

# Extreme Weather: Challenges to local farming in a fast-warming region

Warming temperatures in the Northeast come with shifting seasons, more intense storms and more rainfall - and farmers in RI are noticing.

Kathan Teepe is the farm manager and founder of Sweet Pea Farm in Charlestown, where she grows vegetables and flowers. "I'd say I'm less concerned about the heat and more concerned with extreme weather events or unpredictable weather patterns," shares Teepe in a text message. "For example, the threat of hail at the beginning of the growing season could have been very damaging (and was for some growers)."

Moonrose Farm was hit by such a heavy hail storm at the end of June. Moonrose is a vegetable and flower farm, currently located in Cranston. Although no single weather event can be linked to climate change without an in-depth analysis, the trend of more frequent extreme weather events is driven by climate change. Jordan Goldsmith, co-founder and farm manager at Moonrose Farm, explains in an email that this extreme weather event impacted their entire growing season.

"Our farm has seen significant impact from the hail. and we are still experiencing setbacks. Our tomatoes were late this year since the first round of fruit and flowers was broken off, plus the plants were completely defoliated... The zucchini plants were almost killed by the storm ... it was very susceptible to disease and pest damage and died about 3 to 4 weeks earlier than we expected," she writes. "Our guess is all of our damaged plants were susceptible to disease and pests because their foliage was cut up, and it ultimately led to their demise... Overall it has been a pretty rough year."

The Northeast is warming and is projected to continue heating up even faster than other parts of the country. *(This and more of the latest research on climate change impacts in the United States can be found in the 2018 Fourth National Climate Assessment, a comprehensive government report completed by a group of experts.)* When looking at temperature increases over the last century, an analysis from *The Washington Post* found that Rhode Island is the fastest warming of the lower-48 states. Higher average temperatures are already changing the seasons in the Northeast - making winters more mild and encouraging spring to arrive earlier. The amount of precipitation falling in the winter as rain has already increased in the Northeast, as has the frequency of heavy precipitation events, and both of these trends are expected to continue. The Northeast also has experienced significant ocean warming and some of the highest levels of sea level rise in the country, which is caused by climate change and can increase the threat of flooding to coastal businesses, including coastal farms.

There are more than 1,000 farms operating in RI on 56,000 acres, according to the 2017 Census of Agriculture, and the state's farmers are attuned to changes in climate patterns. They work outside; they hope for predictable climate patterns and no destructive natural disasters, and they notice when heavy spring rainfall makes the ground too wet for planting or a temperature spike causes crops in the field to wilt out of season. While an earlier spring and less cold winter can lengthen the growing season with benefits for farmers, significant changes in the climate that bring heavy rains, flooding, droughts and shifting seasons mean that what's worked for experienced farmers in this region might not work anymore. In order to run a successful farm in a warming world, farmers are faced with big adjustments:

adapting their planting schedules and harvesting plans to seasonal shifts, responding to new pests and plant diseases, dealing with soil drainage challenges in a wetter world, preparing for and recovering from extreme weather events and taking care of their own bodies while doing outdoor work in hotter summers.

John Kenny manages Big Train Farm, a vegetable farm in North Scituate. He has taught an annual Soil, Plant and Farm Methodology class to other farmers and members of the public in PVD for the past eight years. Kenny comments in an email that extreme heat and other forms of extreme weather have impacted his growing seasons.

“The impact of climate change is measured not only in the hot temperatures we experience in the summer, but by extremes in weather patterns throughout the year,” Kenny writes. “For our farm, in particular, the record breaking rainfall in spring and fall we experience year after year makes things very difficult because we have natural poor drainage in our soils. Summer droughts hit many farms hard, especially those that have minimal irrigation and/or till their soils often... Crops are harder to get established in hot weather and are more susceptible to pests and disease, especially under tillage systems. Extremes are the name of the game with weather now.”

Rising temperatures can make farming more difficult and dangerous. Working outside in a heat wave can put farmers at risk for heat stroke. People with outdoor occupations, like farmers, will also be at higher risk for mosquito- and tick-borne diseases, which are on the rise in part due to changing climatic conditions. Kenny comments, “Hot weather is difficult to work in, especially when in the high 90s or triple digits.”

Farmers can also be part of building a lower carbon future. The University of Vermont Center for Sustainable Agriculture conducts research to support farmers as they adapt to climate change in the Northeast and explores ways that farmers can help combat dangerous climate change by using regenerative farming practices that store carbon in the soil and release fewer emissions.

Kenny of Big Train Farm writes, “Interestingly, the tools and systems employed by farmers to mitigate the damage of climate change are the same methods that help combat climate change (soil conservation, carbon sequestration, etc).”

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