



ORGANIC CROPPING AND GRAZING SYSTEMS TRIALS

Introductory Research Report E2007-21

BACKGROUND

A fundamental tenet of organic agriculture is that more integrated and 'substrate diverse' production systems, built around excellence in agronomy, can yield benefits with respect to soil organic carbon (SOC) sequestration and nutrient efficiency, improved soil quality and biodiversity, and reduced impacts on air and water quality. Data to support this hypothesis is extremely limited, however. Long-term organic cropping or livestock systems trials are lacking, particularly in Eastern Canada, or are not designed to quantify impacts on water quality. The reliance on soil mineralization, N₂ fixation, livestock wastes, and un-acidulated mineral inputs presents specific research challenges for efficient management of nitrogen (N) and phosphorous (P) in organic systems.

CROPPING SYSTEM TRIALS

Replicated cropping systems trials have been established in 2006 at the Nova Scotia Agricultural College (NSAC) in Truro, NS to:

1. Examine the relationship between organic farming system productivity and resource efficiency;
2. Gauge the impact of reliance in organic cropping and livestock systems on green manures and organic amendments on air and water quality; and
3. Examine the relationship between soil health and crop quality.

These activities are expected to also contribute to development of innovative management technologies for organic vegetable (carrot, broccoli, beans, and potato) production.

GRAZING SYSTEM TRIALS

Access to pasture is a requirement of organic livestock management standards. A parallel research facility being established in 2007 will examine the effect of grazing management on soil, livestock, forage and water quality. This novel research site will utilize a replicated, tile-drained and instrumented cropping systems research site, and isotopic techniques, to gauge the impact of livestock/grazing management systems on livestock and forage productivity, SOC and water quality. The OACC/Brookside facility of NSAC is currently used for grazing studies and provides a corral and weigh scale. The experimental design will be a split-plot randomized complete block design with four replicates imposed on 20 hydrologically isolated (tile-drained) paddocks/plots, each fully instrumented with automated water samplers and tipping bucket gauges.

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