

## Farmer-led Research Program Summary 2016

***It was a hard year to be a farmer and a hard year to be a farmer-researcher.*** The hot and dry conditions stymied a few of the planned experiments. Fortunately, Paul DeJong, Ken Laing and Tony McQuail successfully collected soil for the soil health test - just around first-cut hay before the drought really took hold -, and Jason Hayes collected intriguing data for the first replicate of a pastured poultry trial. And despite the weather, we all learned a lot about experimental design, the commitment required to conduct trials and the potential for farmer-led research to make **CHANGE GROUNDED IN FARMER KNOWLEDGE.**

Below is a brief summary of the experiments and results-to-date. Protocols are available now and final results will be published as Research Reports in early 2017 in the new online Research Library: [efao.ca/research-library](http://efao.ca/research-library). Contact Sarah ([sarah@efao.ca](mailto:sarah@efao.ca)) with questions or to share your research needs, ideas and ambitions!

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### Biological soil health tests: Are they worth it?

**Farmer-researchers:** Paul DeJong, Ken Laing and Tony McQuail

#### Summary

- New soil tests measure aspects of soil biology and, therefore, are thought to be better indicators of overall soil function and health.
- The practical value of these soil health tests is still unclear because they are expensive and we lack information on the most effective tests to use to compare short- and long-term changes in land management.
- To assess the effectiveness of different soil health tests to detect changes in land management on ecological farms, Paul, Ken and Tony took replicate soil samples from high- and low production fields and a fence row for reference.
- Soil from all three farms was analyzed for 1) the Haney Test, which includes organic matter, potential mineralizable N, nitrate, ammonium and inorganic P, soil respiration, 2) active C, 3) aggregate stability; soil from Ken's farm was also analyzed for 4) phospholipid fatty acids.

#### Key Findings

- Active C, nitrate and inorganic P all reproducibly distinguished among fields on each farm; active C was also consistent in its ranking of fields on all farms, making it the single best test to discern differences in soil health on the ecological farms in this study.
- Wet aggregate stability, Solvita® CO<sub>2</sub>, potential N mineralization, water extractable organic C, N and C:N, Haney's soil health calculation and ammonium were not consistently sensitive or reproducible.
- Soil organic matter was reproducible and sensitive, but not to small differences (i.e. <0.5 %OM).
- Phospholipid fatty acid analysis produced sensitive and reproducible differences in the total biomass of various bacterial and fungal groups but not in overall community composition (i.e. % biomass), which is better associated with soil function; therefore, this test is recommended when there are specific management goals related to the microbial biomass or to detect larger differences in composition.

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### Quick turnaround cover crops before late season brassicas

**Farmer-researchers:** Kevin Hamilton, Angie Koch, Ken Laing, Mike Reid and Ryan Thiessen

#### Summary

- Organic vegetable growers use cover crops to improve soil fertility and tilth and control weeds.
- Five growers evaluated summer cover crops to determine benefits to N-demanding late season brassicas.
- Specific cover crop comparisons included bell/fava bean (legume) vs. no cover crop control; cocktails containing a legume (bell/fava bean, peas, white clover) vs. buckwheat control.

#### Key Findings

- Dry conditions in the spring impeded germination resulting in "lacklustre growth [that was] not nearly competitive enough to deter weeds" or mature enough to effectively mow, resulting in very little meaningful cover crop or brassicas yield data.
- Buckwheat came up better than other species, making it the most drought tolerant of the species grown; at Angie's, buckwheat had 6+ times greater biomass than the oats/peas/fava cocktail (P<0.01).

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### Pasture-raised chicken comparison

**Farmer-researchers:** Jason Hayes and Drake Larsen

#### Summary

- The Nova Free Ranger is a new meat chicken from Nova Scotia derived from European heritage breeds.
- Since it is bred for free range living, it is thought the Nova Free Rangers will perform better on pasture than the industrial White Rock – Cornish Cross.
- But given the fast growth rates of White Rocks, Nova Free Rangers may take longer to grow and, therefore, require more feed and labour.
- Jason Hayes and Drake Larsen raised groups of Nova Free Ranger and White Rock chickens on pasture and measured feed intake, carcass yield, taste and nutritional quality.

#### Key findings

- From one successful replicate, the Nova Free Ranger group had lower (better) average feed conversion ratio.
- Blind taste tests suggest the taste and texture of Nova Free Ranger meat is preferred by culinary professionals but non-chef customers may prefer the smoother texture of White Rock meat.
- Nutritional analysis is pending.
- Delayed shipment of Nova Free Ranger chicks prevented replicate trials in 2016, *so additional replicates are needed in order to draw conclusions.*

## Other experiments

### Efficacy of foliar spray for organic vegetables

**Farmer-researcher:** Angie Koch

#### Summary

- It was simply too hot to spray as often as usual for fear of burning the plants. Angie is considering conducting the experiment in 2017 for a single crop (perhaps tomatoes) only.

### Fertility amendments for pasture improvement

**Farmer-researcher:** Tony McQuail

#### Summary

- While he was able to apply the amendments (sulphate of potash, zinc sulphate, copper sulphate and boron), the drought delayed Tony's sampling until spring 2017 because pasture growth stalled.

### Nutritional differences between local/imported organic and conventional veggies

**Farmer-researcher:** Tony Neale

#### Summary

- Tony opted to delay sampling nutritional quality of vegetables until next year out of concern for the drought's effect on plant stress.

### Fall cover crops for vegetable production

**Farmer-researchers:** Sally Knight and Shannon Lee

#### Summary

- Recognizing the importance of diversity for soil fertility, Sally wants to expand her cover crop repertoire beyond oats, peas and buckwheat so she compared biomass of rye/vetch and oats/vetch cover crops in all raised beds.
- Shannon compared drilling vs. broadcast seeding a fall cover crop for control of thistles.
- Final data collection for spring 2017, where applicable.