Impacts of Extreme Heat: **Agriculture**

FAS FEDERATION OF AMERICAN SCIENTISTS

Agriculture, food, and related industries produce nearly 90% of the food consumed in the United States and contribute approximately $1.54 trillion to the national GDP. Given the agricultural sector's importance to the national economy, food security, and public health, **Congress must pay attention to the impacts of extreme heat.** To boost the resilience of this sector, **Congress should design strategic insurance solutions, enhance research and data, and protect farmworkers through on-farm adaptation measures.**

Extreme Heat Reduces Farm Productivity and Profitability

Extreme heat threatens agricultural productivity by increasing crop damage, causing livestock illness and mortality, and worsening water scarcity. Hotter conditions can damage crops through **crop sunburn and heat stress**, reducing annual yields for farms by as much as 40%. Animals raised for meat, milk, and eggs also experience increased risks of heat stress and heat-related mortality. For dairy production in particular, an estimated 1% of total annual yield is lost to heat stress alone. Further straining agricultural productivity, extreme heat accelerates water scarcity by increasing water evaporation rates. These higher evaporation rates force farmers to use even more water, drawing often from already stressed water sources. The compounding pressures posed by extreme heat can translate into significant economic losses: a study of Kansas commodity farms found that for every 1°C (1.8°F) increase in temperature, net farm incomes drop by 66%. Together, this means reduced revenue for farms and less food available for people.

Insurance solutions can help mitigate these financial impacts from extreme heat if employed responsibly. Multiple permanently authorized federal programs provide insurance or direct payments to help producers recover losses from extreme heat, including the Federal Crop Insurance Program, the Noninsured Crop Disaster Assistance Program, the Livestock Indemnity Program, and the Emergency Assistance for Livestock, Honey Bees, and Farm-Raised Fish Program. These programs need to ensure that producers are adequately covered against heat-related impacts and incentivize practices that reduce the risk of extreme heat related damages. This in turn will reduce the fiscal exposure of federal farm risk management programs. Congress should **call on the United States Department of Agriculture (USDA) to research the feasibility of incentivizing heat resilience through federal crop insurance rates**. Congress should also consider **insurance premium subsidies for producers who adopt practices that enhance heat resilience for crops and livestock.**

Given the increasing stress of extreme heat on the water systems necessary to sustain agricultural production, **National Oceanic and Atmospheric Administration (NOAA) should build on its Weather, Water, and Climate Strategy and collaborate with USDA on a national water security strategy that accounts for current and future hotter temperatures.** To **enhance system-wide drought resilience**, Congress can also appropriate funds **to leverage existing USDA programs to support on-farm adoption of shade systems, effective water management, cover crops, and soil regeneration practices**.

Finally, there are still notable knowledge gaps around extreme heat and its impacts on agriculture. These gaps include the long-term effects of higher temperatures on yields, farm input costs, and federal program spending. To address these information gaps and guide future research, Congress can **direct the USDA Secretary to submit a report to Congress on the impacts of extreme heat on agriculture, farm input costs and losses, consumer prices, and the federal government's spending** (e.g., federal insurance and direct payment programs for losses of agricultural products and the provision of Supplemental Nutrition Assistance Program (SNAP) benefits).

Extreme Heat Lowers Agricultural Workers' Productivity and Exposes Them to Health Risks

Higher temperatures and resulting heat stress are endangering farmer and farmworker safety and reducing their overall productivity, impacting bottom lines. Farmworkers are essential to the American food system, yet they are among the most vulnerable to extreme heat, facing a 35 times greater risk of dying from heat-related illnesses than workers in other sectors. This risk is intensifying as the sector increasingly relies on H-2A farmworkers, who are hired to fill persistent domestic farm labor shortages. In many regions, over 25% of certified H-2A farmworkers are required to work when local average temperatures exceed 90°F, and counties with the highest concentrations of H-2A workers often coincide with the hottest parts of the country. After the work day, many of these workers return to substandard employer-provided housing that lacks essential cooling or ventilation, preventing effective recovery from daily heat exposure and exacerbating heat-related health risks. On top of the health risks, these conditions make people less effective on the job, which translates to economy-wide impacts: **heat-related labor productivity losses across the U.S. economy currently exceeds $100 billion annually.**

To address these risks, **Congress should pass legislation requiring the Occupational Safety and Health Administration to finalize a federal heat standard that provides sufficient coverage for farming operations**. In tandem with Occupational Safety and Health Administration (OSHA) finalizing the standard, **USDA should be funded to provide technical assistance to agricultural employers for tailoring heat illness prevention plans and implementing cost-effective interventions that improve working conditions while maintaining productivity.** This should include support for agricultural employers to integrate heat awareness into workforce training, resources for safety equipment and education, and support for the addition of shade structures. Doing so would ensure that agricultural workers across both large and small-scale farming operations have access to essential protections, like shade, clean water, and breaks, as well as sufficient capacity to comply. Current funding streams that could have an extreme heat infrastructure "plus-up" include the **Environmental Quality Incentives Program** and the **Farm Service Agency's microloans program.**

Lastly, Congress should also **direct OSHA to continue implementing its National Emphasis Program on Heat,** which enforces employers' obligation to protect workers against heat illness or injury. OSHA should additionally review employers' practices to ensure that H2A and other agricultural workers are protected from job or wage loss when extreme heat renders working conditions unsafe.

The Federation of American Scientists: Who We Are

At the Federation of American Scientists (FAS), we envision a world where the federal government deploys cutting-edge science, technology, ideas, and talent to solve and address the impacts of extreme heat. We bring expertise in embedding science, data, and technology into government decision-making and a strong network of subject matter experts in extreme heat, both inside and outside of government. Through our 2025 Heat Policy Agenda and broader policy library, FAS is positioned to help ensure that public policy meets the challenges of living with extreme heat.

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- Understanding evidence-based policy solutions
- Directing members and staff to relevant academic research
- Connecting with issue experts to develop solutions that can immediately address the impacts of extreme heat

We are tackling this crisis with initiative, creativity, experimentation, and innovation, serving as a resource on environmental health policy issues. Feel free to always reach out to us:

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