Experimental Acres

2025 Project Outcomes

GREY AGRICULTURAL SERVICES

Dufferin county

In This Report

What is Experimental Acres?

The Experimental Acres program supports farmer-led discovery of new practices to build soil health and enhance carbon recapture. The program offers a de-risked learning season for testing best management practices to build a business case, support scaling, and link to larger funding opportunities. Experimental Acres supports projects through 3 funding streams:

- Living Roots and Green Cover
- Innovation
- Integrating Animals on the Farm

The Experimental Acres program was developed as a part of Guelph-Wellington's Our Food Future project, funded by Infrastructure Canada. The County of Wellington facilitated the program in Wellington and Dufferin Counties in 2022, and Grey County joined in 2023. The 2024 and 2025 programs have been administered by Grey Agricultural Services on Dufferin County's behalf.

Experimental Acres is funded by the County of Dufferin in alignment with local climate commitments. The program delivers on the priorities in the Dufferin Climate Action Plan and Dufferin Climate Adaptation Strategy to "increase uptake of regenerative agriculture practices in partnership with farmers to increase soil organic matter, reduce erosion, and improve water security".

Examples of past projects have included cover cropping, silvopasture, rotational grazing systems, tarping to avoid tillage, intercropping, livestock bedding trials, vertical farming, no-till establishment of crops, companion planting, use of drone technology, novel soil amendments, construction of a net-zero greenhouse and many more.

Projects are designed by the producer and can involve trialing an established practice that is new to the farm, or implementing an idea which has never been attempted. Projects are selected through an application process based on their alignment with program goals.

The 2025 Program

In 2025, three farms received support to conduct Experimental Acres trials. Trials included the creation of a natural pesticide from rhubarb leaf ferment, the use of ducks to suppress vegetation around saplings, and the implementation of an espalier growing style on a fruit and nut orchard.

Projects were selected in March, and trials began with the growing season in May. Monitoring was carried out over the summer to note progress of the projects. Each trial was evaluated based on the farmers' goals, including considerations such as practicality of implementation and economic viability, both of which are integral to further adoption over larger acreages. Monitoring included lab analyses, visual observation, comparison to control areas, and soil nutrient testing.

Why Sustainable Agriculture?

Dufferin County has a rich natural heritage and vibrant agricultural community. Land in Dufferin County is classified as 70% prime agricultural land and the County boasts 690 farms covering 156,593 acres.

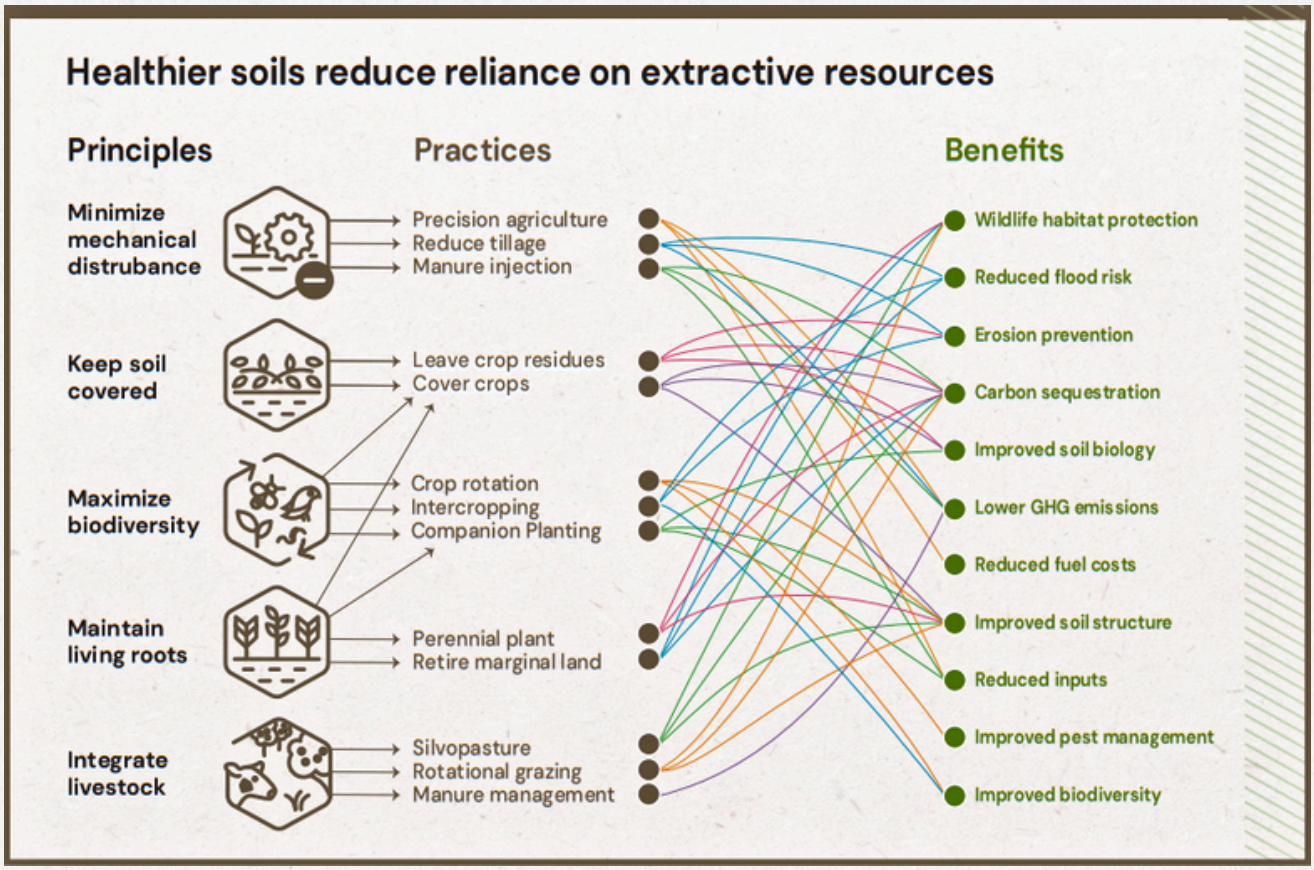
Agriculture is one of the few industries that has the ability, with conscientious sustainable practice, to sequester carbon from the atmosphere back into the soil. Stewardship practices which target soil health have the potential to improve farm ecosystems' ability to store carbon. Practices which reduce tillage, maintain soil cover and living root stems year-round, or enhance soil biodiversity create a more robust agricultural system with greater ability to transform atmospheric carbon into storable nutrients and deposit them in the soil. These practices have a host of other environmental and economic benefits as well. Healthy, well managed soils have improved water infiltration rates, are less prone to erosion, and are more productive. There is no downside to investing in good soil management practices and the benefits can ripple out to improve farm health (physical and financial), the environment, and by means of those two, the community around them!

Experimental Acres funds projects which support carbon sequestration and the reduction of carbon emissions in addition to soil building. Sustainability incorporates all parts of a system, so projects such as finding alternate feed sources for livestock, diverting waste into other uses, or implementing green technology also fall into the parameters of the program.

Experimental Acres kickstarts a community of practice where innovative solutions are explored to the benefit of all.

While projects carried out on farm have a direct impact on farm practices, they also create a ripple effect for the surrounding agricultural community. Ideas carried out by one producer can be tweaked to fit a neighbour's farm. Discussing the outcome of a trial can inspire a friend to create their own.

The graphic below was taken from Wellington's County's Experimental Acres Handbook and provides a good example of the many benefits of various practices.



Source: Principles, Practices, and Benefits of Sustainable Agriculture. Wellington County's Experimental Acres Handbook (2023).

Methods

Below are examples of several monitoring methods for the progress of Experimental Acres projects These are in addition to nutrient analysis, visual monitoring, and comparison of economics or practical application of projects. Participants design their own plan for monitoring, with input from program coordinators, to align with the project type and desired outcomes.

Infiltration Testing

Water infiltration testing involves pounding a steel ring partially into the ground and pouring a measured amount of water into the ring. The time that it takes water to infiltrate is recorded as an indicator of the porosity and water holding capacity of the soil. The more "sponge-like" the soil is, the better. Soil that can hold more water will be less prone to erosion.

Tracking infiltration rates over time helps develop an understanding of soil changes, but no single rate indicates good or bad soil health. A heavy rainfall the night before testing would change data entirely from a test done in the same spot after a week of dry weather. Comparing the results of a test and control area taken on the same day, and repeating those tests over time, can give a better idea of whether infiltration stays the same, or whether a trial's "treatment" is having an impact.

Soil Testing

Soil testing is another tool for Experimental Acres trials in which soil samples are sent to laboratories for analysis. Not all changes can be seen in one growing season. When tracking nutrients for a regular soil fertility program, sampling once every three years is the standard practice. This interval is enough time to see changes in nutrient profiles and adapt fertilizer applications to match them.

For Experimental Acres, soil testing helped to develop a baseline that farmers can build on in years ahead. Some projects looked specifically at soil fertility and had several soil samples taken throughout the season.

Knowing the nutrients available in soil is a crucial step in making good stewardship decisions and an important best management practice.

Compaction Testing

Compaction is a major challenge to soil health, particularly on farms where large equipment is used, fields are crossed frequently, crossed in wet conditions, and/or a lot of tillage is practiced.

Compacted soil has fewer air and water pockets, leaving it less capacity to absorb water. It is also more difficult for plant roots to penetrate, therefore less productive.

A penetrometer was used to monitor compaction in Experimental Acres projects. It measures the pressure needed to push a probe into the soil and allows that pressure to be gauged at varying soil depths. The penetrometer helped us understand compaction at the beginning of the trials, look at how different practices affect the soil, and plan future practices accordingly.

Hockley Hank Farm & Garden orchard in October 2025.

Hockley Hank Farm & Garden

Henry van Oudenaren

Implementation of Espalier Growing Style

Henry's project applied an espalier growing method to a wide variety of fruit and nut trees and bushes. Espalier uses stakes and wire to create a trellis which plants are trained to grow along. Plants are pruned and branches are tied to the wire to maintain a two dimensional shape at a manageable height.

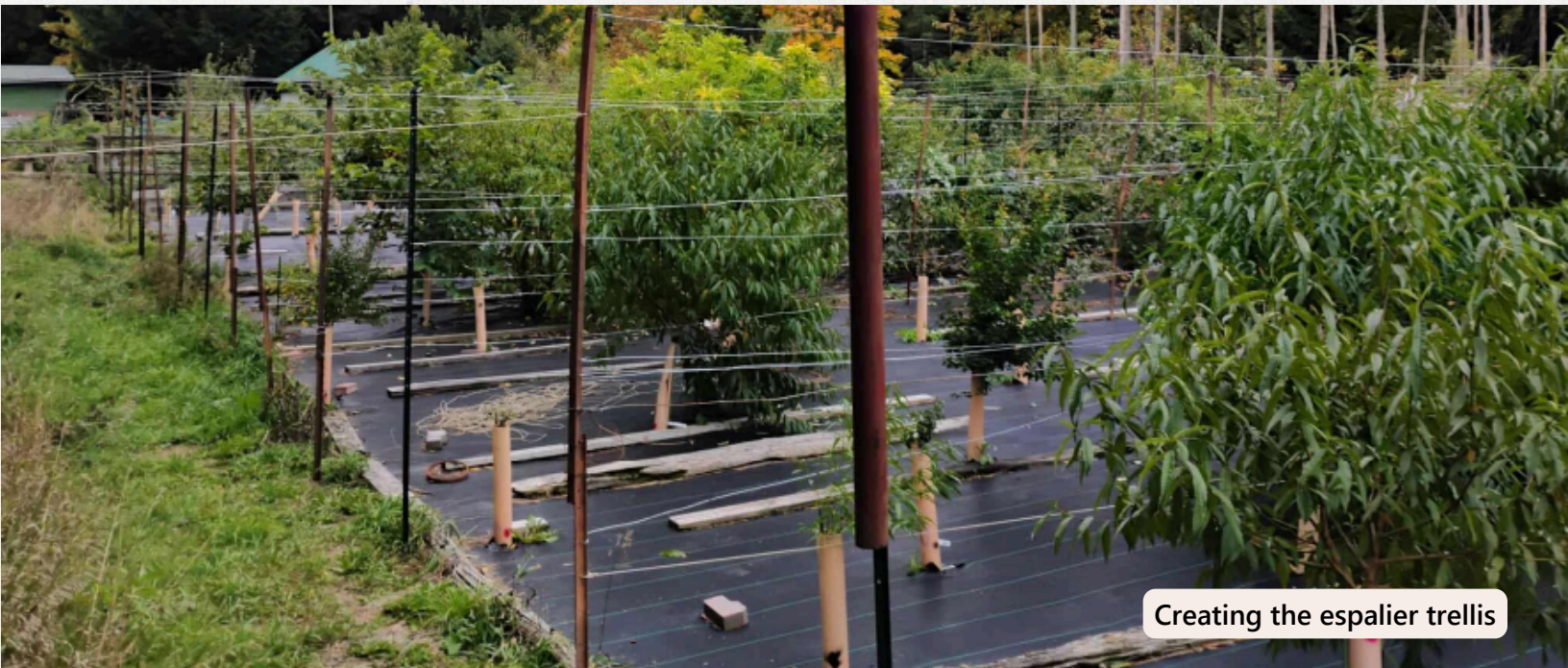
The project's goals include maximizing the density of the orchard and eliminating the need for mechanical harvest by keeping all produce easily within reach. Increasing the density of plants grown in an area also increases the level of food production from that acreage. With a reduction in need for fossil fuels, products are grown more efficiently and on a smaller carbon footprint. Other benefits to the system include increased resiliency of the plants - if Henry is successful in growing a wide variety of species in one espalier orchard system, the amount of biodiversity should provide benefits such as reduced pest pressure or complimentary nutrient cycling/fixing where some plants deposit nutrients into the soil which others can then use. He also hopes that the density and the trellis system will make foraging more difficult for animals like deer and will provide protection from high winds and poor weather as well.

Included in the orchard are 49 types of fruit trees and bushes (spanning 253 different varieties), and 36 varieties of nuts. The trial was the start of what will be a long term experiment looking at how each plant adapts to an espalier style of growing, and evaluating production. Henry has records of harvest weights to date and will continue to monitor in the future.

The orchard in July 2025, prior to wire being added.

Rows were placed five feet apart, with plants roughly every six feet along the row. Henry intends to have 450 plants managed in the espalier style as a result of this project. The entire orchard uses commercial grade ground cover to eliminate the need for mowing or weeding, again reducing the amount of fossil fuels necessary for management of the trees. Henry has found that the ground cover is also effective at preventing evaporation of moisture from the soil, reducing the need for watering, and potentially increasing resiliency during droughts. One concern he had with the black ground cover was whether it would raise the temperature of the soil beneath it to a point that was damaging for the roots of young growing plants. He experimented with planting pumpkins and squash at the base of trees, allowing them to sprawl throughout the orchard and create shade. He was very pleased with the health of the plants and additional produce created in doing so.

While it will take several years to evaluate the outcome of applying this growing method to each of the plants used, Henry did note other positive aspects of his mixed orchard. Most notably, he is very happy with the quality of fruit being produced so far, noting that they haven't seen any pest or disease pressure so far, potentially a result of the high level of biodiversity.



Creating the espalier trellis

Brilliant Meadow Farm

Shiying Lu

Using Ducks to Suppress Vegetation Around Saplings

Shiying created a “duck taskforce” to suppress grass growth around newly planted saplings. Shiying noted that with limited time available for projects on the farm, tree plantings tend to be neglected, as mowing the grass around them would be beneficial for the young trees, but is impractical to accomplish on a regular basis. In addition to reducing workload, having livestock suppresses grass growth and eliminates the need for fossil fuel use in mowing. The addition of manure also adds nutrients to the soil, supporting soil microbial populations which increase biodiversity, and improves the health of the young trees.

Ducks were chosen for their rounded bills and reduced likelihood of causing damage to the saplings. Portable electric net fencing and a small coop were used to house the birds in a grassy area where fruit saplings were being established.

Four ducks were quite effective at trampling grass in an area enclosed by a 164' perimeter fence. There was a very obvious difference between the ducks’ area and the space where they were not. Without the ducks, grasses grew densely enough to make it difficult to find saplings.

Unfortunately the trial had to be cut short when predation became an issue. Shiying found that the ducks were extremely difficult to herd into their indoor enclosure each night and the fencing was not enough deterrent to keep predators out.

Area where ducks suppressed plants around trees.

Area with tree saplings but no ducks for comparison.

Lennox Farm

Brian and Jeanette French

Creation of a Natural Pesticide from Rhubarb Leaf Ferment

Lennox Farms is one of the largest rhubarb growers in North America, and produces a wide variety of other vegetable crops as well. The Frenches used rhubarb leaves, a byproduct of their crop, to attempt to create a pesticide which could be applied to other vegetables on the farm. Their goal was to take a waste product and create a useful, all-natural solution which would support healthier growth of other plants. This innovation would add value to rhubarb leaves which are otherwise simply composted, and potentially eliminate the need for purchased pesticide use.

The product was created by producing a rhubarb leaf and water mixture in a steam kettle before adding it to a large tank along with water and molasses. The tank was placed in a greenhouse to allow fermentation to occur and monitored for changes over time.

Between June 1st and 28th the pH of the tank mixture dropped from 5.5 to 3, it underwent a colour change, scent change and formed bubbles. On June 28th broccoli and cauliflower were planted into a 100' bed and monitoring began, carried out by their daughter, Kayleigh. The broccoli/cauliflower crop was chosen because they typically see high pest pressure for both plants on the farm. Approximately ⅔ of the plants were broccoli and ⅓ were cauliflower. The bed was split into four sections: two control sections and two treatment sections. One of the treatment sections received a single rate of spray each week, while the other received twice the rate. Beds were weeded weekly and observations were recorded at that time as well.

Results
Weekly monitoring noted changes in growth, colour and insect pressure amongst all of the sections for the months of July and August as well as a final observation of the plants in October.

No difference in insect pressure was noted between the sprayed and control sections. Interestingly, the sprayed sections showed better growth throughout most of the season, with the section receiving the double rate of spray growing the most. Altogether a very hot, dry summer, with little to no rain for several weeks in August stunted the entire crop.

Aside from visual monitoring of the crop, the Frenches also conducted regular pH testing of the mixture and had analyses completed on the nutrient values and the microbial populations present in the product.

Other Applications
Given the low pH of the product, the Frenches also experimented with using it as a pH reducer for drip lines in their tomato greenhouses which proved to be extremely effective. Jeanette also noted that she used it at full strength for an ant problem they had and it was effective with that. These successes, coupled with the increase in growth noted in the broccoli and cauliflower plots, leave them quite excited for further experimentation in the coming year.

The trial plot of broccoli, with labels for replicates


Brian & Jeanette with a tote of fermented product

Contact Grey Ag Services for more information: 519-986-3756 info@greyagservices.ca

Alternate formats available upon request.