# California EPA Should Include Climate Change in Occupational Pesticide Risk Assessments

## Overview

- California is the top agricultural producer in the United States, and farmworkers are a critical component of a healthy agricultural economy; protecting their health will benefit all of us.
- Cal EPA excels in sustainable pest management and has an opportunity to lead the nation in protecting farmworkers from the interconnected impacts of pesticides and extreme heat.
- It has been well established that pesticides may impact farmworkers' health, and increasing evidence suggests climate change and heat may amplify these effects.
- Climate change is increasing 1) the quantity of pesticides used (e.g., altered growing seasons, changing pest patterns, current pesticides becoming less effective with increasing heat); 2) farmworkers' exposure to pesticides (e.g., higher pesticide volatilization and worker sweat rate increase exposure via dermal absorption and inhalation); and 3) farmworkers' susceptibility to pesticides though multiple mechanisms (e.g., decreased PPE use, decreased physiological ability to metabolize chemicals)
- Current national and state pesticide risk assessments do not consider the increasing impacts of climate change, potentially underestimating the risk to farmworkers.

## Key Recommendations:

- DPR should ask the upcoming Environmental Justice Advisory Committee to examine the joint impacts of climate change and pesticides and recommend adaptive strategies to safeguard farmworker health.
- DPR should direct the Worker Safety Regulation Work Group to review the literature on pesticides, heat, and farmworker safety and identify strategies to incorporate these data into pesticide risk assessments, registrations, and regulations.
- DPR and OEHHA should collaborate to revise the current occupational pesticide risk assessment process and incorporate existing and modeled data on the additional impacts of heat on farmworkers' exposure and vulnerability to pesticides.

## Research Findings on Pesticides and Heat

- Occupational pesticide increases the risk of acute and chronic health outcomes, including cancer, respiratory disease, and neurological impacts (1).
- Farmworkers are also particularly vulnerable to Heat-Related Illness (HRI) such as nausea, vomiting, kidney injury, and even death (2).
- Research finds that extreme heat can amplify farmworkers' exposure and vulnerability to pesticides (3). These joint effects will continue to worsen with climate change.
- Farmworkers are often advised to wear Personal Protective Equipment (PPE) to protect against pesticides, however this can also exacerbate physiological strain and the risk of heat stress (4).
- Farmworkers face barriers to accessing healthcare for pesticide- and heat-related health impacts, underscoring the importance of regulations that protect them from these interconnected occupational hazards.

## Testimony from Farmworkers

"What worries me the most is that we are going to be poisoned from pesticides…we don't wear masks because of the temperature and the sun."

"When it is hot outside, I tend to wear the least Personal Protective Equipment for the heat. I only use a sweater, because if I put on more layers, I start sweating so much. I feel suffocated."

"I have had a headache and wanted to vomit because of the heat…you feel the pressure and your head hurts and well, it makes you dizzy." - *Farmworker at 37 weeks pregnant*

# Costs in California and Nationwide

- **Heat-related illnesses increase farmworkers' emergency room visits and hospitalizations**
  - Farmworkers have 35 times greater risk of heat-related mortality compared to the general U.S. workforce (5).
  - There is a nearly 400% increase in heat-related hospitalizations for every 100F increase above mean ambient temperatures in California (6).
  - Nationwide, heat event days are responsible for almost 235,000 ER visits and over 56,000 hospital admissions in the general population, resulting in approximately $1 billion in health care costs each summer (7).
  - These figures may be even greater among farmworkers, who are disproportionately impacted by extreme heat due to their physically demanding occupation that is often outdoors (8).

- **Pesticide exposure causes a range of diseases and chronic complications**
  - It is estimated that farmworkers' pesticide exposures result in approximately $10-15 million per year in healthcare costs (9).

- **Pesticide-related healthcare costs will likely continue to increase as heat impacts the short- and long-term health effects of pesticides.**
  - The joint impacts of pesticides and heat on farmworker health and healthcare costs are probably even greater than these estimates. For example, it is estimated that nearly 75% of non-fatal illnesses and injuries in agriculture may not be counted.10 Due to lack of access to formal healthcare, farmworker illnesses are likely undercounted.

# Regulatory Recommendations

**Recommendation 1:** DPR should ask the upcoming Environmental Justice Advisory Committee to examine the joint impacts of climate change and pesticides and recommend adaptive strategies to safeguard farmworker health.

- DPR should advise this committee, established under AB652, to regularly review climate projections, identify current and emerging risks, and recommend potential adaptive strategies to DPR (e.g., revised pesticide application guidelines, development of climate resilient pest management practices) to protect farmworkers' health
- This committee, to be established by July 1, 2025, should include representation of farmworkers, farmworker advocates and community organizations, individuals with experience in ecological farming, a qualified physician, and an environmental health scientist with expertise in heat and pesticides.

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**Recommendation 2:** DPR should direct the Worker Safety Regulation Work Group to review the literature on pesticides, heat, and farmworker safety and identify strategies to incorporate these data into pesticide risk assessments, registrations, and regulations.

- DPR should direct this group, which includes representation from DPR, OEHHA, DIR, UC ANR, CDFA, and the County Agricultural Commissioners & Sealers Association (CACASA) to identify the current state of the literature on the joint effects of pesticides and heat on farmworker health, identify research gaps, and propose strategies to incorporate existing data and uncertainty into pesticide risk assessments, updated pesticide registrations, and regulations related to pesticides and farmworker health.

**Recommendation 3:** DPR and OEHHA should collaborate to to revise the current occupational pesticide risk assessment process and incorporate existing and modeled data on the additional impacts of heat on farmworkers' exposure and vulnerability to pesticides.

- As the two California EPA entities responsible for pesticide risk assessment, DPR and OEHHA should revise the current risk assessment process to incorporate existing and modeled data on the impacts of heat on occupational pesticide risk characterization. This could include a climate change-related uncertainty factor.
- This updated risk assessment framework should integrate advanced modeling techniques to better predict short- and long-term health impacts from co-exposures to pesticides and extreme heat, particularly among highly exposed groups such as farmworkers and those living in agricultural communities.
- Potential outputs of this revised risk assessment process could include more frequent updating of pesticide risk assessments, increased monitoring for pesticide food residues as climate change alters pesticide use, and support for additional toxicological research and modeling studies (11).
- These efforts would support DPR's Sustainable Pest Management Roadmap (12) that promotes efforts to develop and fund more sustainable approaches to pest management in California agriculture.

## Program Information

The “Reach the Decision Makers” program, coordinated and funded by the Environmental Research and Translation for Health Center at the University of California, San Francisco, helps participants develop the skills and tools necessary to effectively engage California EPA.

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