

Adapting to change: A look at Maine agriculture



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Who We Are

The Maine Climate and Agriculture Network was initiated by faculty at the University of Maine to increase communication and coordination among those working on issues related to climate and agriculture. This web site provides an initial portal to some of the climate related activities at the University of Maine, and serves as an invitation to those with an interest in this topic to participate. The Maine Climate and Agriculture Network is intended to be a transparent and inclusive framework that will represent agricultural concerns and activities in the broader conversations on climate change across campus and with other institutions and agencies within the state and region (e.g., the USDA Northeast Climate

Climate and Ag in the News

Press Herald quotes Fernandez in article on effort to cut greenhouse gas emissions

VillageSoup previews Camden presentation on Maine's changing climate

UMaine research, resources cited in BDN editorial on vulnerability of Maine's coast

Jemison, Koehler quoted in BDN report on climate change realities for gardeners

www.umaine.edu/climate-ag/

“Farming in a New Weather Reality”

Farmer Panel Session

Maine Agricultural Trades Show

January 9, 2018

Farming operations represented:

- Sheep & fiber
- Honey bees
- Turf
- Apples
- Mixed vegetables

Perceived Weather Δ	Perceived Impacts
↑ heavy precipitation (4)	↑ soil erosion ↓ field access Poor crop establishment
↑ growing season length, & milder winters (3)	New pests & and parasites ↑ Lyme disease ↓ tree death due to freezing

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<p>cooler, wetter springs (2)</p>	<p>Slow N mineralization Lamb death & wet wool Delayed manure spreading</p>
<p>↑ drought (2)</p>	<p>↑ customer demand for drought-tolerant grasses ↓ pasture regrowth</p>

Turf

Rainfall Extremes

- Drought
- Erosion and field access



Downeast Turf

Adaptation Response

- Species and variety selection
 - drought tolerance; quick growth for erosion control
- Infrastructure investment
 - irrigation; 4WD harvester

Mixed Veggies

Heavy Rains

→ Erosion and field access



Adaptation Response

- Permanent raised bed system
new equipment to implement
- Adjusted bed orientation



**What impacts will
climate change have
on Maine's ag
economy?**

Farm Response to Changing Weather

Changes in average and extreme weather are affecting Maine agriculture, bringing both risks and potential opportunities. Here are some observations of how Maine weather is now different from the past, what may lie ahead, and examples of farmer choices and actions that can minimize risk and help ensure productivity.

Temperature

Longer Growing Season and Plant Hardiness Zone Shift

- The average length of Maine's frost-free growing season is now 12–14 days longer than in 1930, and is expected to further increase by 2–3 days per decade.
- Winter minimum temperatures that define plant hardiness zones are increasing faster than daily highs or temperatures in other seasons.

Potential Response Actions

- Choose longer season crops or varieties, or be flexible with earlier or later planting dates for current selections.
- Double cropping, inter-cropping, and greater use of cover crops.

Early Spring Warm-up Increases Frost/Freeze Risk

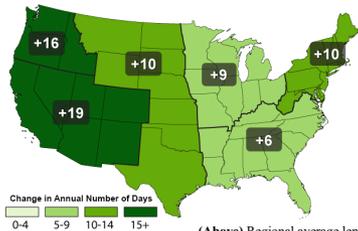
- Late winter/early spring temperature variability has caused early crop development before the last spring freeze date. Spring frosts affected Maine apple, blueberry, and peach crops in 2012 and 2016.

Potential Response Actions

- Consider spring frost risk in site/crop/variety, and planting date decisions.
- Minimize frost risk (hoop houses, mulch, row covers, inter-cropping, no-till).
- Enhance emergency response capacity (freeze forecasts, wind machines, irrigation, heaters, frost protectants).
- Diversify farm enterprise. Consider crop insurance to spread risk.



(Above) Recent, current, and future projected plant hardiness zones. Zone numbers labeled in top map. Data Source: PRISM Climate Group, Oregon State University, <http://prism.oregonstate.edu>.



(Above) Regional average length of frost-free season for 1991-2012 compared to 1900-1960. Adapted from Melillo et al. (2014), *Climate Change Impacts in the United States*.

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Climate change will bring opportunities and risks



Research & Tools:

- modeling to assess climate adaptation strategies in potato-grain rotations;
- research looking at potential weed invasions in Maine's changing climate;
- *Ag Radar* – a low cost system to integrate weather into orchard management decisions.



Thank you!

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Special thanks to Ellen Mallory, Sonja Birthisel, Glen Koehler and ME-CAN for their contributions to this presentation and funding from the USDA Risk Management Agency.

