStab	AWC
Texture Class	19%	9%	3%	4%	3%	35%
Cropping System	19%	12%	22%	30%	32%	6%
TC x CS	6%	1%	8%	9%	0%	2%
Error	56%	78%	67%	57%	64%	57%

Pastures and Mixed Vegetable Farms had the highest amount of SOM



Pastures have the highest wet aggregate stability



How can mixed veg improve?

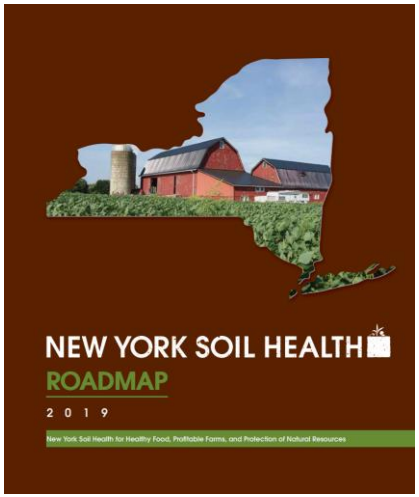
- Better aggregate stability
- Less disturbance
- Reduce tillage

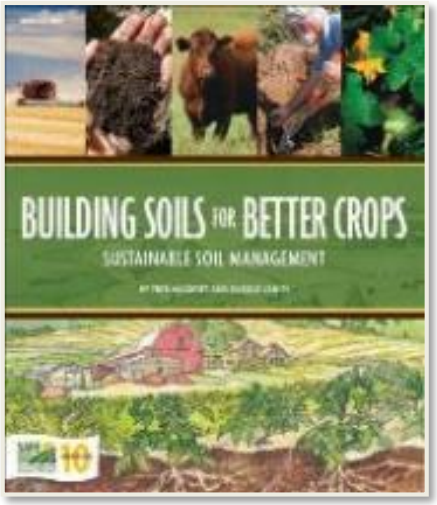
Aspirational Soil Health Goals by Cropping System (Q75 Basis for Loam Soils)

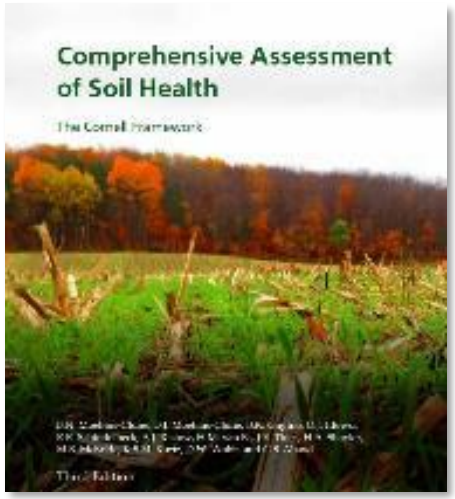
Cropping System	Organic Matter	Active Carbon	Soil Resp	Agg Stability
	%	mg C /kg	mg CO2/g	%
Process Veg	3.1	500	0.54	38
Grain Crop	3.2	600	0.58	36
Dairy Crop	3.7	680	0.71	50
Mixed Veg	4.9	740	0.75	50
Pasture	4.8	720	1.15	76

Thank you!

Resources available for free from our websites:







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