

Comparing 2003-2010 changes in soil quality test results in adjacent conventionally (8) and organically (24) managed Coastal Plain soils field plots.						
	2003	2005	2006	2007	2009	2010
	<i>RU Soil Lab</i>	<i>RU Soil Lab</i>	<i>UDel Soil Lab</i>	<i>UDel Soil Lab</i>	<i>UDel Soil Lab</i>	<i>UDel Soil Lab</i>
Conventional Fields 5, 10, 11, 15						
pH	n/a	6.4	6.4	6.6	6.8	6.4
OM (%)	1.3	1.3	1.2	1.7	2.4	2.3
CEC (meq)	3.5	3.4	5.2	n/a	6.8	6.6
Conventional Fields 20, 21, 24, 25						
pH	6.6	6.5	6.6	6.2	6.9	5.9
OM (%)	1.6	1.6	1.6	2.0	1.9	2.2
CEC (meq)	3.9	4.0	5.8	n/a	6.4	5.8
Organic Fields 4, 8, 9, 13						
pH	n/a	6.6	6.3	6.6	7.0	6.6
OM (%)	1.4	1.2	1.4	1.9	2.7	2.3
CEC (meq)	3.4	3.4	5.1	n/a	7.8	7.1
Organic Fields 18, 22, 23, 28						
pH	6.6	6.4	6.6	6.4	6.9	6.0
OM (%)	1.7	1.5	1.6	2.1	1.8	2.0
CEC (meq)	3.6	3.5	5.2	n/a	6.0	5.4
Organic Fields 1, 3, 14, 16						
pH	n/a	6.9	6.4	6.6	6.9	6.4
OM (%)	1.6	1.4	1.5	1.8	2.4	2.5
CEC (meq)	4.1	3.7	5.6	n/a	7.4	7.5
Organic Fields 17, 19, 29, 32						
pH	6.6	6.4	6.6	6.4	6.9	6.2
OM (%)	1.6	1.5	1.5	1.8	1.7	1.9
CEC (meq)	3.6	3.3	4.8	n/a	5.4	5.1
Organic Fields 2, 6, 7, 12						
pH	n/a	6.5	6.5	6.4	6.9	6.5
OM (%)	1.5	1.3	1.2	1.7	2.6	2.7
CEC (meq)	3.9	3.8	5.7	n/a	7.8	8.0
Organic Fields 26, 27, 30, 31						
pH	6.7	6.4	6.6	6.3	7.0	6.3
OM (%)	1.6	1.5	1.6	1.9	1.9	2.0
CEC (meq)	3.8	3.6	5.5	n/a	5.9	5.3

This on-farm demonstration, funded by USDA NE-SARE funds, had its training goal to determine if potentially profitable, but depleted, coarse Coastal Plain soils, typical of those available and affordable to new, beginning, alternative, or transitional organic farmers in our region, and under previous mediocre management, could meet the economic sustainability challenge of cash cropping most seasons, with existing equipment, growing organic livestock feeds and forages, while also advancing soil health parameters over time.

Coarse coastal Plain soils are normally associated with acidic condition, oxidizing OM, and difficulty maintaining or raising soil quality, while still cash cropping fields most seasons. This data set confirms meeting both cash cropping and soil health sustainability challenges are possible.

All 32 field plots (8 conventional and 24 organic) received similar cropping intensity, rotations, and cover crop practices, varying only in herbicide use, variety selection, and tillage practices between conventional and organic production. **Soils in eight conventionally managed field plots began at 1.3-1.6% OM and advanced to 2.2-2.3% OM over the period. Soil in sixteen organically managed field plots began at 1.4-1.6% OM and advanced to 1.9-2.7% OM.**

Thus, during this 2003-2010 cropping period, both conventional and organic field plots realized similar advances in Soil OM (%) and CEC (meq/100g) as basic measures of soil health and quality. Results provide confidence that conventional growers, who modify their rotation and cover cropping practices on these coarse Coastal Plain soils, will realize measurable advances in basic soil quality parameters indistinguishable from organic production methods. The rotations and cover cropping patterns provide advances in soil health, not whether the fields are managed under conventional or organic systems.

Soil test results (range of 4 samples) from adjacent, undisturbed, uncultivated, similar soil types, under native forest cover. Performed 2010 UDel Soil Lab	
pH	Range from 4.0 - 4.3
OM (%)	Range from 3.4 - 6.0
CEC (meq)	Range from 7.5 - 8.5

The above soil tests were performed as an outcome from questions raised by NJ-NRCS-USDA colleagues regarding, “What is the potential upper limit of soil quality improvements possible on these Coastal Plain soils?” Fortunately, we had adjacent access to the same soil time under native forest cover. While the pH is too low for agriculture, the Buffer pH range was 7.01 – 7.12. Our cultivated field CECs are already near these results, but soil organic matter percent has room for further gains.

Fields are located at the intersection of County Route 540 and Polk Lane at Rutgers Agricultural Research & Extension Center Farm. Organic fields were transitional from 2003-2005, and USDA NOP Certified Organic from 2006. Visits to fields and detailed data on cropping, rotations, and cover crops available upon request, and will be published on the web in 2010.

By: David L. Lee, Jack Rabin, Marie Banasiak, Jason Berkowitz, Roger Jany, GrowMark FS, Mike Marandola, Pioneer HiBred Int'l, Kris Smolenski, Rutgers Agricultural Research & Extension Center Farm

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