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Managing Flood Risks on Farms

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Introduction

This article provides flood-related information to Connecticut growers, particularly relevant to vegetable and fruit growers in flood-prone regions.



It offers strategies to prepare for, respond to, and recover from flooding events, covering what actions to take, when to implement them, how to execute them, and why they are essential.

Increasing Flood Risks in Connecticut Agriculture

Connecticut has experienced a notable rise in extreme weather events, especially flooding, in recent years. In July 2023, for example, floods led to over \$21 million in sales losses across more than 1,500 acres of farmland. Surveys by the Connecticut Department of Agriculture in 2023 and 2024 estimated weather-related losses exceeding \$50 million.

Flooding can happen in two ways: river flooding, which is often the result of intense rainfall over a short period; and pooling or ponding of water directly on fields due to heavy localized rainfall combined with inadequate drainage. These distinct types of flooding require different mitigation and response strategies.

Inadequate drainage may result from inherent soil properties, such as the soil's natural drainage capability, shallow depth to the water table, underlying bedrock, or minimal slope. However, human-induced factors, such as soil compaction from repeated traffic, reduced infiltration from poor residue management, and the loss of organic matter due to over-cultivation can all impair water movement, and increase vulnerability to field saturation.

Current Flood Risk Outlook for Connecticut

The Northeast U.S. coast has seen a doubling of annual flooding days since 2005, partly due to the weakening of the Atlantic Meridional Overturning Circulation (AMOC), which affects sea level rise and flooding frequency. The region experienced its wettest year on record from July 2023 to June 2024.

Areas near rivers and streams, regardless of past flood history, are increasingly vulnerable. What were once considered 100-year storms are occurring more frequently, and farmland that has never experienced flooding before has been impacted from recent events. Essentially, all land adjacent to waterways should now be considered at risk, highlighting the importance of reassessing floodplain boundaries and adapting land use practices accordingly.

Adding to this risk is the large number of aging, privately owned dams across Connecticut, many of which are poorly maintained, and not built for today's extreme weather. A breach can cause sudden, severe downstream flooding, threatening farmland, infrastructure, and safety. Farmers should know if dams are upstream of their property and understand the potential impacts. Staying informed and engaged in local dam safety is key to farm resilience.

Key Strategies for Flood Preparedness

1. Monitor weather and flood risks

- Utilize tools like agroclimate.org for regional climate risk assessments, NEWA (Network for Environment and Weather Applications) for field-level forecasts and crop models, and the National Weather Service for alerts and flood warnings.
- Early awareness enables timely actions to protect crops, equipment, and infrastructure.

2. Assess farm vulnerabilities

- Use historical data, elevation maps, and local knowledge to identify areas most susceptible to flooding. Walk fields after heavy rains to observe pooling or erosion.
- Leverage publicly available tools to support site assessment:
 - FEMA Flood Map Service Center – Search by address to view flood zones and insurance risk areas: <https://msc.fema.gov/portal/home>
 - USGS Topographic Map Viewer – View detailed elevation, hydrology, and landform data: <https://www.usgs.gov/tools/topoview>
 - NRCS Web Soil Survey – Identify soil types, hydrologic groups, and flooding frequency: <https://websoilsurvey.sc.egov.usda.gov>

- CT Environmental Conditions Online (CT ECO) – For Connecticut-specific elevation, aerial imagery, and LIDAR flood risk layers: <https://cteco.uconn.edu>
- Understanding vulnerable areas helps prioritize interventions and protections.

3. Protect equipment and inputs

- When flood risk is forecasted within 24 - 72 hours, relocate machinery, fertilizers, fuels, and pesticides to higher ground or protected structures.
- Preventing contamination and equipment damage avoids costly losses and environmental risks.

4. Safeguard crops and soil

- As flood warnings arise or seasonally, harvest market-ready crops ahead of storms, maintain grassy buffers (30+ feet) near water bodies, and use cover crops to prevent erosion in vulnerable fields.
- These practices minimize yield loss, soil degradation, and post-flood contamination.

5. Prepare an emergency response plan

- Create a written flood response and recovery plan. Include staff roles, communication protocols, evacuation routes, and equipment checklists. Store copies both digitally and in print.
- Be aware of your town or city's Emergency Management Director and how to contact them.
- Ensure your insurance coverage includes flood-related damage to not only crops, but to equipment and buildings.

6. Water safety and soil health after flooding

- Once floodwaters recede (at your earliest convenience), test well and irrigation water for pathogens (e.g., *E. coli*) and soil for nutrient levels and potential contaminants before replanting.
- Floodwaters can introduce biological and chemical hazards, making timely testing essential for food safety and crop success.

7. Post-flood recovery and compliance

- Take photos as soon as possible following the event. As soon as damage is assessed, discard produce contacted by floodwaters (as considered adulterated by the FDA), and keep records for insurance or disaster relief.
- Ensures compliance with food safety regulations and supports financial recovery. The flood food safety fact sheet for fruit and vegetable farmers provides more information.

8. Pest and disease management after flooding

- Even if plants survive inundation, they may be physiologically stressed and more vulnerable to pests and diseases. Prolonged leaf wetness and high humidity promote foliar fungal and bacterial infections, while saturated soils can increase the prevalence of soil-borne pathogens such as *Pythium*, *Phytophthora*, and *Rhizoctonia*.
- Wet conditions also complicate timely pest management. Frequent rainfall may limit access to fields and reduce pesticide efficacy, as one inch of rain is typically sufficient to wash off many foliar-applied products.
- Monitor closely for disease and insect outbreaks post-flood, adjust IPM strategies as needed, and consult extension or crop advisors for treatment plans.

9. Invest in long-term flood mitigation practices

- Be aware of designated flood zones when constructing new buildings, installing fuel tanks, placing wells, or deciding on sites for other permanent infrastructure.
- Implement field drainage improvements (e.g., surface ditches, subsurface tile drains) in areas that frequently experience pooling or prolonged soil saturation to improve trafficability and root health.
- Use deep-rooted cover crops like daikon radish, ryegrass, or sorghum-Sudangrass in rotation to reduce compaction and break up hardpans, improving infiltration and root penetration.
- In flood-prone areas near rivers or streams, establish woody riparian buffers (trees, shrubs, and perennial grasses) to stabilize banks, filter runoff, and slow floodwaters.
- Install perpendicular vegetative field buffers or contour grass strips across slopes to intercept and slow overland water flow, reduce erosion, and trap sediment.
- These practices build long-term resilience, reduce off-site impacts, and may qualify for USDA NRCS conservation funding or technical support.

Resources

- UConn Extension Flooding Resources: <https://s.uconn.edu/flooding>
- Connecticut Department of Agriculture's Disaster Relief Resources page: <https://portal.ct.gov/doag/adarc/adarc/disaster-relief-resources>.
- AgroClimate Tools: <http://agroclimate.org/>
- NEWA Crop and Pest Management: <https://newa.cornell.edu/crop-and-pest-management>(Extension Publications)
- Subscribe to UConn Extension and other agricultural service provider listservs for localized updates.

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