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### Field to Fork Farm: Resilience through Diversification

Ravdeep Jaidka

*University of New Hampshire*

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## Field to Fork Farm: Resilience through Diversification

Field to Fork Farm's name is derived from the literal sense of the phrase. Operated by Patrick and Daniela Connelly in Chester, New Hampshire, the farm started out of an intention to be self-subsistent and grow as much food as possible for their family. A decade later, the farm is a productive, diversified operation.

### Production

On this expansive, 77-acre farm, Patrick and Daniela grow an abundance of fruits and vegetables, such as peaches, apples, plums, onions, potatoes, and garlic. The high tunnel, an unheated greenhouse, grows tomatoes, peppers, and eggplants and allows the farm to extend its growing season. In addition to a bounty of fruits and vegetables, the farm is a fully diversified livestock operation. The farm raises around 600 broilers a year and is home to 16 pigs, 11 goats, and 11 cattle. Lastly, the farm also raises honeybees for pollination and honey. While the fruits and vegetables are mostly for self-subsistence, the farm's meat Community Supported Agriculture (CSA) supplies 90% of its revenue. The farm also sells eggs, milk, honey, and maple syrup tapped right on site and sold directly to customers.

*Diversified farming is a more sustainable form of agriculture that relies primarily on inputs generated and regenerated within the agro-ecosystem, rather than primarily on external, nonrenewable, inputs (2, 3).*



**FIGURE 1:** Field to Fork Farm is a 77-acre diversified operation growing and raising fruits, vegetables, pastured meat, eggs, honey, and maple syrup.

### Defining Diversification

A diversified farming system is defined as “farming practices and landscapes that intentionally include functional biodiversity at multiple spatial and/or landscape scales in order to maintain ecosystem services that provide critical inputs to agriculture, such as soil fertility, pest and disease control, water use efficiency, and pollination” (1). Diversification is the antithesis to monoculture, or the practice of growing a single crop in a given area. An example of monoculture is the extensive acres of corn and soybean that have become the hallmark of Midwestern agriculture. Diversification is an agro-ecological alternative to industrial agricultural practices.

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A large number of farms in New England are diversified operations. Field to Fork Farm made the decision to diversify as a means to supply itself with a varied food supply. Running a diversified operation necessitates a wider knowledge base and varies in terms of tasks and responsibilities. “I didn’t want to be just a chicken farmer or a cattle guy,” says Patrick. “It’s interesting to do more.”

### Benefits of Diversification

Diversification provides many essential ecosystem services. The different components of biodiversity interact with one another and the physical environment to supply critical ecosystem services to the farming process, such as soil building, nitrogen fixation, nutrient cycling, water infiltration, pest or disease suppression, and pollination. In this way, diversified farming is a more sustainable form of agriculture that relies primarily on inputs generated and regenerated within the agro-ecosystem, rather than primarily on external, nonrenewable, inputs (2, 3).

*A review of 172 case studies concluded that agricultural biodiversity contributes to resilience through a number of combined strategies: the protection and restoration of ecosystems, the sustainable use of soil and water resources, and adjustments in cultivation practices (5).*



**FIGURE 3:** The farm uses waste from farm animals to make compost, an excellent soil amendment for fruits and vegetables. Diversified farming is a more sustainable form of agriculture that relies primarily on inputs generated and regenerated within the agro-ecosystem (3).



**FIGURE 2:** The farm raises around 600 broilers a year and is home to 11 goats, 16 pigs, and 11 cattle. The farm’s meat Community Supported Agriculture (CSA) supplies 90% of its revenue.

A diversified operation also provides pollination services to wild bee communities, a noteworthy benefit given the prevalence of colony collapse disorder, a malady where worker bees disappear from a colony en masse. To compensate for this sizable loss in bee population, farmers instead import hives to pollinate their crops. The bees are units in a national company and are shuttled from farm to farm, from almonds in California to apples in Washington to cranberries in Massachusetts. On the other end of the spectrum, diversified operations offer complete pollination services to wild bees by providing a diverse food source throughout the season (1).

From a financial viability perspective, having a variety of crops or enterprises can be an excellent tool for risk management. A diversified operation allows the farm to hedge its bets in detrimental years. For example, at Field to Fork Farm, while a dry year would devastate fruit trees, the farm can still manage to irrigate the vegetables and have a food source. Similarly, if a pest infestation destroyed one crop, a farmer would still be able to sell other crops not targeted by the pest. Thus, diversification functions as a safeguard against the uncertainties of farming.

### Diversification and Climate Resilience

Diversification and all of its associated management strategies contribute to an agro-ecosystem that is resilient to various aspects of climate change. A review of 172 case studies concluded that agricultural biodiversity contributes to resilience through a number of combined strategies: the protection and restoration of ecosystems, the sustainable use of soil and water resources, and adjustments in cultivation practices (5).



**FIGURE 4:** The high tunnel, an unheated greenhouse, grows tomatoes, peppers, and eggplants and allows the farm to extend its growing season.

Observations of agricultural performance after extreme climatic events, such as hurricanes and droughts, in the last two decades revealed that resiliency to climate disasters is closely linked to farms with increased levels of biodiversity (6). Across New England, extreme weather events are projected to become more frequent as a result of changing climate (7). Given these projections, it is even more imperative to be prudent about risk management. By building a more robust business model and a more resilient ecosystem, diversified operations prepare farmers for the uncertain road ahead.

*Observations of agricultural performance after extreme climatic events, such as hurricanes and droughts, in the last two decades have revealed that resiliency to climate disasters is closely linked to farms with increased levels of biodiversity (6)*

### Challenges & Opportunities

An immense challenge facing the farm is the threat of invasive species. Climate is a significant driver of pest population dynamics; there is an agricultural trend of increased pest pressure with warmer climates (7). Patrick mentions a farmer in Rhode Island who is struggling with an invasive weed, black swallow-wort. Considering the climate of New Hampshire may closely resemble the climate of its more southern neighbors in the future, the

very nature of climate change necessitates shared resources and knowledge between neighboring states and regions. Patrick is meticulously tracking the path and management of black swallow-wort in Rhode Island. “There are enough invasives here to deal with already. I’m trying to stay ahead and learn from farmers in states with slightly warmer climates,” says Patrick.

Diversified organic farming is not the prevailing agricultural practice. “There is nobody around raising organic apples and not many farmers practicing multi-species grazing in the same field,” says Patrick. “It takes time to get it right.” Indeed, for more farmers to adopt diversified farming practices, greater research and resources must shift towards better comprehending the resiliency of diversified farming systems and disseminating the benefits widely.

To learn more, visit [www.fieldtoforkfarm.com](http://www.fieldtoforkfarm.com)



**FIGURE 5:** The farm also raises honeybees for pollination and honey. Diversified operations provide complete pollination services to wild bees by providing a diverse food source throughout the season (1).

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## Climate Change and the New England Food System Case Study Series

This briefing was researched and written by the UNH Sustainability Institute's 2015 Climate Fellow, Ravdeep Jaidka. Ravdeep's fellowship focused on documenting and communicating climate impacts and adaptation strategies for New England farmers and fishermen. Ravdeep graduated from the Agriculture, Food, and Environment Master's program from Tufts University this May. She is currently the Supply Chain Coordinator at Equal Exchange, importing fair trade bananas from small producer groups in Latin America. The fellowship was based at the Sustainability Institute and hosted in collaboration with Food Solutions New England (FSNE). FSNE is a regional, collaborative network organized around a single goal: to transform the New England food system into a resilient driver of racial equity and food justice, health, sustainable farming and fishing, and thriving communities. Learn more at [www.foodsolutionsne.org](http://www.foodsolutionsne.org).