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### Spring Rain Farm: Planning and Preparedness

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## Spring Rain Farm: Planning and Preparedness

Located in Taunton, Massachusetts, Spring Rain Farm is a 112-acre family farm producing cranberries, strawberries, hay, and pastured meat. Purchased by Bill and Mary McCaffrey in 1980, the family business now has the helping hand of their son, William.

### The Cranberry Industry in Massachusetts

Cranberry, one of three commercially grown crops native to North America, was first cultivated commercially in Dennis, Massachusetts in 1816 (1). Today, centuries later, the cranberry industry is a stronghold in the state's economy. Nestled among the towns and villages of Southeastern Massachusetts and Cape Cod lie over 13,000 acres of productive cranberry bogs. In fact, cranberries are the state's highest-ranking crop in terms of production value. Massachusetts is the country's second largest cranberry producer after Wisconsin (2). In this way, cranberries are deeply rooted in both the history and the economy of Massachusetts.

### Cranberry Production

Cranberries are a perennial vine grown in beds layered with sand, peat, and gravel. These beds, known as 'bogs', are constructed specifically for cranberry production and mimic the wetland habitat of indigenous cranberries. Of the 112 acres spanning Spring Rain Farm, 12 acres are devoted to cranberry production. The farm has a total of 4 bogs, producing three different varieties of cranberries.



**FIGURE 1:** Spring Rain Farm is a 112-acre family farm producing cranberries, strawberries, hay, and pastured meat. Twelve acres are devoted to cranberry cultivation (7).

Cranberries have a 16-month growth cycle (1). In early winter, around December, the cranberry bogs are flooded to protect the vines from severe winter weather. In spring, the bogs are drained. The summer months are occupied with weeding, irrigation, and pest management. Finally, in early fall, the cranberries are harvested. Cranberries can be harvested in two ways: dry or wet. Dry harvesting uses machines to comb the berries off the vines. In wet harvesting, the bogs are flooded. Since cranberries have pockets of air inside them, the berries float. More than ninety percent of cranberries are wet harvested, including the berries at Spring Rain Farm (3).

## Management Practices

Cultivating cranberries in a bog, a highly controlled and unique environment, necessitates meticulous planning and methodical management. Since cranberries are native to northeastern United States, the pest pressure is severe compared to other crops. Whereas crops that are native to other parts of the world are removed from the pests that plague them in their native ecosystem, all the insects and diseases that evolved to specialize in attacking cranberries are right here.

Due to intense pest pressures, cranberry growers are compelled to develop effective strategies for pest management. Spring Rain Farm practices Integrated Pest Management (IPM), a holistic approach that utilizes information on the life cycle of pests and pest interactions with environment in combination with biological, cultural, mechanical, and chemical controls. IPM is an effective and environmentally sensitive approach that minimizes hazard to people and environment (4).



**FIGURE 3:** Since cranberries are native to northeastern United States, the pest pressure is severe. Spring Rain Farm practices Integrated Pest Management (IPM), a holistic, effective, and environmentally sensitive approach to pest management that minimizes hazard to people and environment.



**FIGURE 2:** Ninety percent of cranberries are wet harvested, which means the bog is flooded. Since cranberries have pockets of air in them, the berries float on top (7).

Water is the single most important resource in cranberry production. Since cranberries are wet harvested and flooded during the winter months, an adequate water supply is imperative. Through a United States of Agriculture (USDA) grant, the farm built a water hole, hedging its bets in drier years. With another grant, the farm constructed a lift pump, reducing their energy costs tremendously. Through prudent planning and infrastructure development, Spring Rain Farm built a comprehensive water management system that ensures an adequate water supply.

## Climate Impacts

Extreme weather conditions threaten the unique management systems in a cranberry bog. Across New England, extreme weather events are projected to become more frequent as a result of changing climate (6). “I have no problem with adversity as long as it’s consistent. I can plan for that,” says William. “But if it’s inconsistent, like we get hail this year, next year it’s a drought, and the year after that there’s too much water, then we have to design a system that can endure all of those things very occasionally.” Unpredictable weather patterns disrupt the carefully managed systems, making cranberry production vulnerable.

*Cranberries require 1,200 to 1,400 chilling hours to complete their dormant cycle. By mid-century, under the high emissions scenario, Massachusetts may be unable to provide the long winter-chill period required for cranberry production, putting the future of cranberries in peril (6).*





**FIGURE 4:** Water is the single most important resource in cranberry production. Through a USDA grant, the farm constructed a lift pump, reducing their cost to flood the bog from \$400 to \$50.

Rising temperatures pose an additional risk. Perennial plants require a certain number of chilling unit requirements to break dormancy, with cranberries requiring 1,200 to 1,400 chilling hours. By mid-century, under the high emissions scenario, Massachusetts may be unable to provide the long winter-chill period required for cranberry production, putting the future of cranberries in peril (6).

In terms of climate impacts, William is also concerned about colony collapse disorder, a malady where worker bees in a colony disappear en masse. A host of interacting and compounding factors contribute to the ailment. While there is growing evidence that a class of pesticides, known as neonicotinoids, play a role, climate change is a driver as well (5).

Climate change can disrupt the timing between bees and bloom, so that when pollinators come out of hibernation, the flowers are not in bloom, creating a mismatch between bees and their food (5). Extreme weather poses a threat to bees as well. “Bees don’t do well in extreme conditions; they don’t like to pollinate when it’s cold or too hot. It’s a lot more stress for the bees,” states William. Bees are important pollinators of agricultural crops, including cranberries. Thus, colony collapse disorder has significant implications for agricultural production.

## Challenges

According to William, the biggest challenge in growing cranberries is price volatility in agricultural markets. While price fluctuations are a common feature of a well-functioning agricultural market, large, unexpected swings can devastate growers. In the late 1990s, amidst a highly saturated market, prices dropped precipitously. The industry is still recovering and prices remain depressed. In these somber times, independent growers, like Spring Rain Farm, remain patient and wait for prices to rise again.

## Identified Needs & Opportunities

Because of his background in sustainable agriculture and holistic management, William is intrigued by the concept of growing cranberries in a more sustainable environment. Due to the dense, continuous, and patched nature of bogs, pest pressures are magnified. “I’d love to figure out a way to grow and plant cranberries that were not so monoculture and see if there were some way to reduce pest pressures from that,” notes William. Indeed, as climate impacts and pest pressures become more pronounced, there will be a greater need to innovate, adopt, and integrate sustainable management practices into the traditional cultivation methods of cranberries.

To learn more, visit the Facebook page of Spring Rain Farm, Taunton, MA.



**FIGURE 5:** By mid-century, under the higher emissions scenario, Massachusetts may be unable to provide the long winter-chill period required for cranberry production, putting the future of cranberries in peril.

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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).