







Soil Erosion

- A Core of Engineers Study, based on a station in Avon, estimated that 1.5 million tons of soil sediment pass through the Genesee River each year.
- It takes one hundred years to build an inch of topsoil.




5 Principals of Soil Health

- Cover the soil at all times
- Root growth 24/7
- Diversified crop rotation and cover crops
- Reduce tillage: strip till and no-till
- Training



Forces of Rain

- Rain will travel approximately 32 feet per second.
- 1 inch of rain will provide 27,000 gallons or 108 tons of water per acre.
- As a result, topsoil and nutrients attached to the soil will move, especially if there is poor soil health and if not covered.
- **Water infiltration is essential.**





Thornapple Plots

- Planted April 20, harvested September 20, 12 inches rain (average 16 inches)
- From planting to end of July: 7 inches
- Greater than ½ inch: 4.57 in.
- Howard gravelly loam, well drained soils
- BMR Corn Silage

Interseeding Trials: 12.8/14.1

Plot	Yield 35% DM
Plot 1(check)	11.38
Plot 1 (cover)	13.95
Plot 2 (check)	12.87
Plot 2 (cover)	13.51
Plot 6 (check)	13.25
Plot 6 (cover)	13.91
Plot 7 (check)	13.70
Plot 7 (cover)	15.22

Post Harvest Cover Crops

Cover Crop	DM/ACRE	Nitrogen
Oats	.42	37
Oats/Peas	.27	23.7
Rye	.27	13.7
Black Oats	.35	19.1
Triticale, oats, annual grass	.25	18.4
Triticale	.34	20.4
Soil Builder 5 mixes	.37	25.9
Rays Fall Mix 9 mixes	.58	36.5
Annual Rye Grass	.46	17.4
Radish	.43	33.1
Rape/Radish	.43	24.5



Interseeding Drilled Cover Crop

Cover Crop	DM tons per acre	Nitrogen
Annual Rye Grass	2.34	130
Clover - Medium red	N/A	N/A
3 way Clover	N/A	N/A
Crimson Clover	N/A	N/A
Annual Rye Grass Clover Mix	2.05	131
Kings 6 way mix	3.7	232
6 way mix	.9	60
5 way mix	2.5	148
Pea Soy Millet	N/A	N/A



2012-2016 Silage Yield and Quality by Day Length

Day Length	Number of Varieties	Yield 30% DM	DM	DNDF
88-91	47	23.5	38.8	59
92-99	63	24.7	40.2	63.3
95 - 99 BMR	7	22.7	33.4	69.7
101-111	65	23.6	34.7	61.3
105 -109 BMR	6	22.2	29.9	68.7

available at our website: WNYCMA.COM



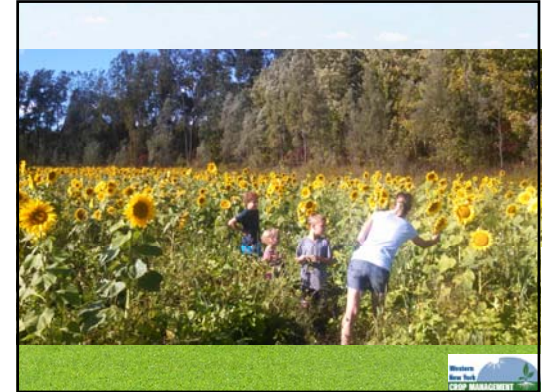
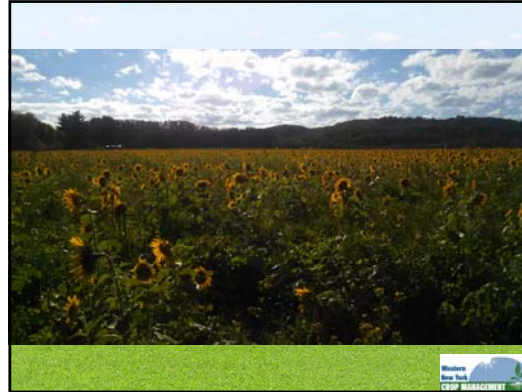
9/7/2016, Oats 36 lbs., Rye 16 lbs., and Tillage Radish 2 lbs.



Above Ground Diversity = Below Ground Diversity

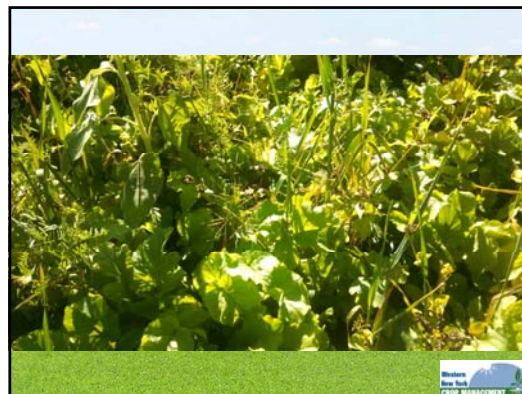
- Cover crop mixes: Mono culture rate/ number of cc species +1
- For example
 - Monoculture rates: 90 pounds oats, 120 pounds cereal rye, 10 pounds tillage radish
 - Mix rate: 23 pounds oats, 30 pounds cereal rye, and 2 pounds tillage radish
- Following spring, plant green
- Save on cost; less is better





Edelweiss Farm Cover Crop Mix

- Oats: 32 pounds
- Red clover: 4 pounds
- Tillage Radish: 2 pounds
- Buckwheat: 4 pounds
- Vetch: 4 pounds
- Sunflower: 3 pounds

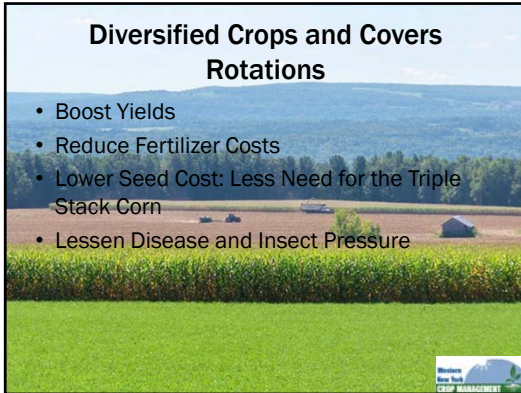


Diversified Crop Rotations Versus Continuous Corn: Penn State Trial

- 7% higher yield on soy/corn rotation
- 15% more yield in 1st year corn, 10% higher yield in 2nd year from sod
- 16% higher yield following oats/wheat, red clover cover

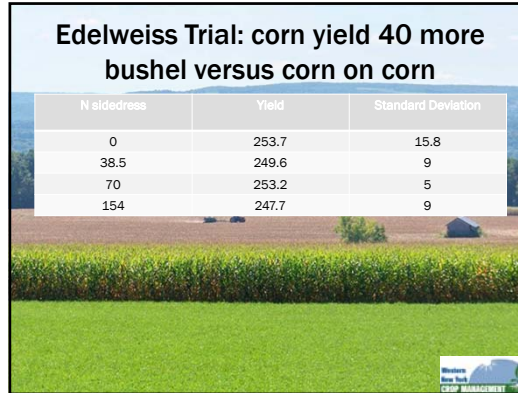
Diversified Crops and Covers Rotations

- Boost Yields
- Reduce Fertilizer Costs
- Lower Seed Cost: Less Need for the Triple Stack Corn
- Lessen Disease and Insect Pressure



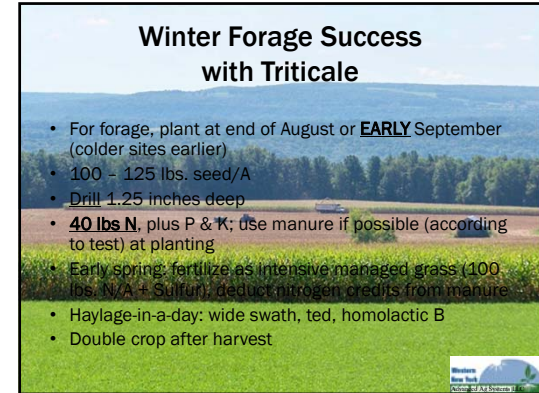
Edelweiss Trial: corn yield 40 more bushel versus corn on corn

N sidedress	Yield	Standard Deviation
0	253.7	15.8
38.5	249.6	9
70	253.2	5
154	247.7	9



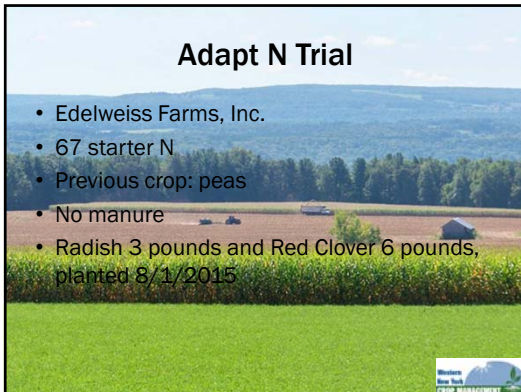
Winter Forage Success with Triticale

- For forage, plant at end of August or **EARLY** September (colder sites earlier)
- 100 - 125 lbs. seed/A
- Drill 1.25 inches deep
- **40 lbs N**, plus P & K; use manure if possible (according to test) at planting
- Early spring: fertilize as intensive managed grass (100 lbs. N/A + Sulfur); deduct nitrogen credits from manure
- Haylage-in-a-day: wide swath, ted, homolactic B
- Double crop after harvest



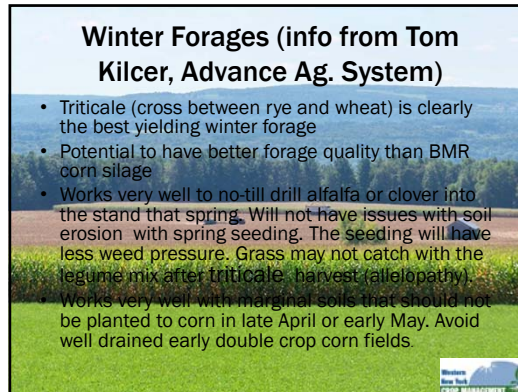
Adapt N Trial

- Edelweiss Farms, Inc.
- 67 starter N
- Previous crop: peas
- No manure
- Radish 3 pounds and Red Clover 6 pounds, planted 8/1/2015



Winter Forages (info from Tom Kilcer, Advance Ag. System)

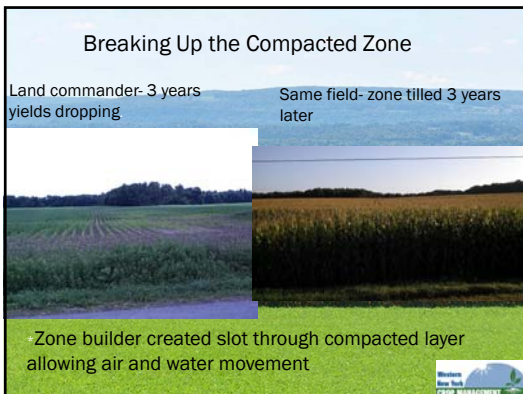
- Triticale (cross between rye and wheat) is clearly the best yielding winter forage
- Potential to have better forage quality than BMR corn silage
- Works very well to no-till drill alfalfa or clover into the stand that spring. Will not have issues with soil erosion with spring seeding. The seeding will have less weed pressure. Grass may not catch with the legume mix after triticale harvest (allelopathy).
- Works very well with marginal soils that should not be planted to corn in late April or early May. Avoid well drained early double crop corn fields.





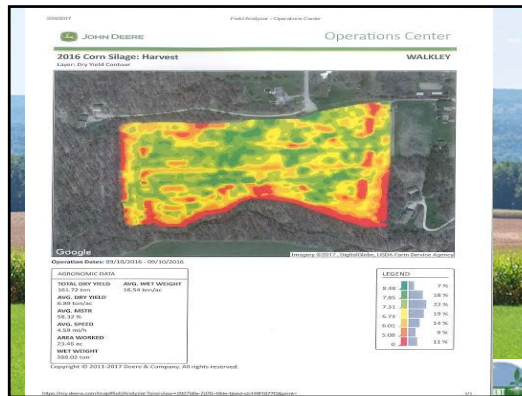
Define Forage Production Needs and Quality

- Assess livestock needs and production plan to meet the needs based on the soil resource.
- Profit team meetings with the farm's key players: crop consultant, nutritionist, vet, & banker
- Annual budget for tile!



Tile System





Five Year Plan

- Measure yields with the forage chopper and/or scales
- Costs: fixed and variable
- Return?
- Crop and rotation plan for the next 5 years based on soil types, erosion control and forage needs
- **Build your Soil Health Foundation!**

