FLOODING AND FARM FOOD SAFETY IN HAWAI'I

Flooding is the overflowing of a field with water outside of the grower's control, and it creates food safety risks due to pathogens, sewage, chemical contaminants, heavy metals, petroleum products, and debris originating from outside the farm. This fact sheet lists steps to ensure the short- and long-term safety of food and workers after flood events.

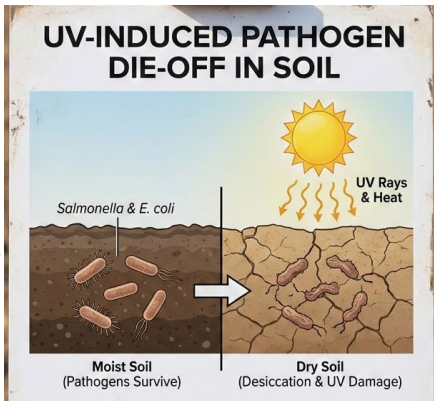
WHAT TO DO WITH CROPS IMPACTED BY FLOODS?

- If floodwater contacts the edible portion of a crop (i.e., submersion, splash), the crop is considered ADULTERATED under Section 402(a)(4) of the Federal Food, Drug, and Cosmetic Act and should not be sold for human food consumption. Examples include leafy greens, herbs, root crops, and ground-level fruiting crops like squash. Even if crops appear undamaged, contaminated water can infiltrate the edible portions through wounds or natural openings.
- Crops near flooded fields or where the edible portion is above the floodwaters should be evaluated on a case-by-case basis if the edible portion did not contact floodwater. Contamination risk is lower when the edible portion develops after the flood receded, when the lowest edible portion remained above floodwater with minimal splash risk, and when the crop can be harvested without cross-contamination from nearby flooded soil or plant tissue.
- Avoid cross-contamination by separating flood-affected and non-flooded crops; maintaining a buffer zone (ex. ~30 ft) between flooded and harvestable areas; cleaning and sanitizing equipment or designating separate ones between areas; wearing protective clothing and equipment; and checking water sources before resuming harvest or planting.
- Dispose of adulterated produce in a food-safe manner, such as tilling leafy greens into the soil after the field drains, or leaving unsalable fruit in place to decompose for orchard crops.
- Adulterated crops CANNOT be processed because kill steps, such as canning, pasteurization, or irradiation, may reduce some microbial hazards but do not address chemical contaminants that may be present in floodwater. There is no practical way to recondition crops to ensure their safety after they are contaminated by floodwater.

WHAT ARE THE STEPS TO REMEDIATE MY FARM AND FIELDS?

- Evaluate and, if needed, test well water and surface water sources, especially if wellheads were submerged. Agricultural water must be safe for its intended use as stated in the FDA FSMA Produce Safety Rule (e.g., irrigation, crop sprays, postharvest rinses, etc.).
- Allow fields to dry sufficiently before reworking or replanting.

For more information, please contact your local University of Hawaii Extension Agent



- For microbial pathogens, wait about 30 to 60 days before replanting to allow microbial die-off. Pathogens in soil generally decline over time as soils dry, and the soil microbiome recovers.
- Evaluate what contamination sources may have contributed upstream, including cesspool and septic releases, livestock areas, urban and industrial runoff, and fuel or chemical storage areas. Understanding nearby land use can help farmers determine their potential testing needs.
- Consider testing soil for heavy metals or other contaminants when flooding involves industrial, sewage, petroleum, or chemical sources. (*Note: There is natural variation in the background levels of some elements in Hawai'i soils. Post-flood test results should be interpreted carefully and compared with baseline levels. For Hawaii-specific environmental actionable levels, please visit:* https://health.hawaii.gov/heer/guidance/specific-topics/background-metals/)
- Pesticide residues are less likely to pose long-term problems in most fields because many pesticides degrade in soil, but the risk may be higher when floodwater moves through storage facilities containing large amounts of concentrated pesticides.
- Agronomic soil testing after flooding can help identify nutrient losses from erosion, leaching, and denitrification in saturated soils.
- Organic producers should contact their certifier to determine next steps. Flooded fields will not automatically lose their organic certification or require a 3-year transition period, but this needs to be determined on a case-by-case basis. Due to the potential presence of prohibited substances in floodwaters, certifiers may require testing to make certain determinations.

HAWAI'I RESOURCES

UH CTAHR Farm Food Safety: Farm food safety education and support http://manoa.hawaii.edu/ctahr/farmfoodsafety/ ; https://cms.ctahr.hawaii.edu/er

UH CTAHR Cooperative Extension: Extension agents, GoFarm Hawai'i, UH Organic Transition Program, UH Sustainable and Organic Agriculture Program, Seeds of Wellbeing

Hawai'i Department of Agriculture & Biosecurity: Produce safety information and disaster-related agriculture updates. https://dab.hawaii.gov/ ; https://www.hifarmsafe.org/

USDA Farm Service Agency: Disaster assistance. https://www.fsa.usda.gov/state-offices/hawaii-and-pacific-islands

NRCS Pacific Islands Area: Support for conservation planning and recovery practices. https://www.nrcs.usda.gov/contact/state-office-contacts/pacific-islands-area-state-office

Other local farmer support: Hawaii Farm Bureau Federation, Hawaii Farmers Union United, North Shore Economic Vitality Partnership Hawai'i GroupGAP

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