Common Sense Planning for **Climate Change Impacts** in **New England Orchards**

Glen Koehler
New England Vegetable & Fruit Conference
December 17, 2024

1865 THE UNIVERSITY OF MAINE Cooperative Extension

Outline

- ✔ **Project overview**
- ✔ **Curriculum Guide**
- ✔ **Climate Trends Background**
- ✔ **Self-study Checklist of Issues, Options, Review questions, Resources**

Rachel Schattman, UMaine

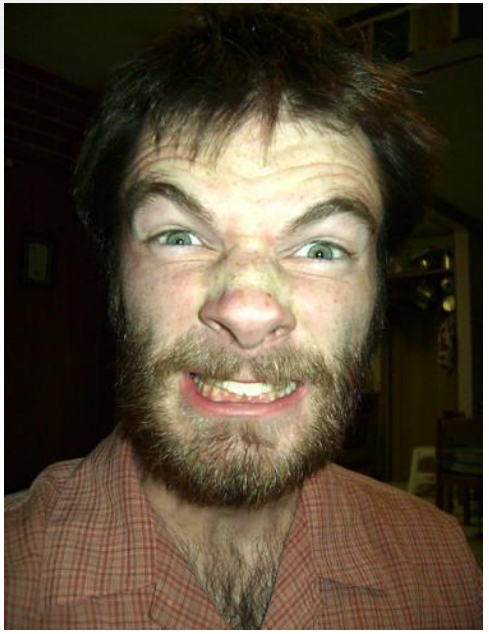
Joshua Faulkner UVM

A peer-to-peer learning program that builds climate resilience.

Climate change is reshaping the landscape of agriculture bringing challenges like extreme rainfall and flooding, increased pest pressure, and drought.

The Climate Adaptation and Mitigation Fellowship is designed to empower farmers and agricultural advisors to share knowledge and tools for resilience in climate uncertainty.

"If you are having trouble talking to a farmer you probably need to check your ego at the door. They spend every day taking in their reality and dealing with survival on the most basic level."



"No matter how many degrees you have, they know more than you."

After peace was made with the project, we had to agree *within* the tree fruit team on what we were talking about.

Image by Hasse Froom from Pixabay

That resulted in changing the topic to

“Changing Weather Challenges”

~~not “Climate Change”*~~

* No humans or friendships were harmed in the making of this curriculum.

Tree Fruit Team consensus

1) Warmer average temperatures,
Earlier spring warm up and bud break,
More intense rain events,
Longer summer dry spells,
and warmer Autumns …

Have occurred too regularly to be dismissed as random weather fluctuations.

2) *On-farm observations corroborate scientific

trends in temperature and rainfall

*Weather at their locations has become **more erratic**

*Formerly unusual episodes of **heat**, **cold**, **rain**, and **drought** have become **more frequent or extreme**.

3) Each farm is unique.

There are no *"one size fits all"* solutions for weather challenges

4) **Better to include ideas that may be workable for only a few growers.**

Even an unrealistic option may inspire a new creative solution that does work.

5) Continued farming is the goal

Selling house lots is not in the "solution set"

6) Growers are already good at taking advantage of new opportunities.

The tool should focus on identifying and dealing with problems likely in the next 30 years.

7) The Northeast tree fruit industry needs to **consider adaptation measures to reduce sensitivity** and **increase resilience** to plausible future weather conditions, regardless of the cause.

Climate Adaptation Fellowship
Tree Fruit Module
CURRICULUM GUIDE

Curriculum Guide for "Changing Weather Challenges and Adaptation Strategies for Northeastern U.S. Tree Fruit Growers"

Barney Hodges, Glen Koehler, Andy Ricker, Andre Tougas, and Steve Wood
for "The Climate Adaptation Fellowship: A Collaborative Curriculum Design Project"
August 2019

Contents

Co-leadership
by a Grower opinion leader +
an Extension partner for support

Primary activity is

Grower-to-Grower

issue-focused conversations

e.g.

What has worked for X….?

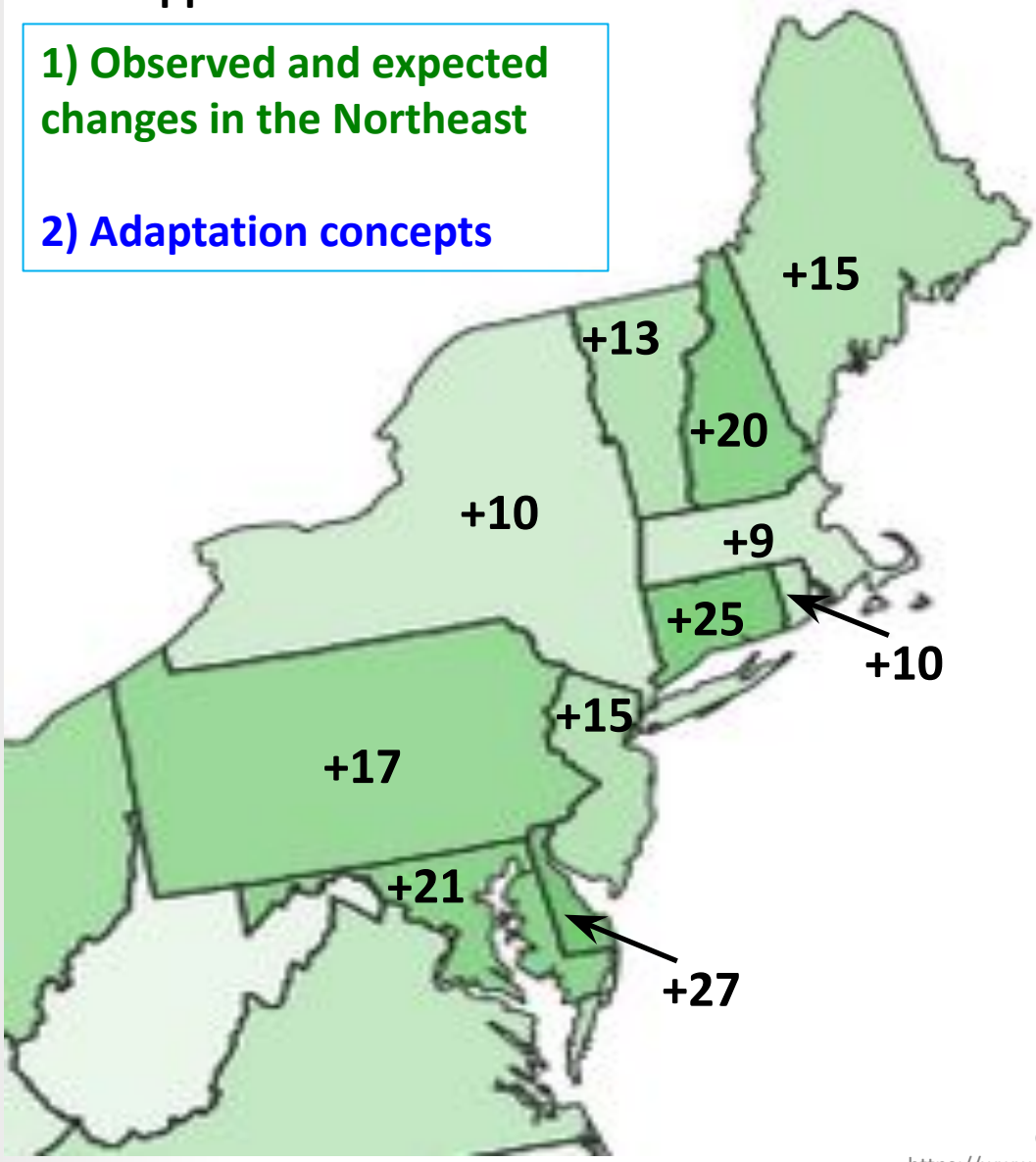
How could you Y …?

Two supplemental slide sets

1) Observed and expected changes in the Northeast

2) Adaptation concepts

Change in Length of Growing Season 1895-2016



Number of days increase in growing season length

20 - 30

10 - 20

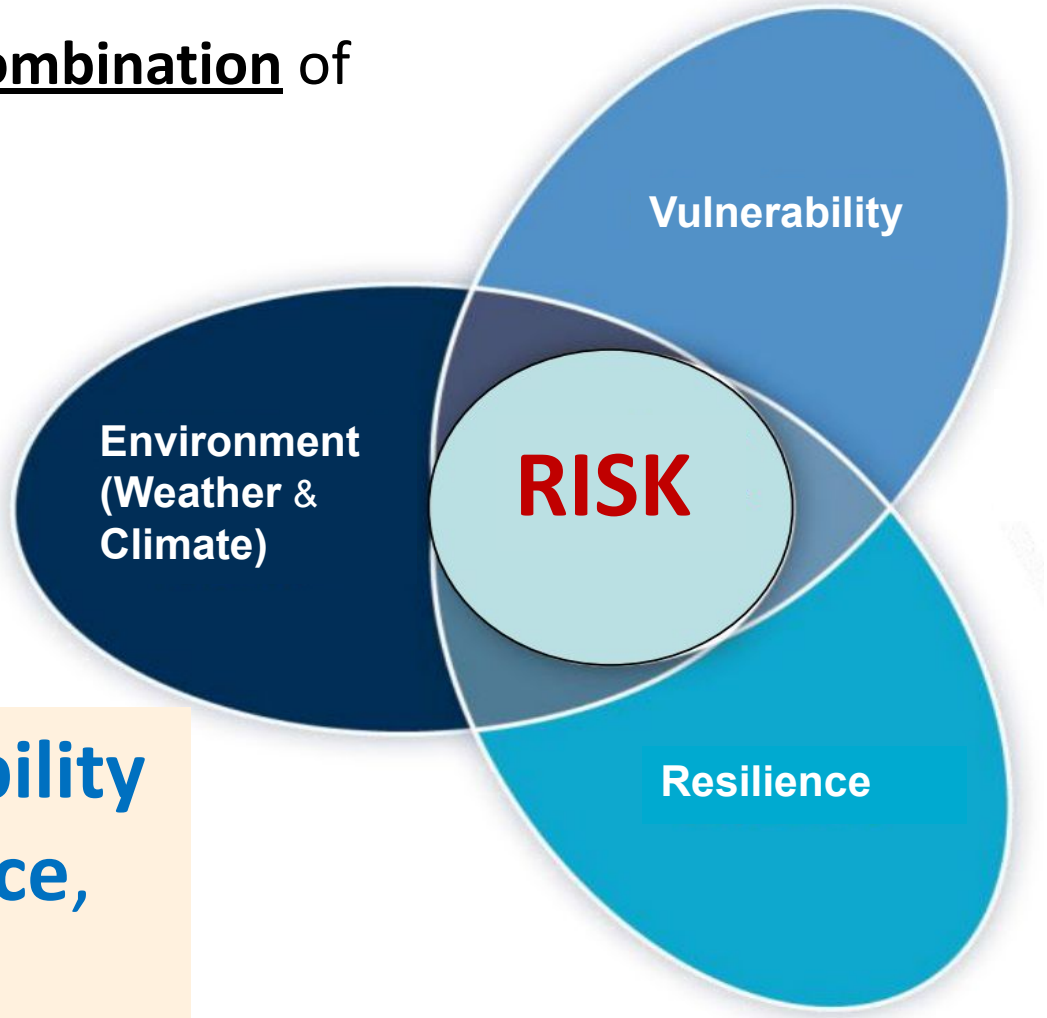
2 - 10

Most of the change has been since 1970

Graphic adapted from: USEPA, Climate Change Indicators in the United States
https://www.epa.gov/climate-indicators/climate-change-indicators-length-growing-season

Risk level is <u>not dictated</u> by the environment

Risk to your farm is a **<u>combination</u>** of
Environment,
Vulnerability, &
Resilience.



By reducing **Vulnerability** and building **Resilience**, **you can reduce Risk.**

From IPCC, 2012: Summary for Policymakers. In: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, UK, and New York, NY, USA, pp. 1-19.

Session plans, Activities, Homework, Logistics, etc.

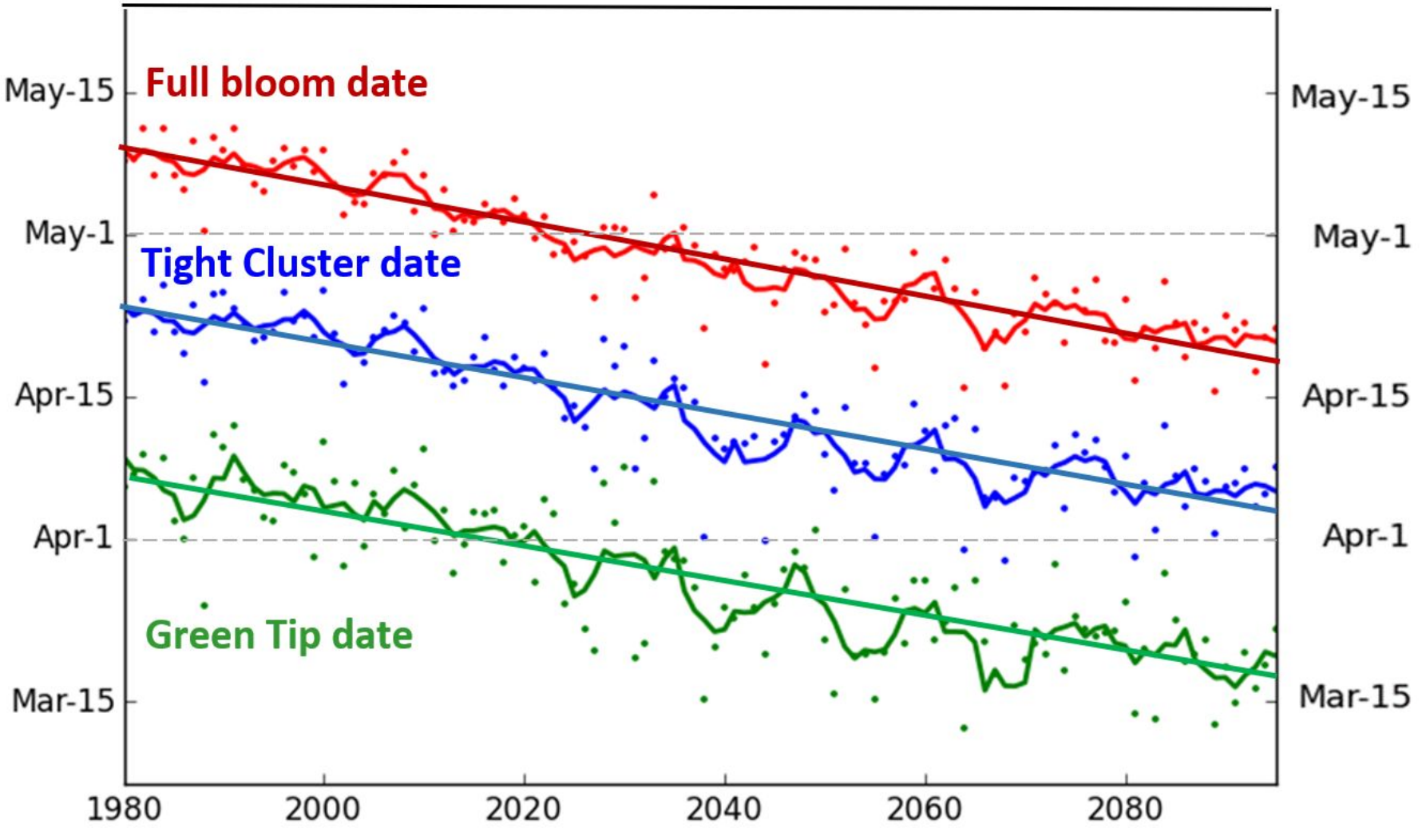
Session 1		
Objectives 1. Collect pre-class self-assessments of familiarity with workshop topics. 2. Build comfort and familiarity for communication with fellow workshop participants. 3. Provide background scientific information about climate change in the Northeast. 4. Introduce the "Self-study Checklist - Changing Weather Challenges & Adaptation Strategies" and "Recent and Near-future Climate Trends Important to Tree Fruit Production in the Northeastern U.S." as the document components of this curriculum. 5. Create commitment for self-directed use of the checklist between Session 1 and Session 2.		
Introductions	20 minutes	Introduction of the workshop leaders and objectives of the workshop series. Review objectives and agenda of this session.
Pre-class survey	10 minutes	Collect surveys or have participants fill out short survey.
Ice breaker - Partner interviews and reports	60 minutes	10 minutes for each partner to interview the other = 20 minute partner interviews + 40 minutes for reports (5 minutes per pair x 8 pairs) = total 60 minutes.
Break	20 minutes	Food and beverages.
Slide Presentation	60 minutes	"Farmer Response to Changing Weather, Part 1" 45 minutes for slides, 15 for discussion during and after.
Review course documents	30 minutes	"Self-study Checklist - Changing Weather Challenges & Adaptation Strategies" "Recent and Near-future Climate Trends Important to Tree Fruit Production in the Northeastern U.S."
Homework assignment	15 minutes	1. Work through the Self-study checklist 2. Share their findings with their assigned Checklist partner Partners will present a 10-minute summary of each other's findings at the next session. 3. Enlist two volunteers for a longer in depth presentation of their Checklist results.
Closing questions and discussion	15 minutes	Total class duration: 230 minutes = 3 hours 50 minutes.
Between Session 1 and Session 2	* Participants complete the Self-study Checklist. * Six participants communicate with their checklist partners to write a summary of their partner's major issues and responses to present at the next session. * Two participants prepare a 20-minute presentation on their Self-study Checklist results.	

Recent and Near-future Climate Trends Important to Tree Fruit Production in the Northeastern U.S.

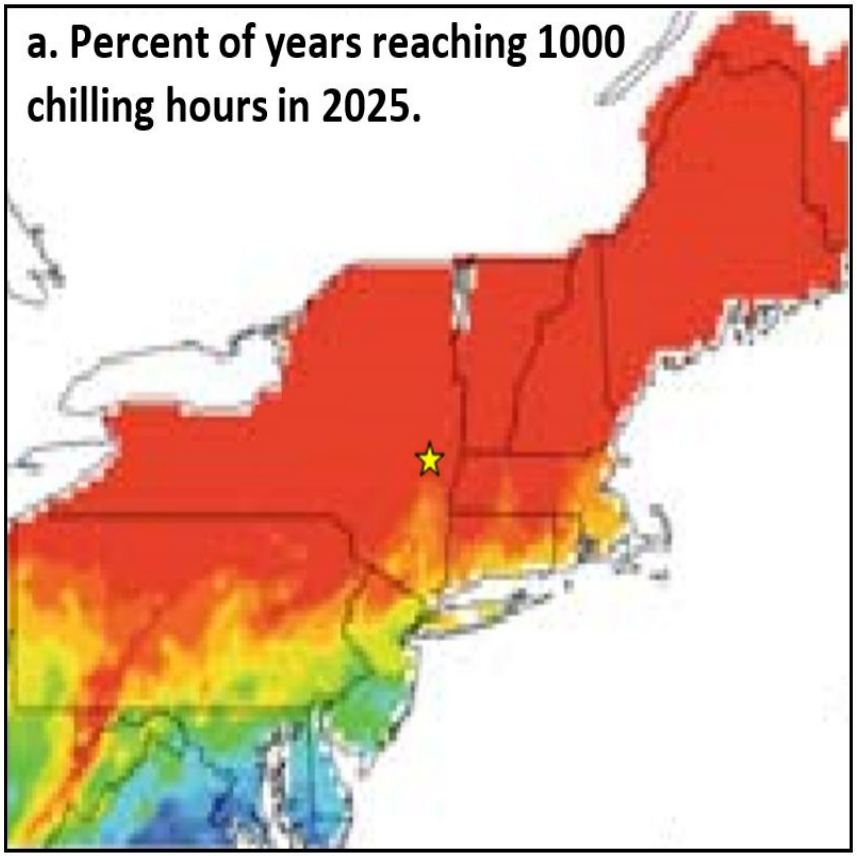
Compiled by Glen Koehler
University of Maine Cooperative Extension
August 2019

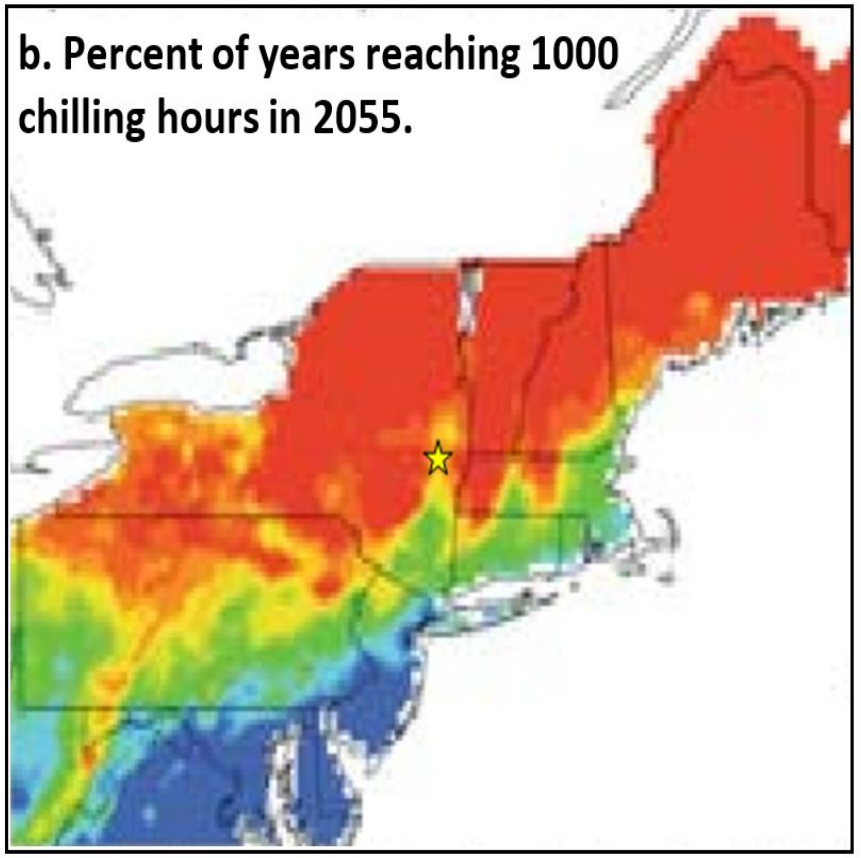
Contents

Observed and projected calendar dates for apple bud stages.



Projected chilling hours in 2025 and 2055.





Percent of years reaching 1000 chilling hours

0 10 20 30 40 50 60 70 80 90 100

Self-study Checklist
Changing Weather Challenges and Adaptation Strategies for Northeastern U.S. Tree Fruit Growers

Barney Hodges, Glen Koehler, Andy Ricker, Andre Tougas, and Steve Wood
for "The Climate Adaptation Fellowship: A Collaborative Curriculum Design Project"
Version 1.1 September 5, 2019

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….. + other stuff

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1. High volume rain events.

The amount of rain in the most intense events has increase 55% in the Northeast In recent decades. The number of rain events per year in Maine with over 2 inches within 24 hours doubled from 2000-2009 to 2010-2017. The frequency of 2-inch rain events in the Northeastern U.S. tree fruit growing areas is expected to increase 25% to 100% between 1994 and 2055. A 100% increase means a doubling of the number of events.

Impact on Tree Fruit Production:

1a) Saturated soil in April - June limits tractor access, or results in deep ruts.

Potential Adaptations:

For new plantings:

___ Add drainage tile. Contact your local NRCS/FSA office for assistance.
___ Water diversion paths.
___ Ditches w/ flash flood riprap.

For existing plantings:

Even if the ground is saturated, sometimes you have to go in anyway.

___ Use light tank loads.
___ Wider or flotation tires may be an option for some tractors to reduce tire track damage.
___ Dual tire tractors.
___ Add drainage where possible.
___ Consolidate prunings in every other row to reduce tractor traffic for brush chopping.

Rut repair: (For when you have to get into the orchard despite damage to saturated soil).

___ Late summer rototilling of rutted areas, seed in with desirable alley vegetation, then stay off until next year. Thus you can only do alternate rows within the first year to retain access for harvest operations, and for the first spray trips of the next season.

___ An alternative option is filling in ruts with coarse sand or crushed rock/gravel.

Other tactics to reduce number of spray trips and rutting:

___ Monitor pest levels through foliar inspection, traps, and weather-based pest and horticultural tracking/prediction models to identify when pesticide application is needed, and when it can be avoided or delayed.

___ Alternate row sprays.

___ Use of apple scab fungicides with post-infection activity for more flexibility in spray timing.

___ Use trap-tree and perimeter-only insecticide sprays for plum curc

….. etc., + another page of options to reduce the number tractor trips over soggy soil

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Review Questions:

What areas of my orchard and business operations are most vulnerable to high intensity rains?

What are my highest priorities for cost-effective, “no-regrets”, adaptations?

Lower priority steps to reduce vulnerability:

Contact persons, existing assets, responsibility assignments, action steps, and timelines to reduce risk from high volume rain events:

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Resources:

U.S. Climate Resilience Toolkit Climate Explorer (U.S. Federal Government, 2018)

Maps, graphs, and data for estimated future frequency of +1, +2, and +3 inch rains within one day at county-level resolution.

https://noaa.maps.arcgis.com/apps/MapJournal/index.html?appid=8b910d9c7b9744ea94e07d82f5420782

All the documents are online

www.adaptationfellows.net/

The end…

…or a new start?

Next up right here!

* **Fire Blight Management:**
  Climate Change Considerations

* **Shifting Priorities and Challenges in**
  Pome Fruit Pest Management

* **Don’t Let Weather Surprise You:**

NEWA, sensors, forecasting models, and more

Tue. Dec. 17, **3pm – Contoocook**

*Pivots and Planning: my farm's framework for assessing climate risk

Wed. Dec. 18, 9:30am – Contoocook

*Current and Projected Climate Impacts on Agriculture in the Northeast

10am – Contoocook

*A Whole Farm Approach to Climate Smart Practices

10:30am – Contoocook

*How I worked with NRCS to Make My Farm More Resilient to Extreme Weather

*Orchard Protection in Modern Agriculture (Panel)

Wed. Dec. 18, **11:30am – Merrimack**

*Orchard Protection in Modern Agriculture (Speaker)

Thur. Dec. 19, **9:30am – Frost/Hawthorne**