

PRECARIOUS PROTECTION

Analyzing Compliance with Pesticide Regulations for Farmworker Safety



Center for Agriculture & Food Systems
VERMONT LAW & GRADUATE SCHOOL



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EXECUTIVE SUMMARY

Everyone deserves a workplace that prioritizes their health and safety. Unfortunately, farmworkers seldom find themselves in such a work environment. Pesticide exposure is one of the major threats these workers encounter, with health impacts ranging from the acute to the chronic. These risks extend beyond the fields. Pesticide residue frequently travels home with workers and exposes their families.

The Worker Protection Standard (WPS) is the main federal regulation intended to address the risks associated with pesticide-related illness and injury among farmworkers. The Environmental Protection Agency (EPA) established and enforces the regulation.

Compliance with the WPS should reduce pesticide risks to workers. Unfortunately, many farms do not comply with the WPS. The actual rate and quality of compliance is difficult to assess. As detailed in *Exposed and at Risk*, state and federal enforcement data are unreliable. Still, the reported data provide some insight into compliance rates. In 2021, states inspected 3,092 facilities and recorded 1,491 violations; tribes inspected 40 facilities and noted one violation; and the EPA inspected no facilities. Surveys and qualitative research also indicate that many employers do not fully comply with the WPS, though much more research is needed. There are also shortcomings with the WPS. No evaluation of the standard's effectiveness has ever taken place.

The EPA supports and monitors compliance through a variety of cooperative agreements with universities, community-based organizations, and state enforcement agencies. Stakeholders have critiqued the execution of some of these functions, and there are opportunities for improvement.

EVALUATING THE WPS AND COMPLIANCE

This section summarizes key components of the WPS and current shortcomings.



Training for Employees

The 2015 revision to the WPS increases the frequency of training to be annual (from five years previously), requires that training take place before any work commences, and adds new subject matter. Issues with the status quo include:

- Most employers provide training through video, which offers little to no engagement with the material.
- The more engaging, facilitated trainings reach just a small proportion of workers.
- The WPS does not include any measures to verify retention or comprehension of the critical safety information presented through the training.
- The WPS does not require any refresher trainings for workers during the season or for certified pesticide applicators who may administer the training.
- Some workers are not receiving training at all.



Access to Information

Employers are required to display, maintain, and record certain information on pesticide applications and pesticide safety to keep workers informed of the risks. Current challenges include:

- Some employers are not properly posting safety information in a central location.
- The central location selected may not be in a place where workers regularly congregate.
- Language barriers can limit access to information where a translation is not provided.
- The posting of outdated information undermines trust in the information displayed.
- The WPS does not require employers to display information through maps, diagrams, or other pictorial formats that would be easier to understand.



Entry Restrictions: Application Exclusion Zone

First established in the 2015 revision to the WPS, the Application Exclusion Zone (AEZ) is a no-entry area that surrounds pesticide application equipment in all directions. The size of the AEZ depends on the application type. If anyone enters the AEZ, the handler must suspend the application. Challenges with the status quo include:

- Pesticide drift occurs beyond the AEZ radius.
- Drift can reach worker housing, which often is not well-insulated.
- State officials report challenges in monitoring compliance with the AEZ and documenting violations.
- Some employers are confused about their obligations because of changes the Trump Administration tried to make to the standard, even though those changes never went into effect.



Entry Restrictions: Restricted-Entry Interval

The Restricted-Entry Interval (REI) is a time period following the application of any pesticide to an area of outdoor production. During the REI an agricultural employer must keep workers out of the “treated area.” The rule also requires warning signs or oral notification to workers, depending on the circumstance. Issues with the status quo include:

- Some employers and farm managers send workers into treated areas too early.
- Posted warning signs often remain in place after the REI ends. Workers become accustomed to seeing outdated signs in the field and cannot tell when they should take the sign seriously.
- There are exceptions to the REI that allow employers to send workers back into treated areas during the period in which the risk of harmful pesticide exposure is most acute.



Personal Protective Equipment

Employers must provide Personal Protective Equipment (PPE) to pesticide handlers and early entry workers to minimize their exposure to pesticides. Issues with the status quo include:

- Many workers who may encounter pesticide residues are left out of this requirement.
- Uncomfortable or poor-fitting PPE, insufficient PPE available, workplace norms, and poor training can decrease use of PPE.
- In high temperatures, workers can face increased medical risks if they exert themselves while wearing PPE.



Decontamination Supplies

Employers must provide, in a reasonably accessible location, a means to wash off pesticides and pesticide residues for workers who come in contact with anything that has been treated with a pesticide, including soil, water, and plants. Current deficits include:

- Decontamination supplies are often too far from the workers’ location.
- Poor planning or neglect can lead to avoidable deficits.
- Workers may be discouraged from using decontamination supplies due to short or nonexistent breaks and workplace norms.
- Workers may be less likely to engage in washing as a protective behavior as compared with other protective behaviors, like wearing protective clothing.



Emergency Assistance

Employers must provide workers with prompt transportation to a medical facility when there is suspected pesticide exposure or the worker has symptoms of pesticide exposure, such as fever, vomiting, chills, and dizziness. Compliance deficits with this requirement include:

- Workers often do not know that their symptoms reflect pesticide illness rather than another illness. If an employer does not tell workers about an application, the worker may also not have the information needed to link their symptoms to pesticide exposure.
- Workers fear retaliation, termination of a work visa, or deportation will result if they seek medical attention.
- Employers often do not have an emergency plan or injury and illness prevention plan in place, which can leave managers unaware of what steps to take when an incident occurs.
- Medical facilities and services are sparse in rural areas where most farms are located, adding inconvenience and transportation times as deterrents.

FACTORS SHAPING THE COMPLIANCE LANDSCAPE

Various factors, systems, and entities influence WPS compliance among growers. These factors include:

- **Socio-cultural factors affecting growers:** Growers often perceive the health risks affiliated with pesticides to fall on pesticide handlers and not with workers engaged in other tasks. Older growers accustomed to more lenient requirements and lax enforcement, as well as smaller operations with more constrained resources, may lack the motivation to come into compliance.
- **Socio-cultural factors affecting workers:** There is wide variation in worker perception of the risks that pesticides pose to their health. There is also variation in awareness of pesticide use and exposure in the workplace. Language barriers can limit access to information and understanding of these risks. Uneven power dynamics and fear of retaliation hinder workers' ability to hold employers accountable.
- **Economic considerations facing growers:** The costs associated with the WPS requirements are relatively minor. However, a grower's experience of increasing regulatory costs in general may deter compliance. The low penalties and low risk of receiving a penalty for violations do little to incentivize compliance.
- **Workers' compensation:** Some states require agricultural employers to carry no-fault insurance coverage for work-related illnesses and injuries. This requirement can encourage compliance because workplace injuries increase insurance costs.
- **Anti-retaliation and confidential reporting:** The WPS prohibits employers from retaliating against employees. However, workers still fear retaliation, and the WPS does not guarantee confidentiality when a worker reports a violation.
- **H-2A Visa Program:** The H-2A program allows qualifying U.S. growers to hire foreign nationals to fill temporary agricultural positions when they face a labor shortage. The H-2A regulations do not require "know your rights" training or that workers receive safety information when they arrive at their job.
- **Farm labor contractors:** The presence of a farm labor contractor can encourage exploitation by obscuring employment relationships and responsibilities. In the WPS context, the rule is clear that the ultimate responsibility for WPS compliance lies with the agricultural employer—defined as the owner or manager of the agricultural establishment.
- **Private compliance oversight:** In the absence of robust government oversight, private initiatives have stepped in to play an oversight role as well. These include **worker-driven social responsibility** programs, **unions**, and **third-party verification programs**.
- **Organics:** Although organic growers tend to use fewer chemicals, they may still use substances that require compliance with the WPS. Organic certification does not include any labor standards, so "organic" does not necessarily mean "safe" for workers. Still, organic agriculture *can* help protect farmers and farmworkers by reducing exposure to most toxic synthetic pesticides.

RECOMMENDATIONS

This final section summarizes the authors' recommendations to improve the WPS and compliance. Further background on the issues described in this Executive Summary, support for these recommendations, and additional recommendation detail can be found in the full-length report.

Overarching Recommendations

- Commission the development and inclusion of additional pesticide-related questions in the National Agricultural Workers Survey to provide a better understanding of WPS compliance and implementation on the ground.
- For EPA administration of cooperative agreements:
 - Incorporate stakeholders in the development of requests for applications and more precisely specify priority activities, deliverables, and processes for applicants.
 - Consider administering smaller-scale cooperative agreements so that grantees can focus attention and energy on a narrower set of activities.
 - Collaborate with recipient organizations to develop a public-facing work plan that is published on the EPA's website and updated with progress reporting at regular intervals.
 - Encourage partnerships that bring a range of expertise to projects, ensuring that community-based organizations play a significant or lead role in steering projects that aim to benefit farmworker communities.
- Support research examining the efficacy of compliance monitoring activities conducted by bilingual and monolingual (English-speaking) inspectors.
- Support the education, training, and recruitment of bilingual inspectors and move toward making language skills a job requirement.
- Engage in a national campaign, tailored to each region, to raise awareness of these obligations and their importance.
- Evaluate the WPS overall and its individual components for protecting and promoting farmworker health and safety.
- Amend the Federal Insecticide, Fungicide, and Rodenticide Act to include a private right of action for WPS violations, with civil penalties recoverable by the workers put at risk.



Training for Employees

- Involve farmworkers, farmworker organizations, and WPS trainers in EPA-funded projects that design, develop, review, and evaluate WPS training materials.
- Incorporate evidence-based approaches to design and evaluate effective training.
- Encourage or require that farmworker training be provided in an appropriate and engaging format and that it be culturally and geographically relevant.
- Encourage or require refresher training for non-certified trainers.
- Encourage or require that certified applicators be educated in effective training methodologies.
- Encourage or require that workers receive refresher trainings (i.e., tail-gate trainings) on pesticide safety regularly.
- Work on developing best practices in partnership with farmworkers and grassroots organizations to improve upon industry and regulatory standards in the future.
- Consider incentives that encourage employers to meet their obligations by allowing nonprofit and grassroots organizations to provide training with sufficient, dedicated paid work time.



Access to Information

- Encourage or require that the central display information include the application area in picture format.
- Conduct surveys or focus groups with farmworkers to gather input on the most effective way to communicate safety information and collaborate with community-based organizations to ensure accessibility and cultural relevancy of safety materials.
- Encourage or require pesticide safety information to be posted at additional locations, such as water stations, bathrooms, worker transportation, and worker housing.
- Encourage or require pesticide application information to be conveyed in the languages understood by workers at that operation.
- Provide safety and application information in several languages in pocket-sized cards and a mobile-friendly format so workers can carry it with them.
- Encourage or require growers to permit use of mobile phones for information retrieval at the worksite and allow worker use of grower Wi-Fi networks, where available, to enable access.
- Expand the fifth iteration of the Pesticide Registration Improvement Act (PRIA 5) bilingual pesticide labeling requirement to include directions for use.
- Expand the PRIA 5 bilingual pesticide labeling requirement to include languages in addition to Spanish.
- Encourage or require growers to post the bilingual pesticide information and/or the corresponding QR code along with the application information in a central location and at various worksite locations where workers are present.
- Encourage or require that the central display reminds the worker that they have access to the record for two years and provides information on how to request it.



Entry Restrictions

- In the near term, finalize the 2023 AEZ proposed rule, putting to rest any lingering confusion regarding the applicability of the 2015 Rule's provisions.
- Longer term, increase the AEZ radius and lengthen its application window as a precautionary and more protective approach.
- Ensure that farmworkers' housing facilities provide adequate protection against pesticide drift infiltration.
- Establish buffer zones around farmworker housing where pesticides may not be sprayed. Require employers to provide alternative housing or accommodations if a buffer zone cannot be maintained.
- Encourage or require advance notification of farmworker housing residents so that workers can take precautions and/or leave temporarily.
- Encourage or require posting of warning signs along the path of an AEZ that extends into public thoroughways beyond the establishment.
- Require REI warning signs to include the date and time at which the relevant entry restriction commences and ceases.
- Require REI warning signs to include the name of the pesticide and product involved in the application.
- Encourage or require warning signs for applications with an REI greater than 24 hours.
- Encourage or require employers to document the method, location, date, and time that warnings were communicated to workers.
- Rescind the "agricultural emergency" and other early reentry exceptions to the REI requirements and review alternative means for agricultural establishments to recover losses from "agricultural emergencies" through insurance or indemnification rather than putting workers in jeopardy.
- Fund research, or commission an additional unit in the NAWS, to better document the incidence and cause of REI violations and current use of the REI exceptions.



Personal Protective Equipment

- Encourage or require certification from the worker that their employer has provided them with properly fitting PPE and/or the worker has access to the employer-provided PPE they need at the facility.
- Encourage or require employers to make gloves and clothing storage and changing areas available to all workers.
- Provide regular grant funding for agricultural producers to purchase PPE for employees, along with outreach and education and technical assistance for PPE provision.
- Support research to develop effective auxiliary cooling system PPE, such as cooling garments, made from lighter materials that workers can wear comfortably in the heat without risking heat illness.
- Support research to examine the distinct PPE needs of women and minors.



Decontamination Supplies

- Provide grant funding through the USDA to support development and implementation of carriers or devices that can better mobilize decontamination supplies, water and cups, and temperature-controlled food storage through the fields.
- Ensure that WPS training adequately and sensitively provides education concerning the importance of washing behaviors to reduce pesticide exposure, in a manner that respects the presently held beliefs of some workers concerning bodily health and safety.
- Guarantee workers compensated at a piece-rate wage receive at least the applicable minimum wage for all hours at work.
- Require workers to be compensated for breaks and non-productive time (e.g., washing, donning and doffing PPE) separate from their piece-rate compensation.



Emergency Assistance

- Provide employers with pocket-sized cards that list pesticide illness/poisoning symptoms and supervisor and emergency medical services information for workers to carry with them (and present when receiving medical care).
- Train employers and supervisors to recognize pesticide exposure symptoms.
- Encourage or require employers to have and regularly test an emergency plan or an illness and injury prevention plan that details what to do in the event of a suspected pesticide exposure, including whom to call and how to transport employees to medical facilities.
- Require health centers that receive federal funding to maintain and provide information and resources concerning pesticide exposure, including risk mitigation, exposure and symptom recognition, rights and protections, treatment, and health risks.
- Expand resources for mobile health clinics so they are equipped to serve the diverse farmworker community.
- Encourage or require employers to provide workers compensation or compensate workers for time spent seeking medical attention and for recovery time for pesticide illness or injury.
- Provide grant funding and resources to support provider training on identifying and treating pesticide illness/poisoning and research that would help providers more quickly and accurately diagnose and treat patients.



Shaping the Compliance Landscape

- Expand workers' compensation coverage for agricultural workers in all states.
- Amend the Federal Insecticide, Fungicide, and Rodenticide Act to provide stronger retaliation protections for workers (e.g., reinstatement, back pay, other damages).
- Establish confidentiality protections for workers reporting WPS violations.
- Amend the H-2A regulations to specifically refer to the WPS and its general provisions as program requirements that must be disclosed in the work contract.
- Amend the H-2A regulations to require additional disclosures and training regarding workers' rights and protections broadly, including the WPS.
- Amend the H-2A regulations to reduce isolation of workers by assuring that workers are allowed to have visitors at their housing locations, even if visits have to be limited to outdoor areas during a pandemic.
- Establish exit-interview procedures with H-2A workers that include inquiry into a grower's practices regarding pesticides and compliance with the WPS, with guaranteed confidentiality.
- Increase coordination and shared authorities among state inspection officials charged with enforcing laws related to workers on agricultural establishments (e.g., H-2A housing inspections and WPS compliance).
- Encourage grower participation in Worker-Driven Social Responsibility programs through incentives, procurement preferences, and education about the benefits these programs offer to workers and growers.
- Establish a federal floor protecting farmworker labor organizing that permits state law to go further and that does not preclude entry into or enforcement of supply chain agreements.
- Amend the regulation governing organic system plans to require growers to identify products that trigger WPS requirements and certify their understanding of their obligations under the WPS.
- Increase the EPA's outreach to organic growers, through collaboration with USDA, to ensure that organic growers are aware and informed of their responsibilities to comply with the WPS.
- Continue and increase funding for USDA's Organic Transition Initiative and cost-share programs to encourage organic transitions, while encouraging and promoting sound labor practices on organic farms.

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USDA Photo
by Lance Cheung

INTRODUCTION

EVERYONE DESERVES A WORKPLACE THAT PRIORITIZES THEIR HEALTH AND SAFETY.

Unfortunately, the farmworkers planting, tending, harvesting, and packing the nation's food seldom find themselves in such a work environment. Pesticide exposure is one of the major threats these workers encounter, with health impacts ranging from the acute to the chronic.¹ These risks extend beyond the fields, as pesticide residue can travel home with workers and expose their families.

Compliance with the Worker Protection Standard (WPS) should mitigate these risks. However, adherence to the WPS requirements varies among farms and enforcement can be inconsistent. These factors, coupled with the use of highly toxic pesticides (such as certain organophosphates and paraquat)² and shortcomings with the standard itself, limit WPS efficacy. Making workplaces safer will require stronger enforcement and monitoring, enhanced understandings of compliance, shifts in workplace norms, and changes to governing policies. However, even these enhancements will not eradicate the risks, an achievement that would require eliminating the use of dangerous pesticides entirely.

This report is the third publication in a series of reports on farmworker health and safety led by the Center for Agriculture and Food Systems at Vermont Law and Graduate School. The first report, *Essentially Unprotected*, explored gaps in U.S. laws and policies that put farmworkers at risk, specifically focusing on the workplace hazards of pesticide exposure and heat-related illness. The second report, *Exposed and at Risk*, outlined how enforcement of pesticide safety regulations is weak and proposed policy solutions for addressing the factors contributing to this deficit. Among other things, that report found:

- Minimal EPA oversight—or meaningful standards—for state pesticide programs means enforcement activities can vary widely between states.
- The rate of WPS inspections is low, and many inspections are suboptimal or not thorough enough.
- Systemic reporting issues make it challenging, if not impossible, to rely on publicly available WPS enforcement data.
- Conflicting responsibilities of enforcement bodies in certain states may stymie the efficacy of WPS enforcement.³

Building from these earlier publications, this report takes a closer look at what compliance with the WPS means on the ground, how well growers and workers meet the WPS requirements, and the current shortcomings. It examines the support systems in place to help growers understand and meet their obligations and farmworkers' access these protections. To help synthesize this report's findings with the *Exposed and at Risk* report, our team focused on the states of California, Washington, Florida, and Illinois for research and stakeholder engagement. However, to diversify the scope further, this report also includes a focus on North Carolina, Oregon, and New York. These states were selected due to their substantial farmworker population and the availability of resources and/or research concerning pesticide compliance within the state.

The authors hope the findings and recommendations in this report equip advocates, workers, and policymakers with a fuller understanding of the policy landscape and generate ideas for how to improve and amend current policies and practices so that workers' health and safety is protected and respected in the workplace.

This report begins by summarizing the WPS and the history of its development. It then discusses rates of compliance and the challenges in measuring compliance. The next section turns to the programmatic infrastructure that supports WPS compliance, including the funding and resources sponsored by the EPA for pesticide safety education. The report then outlines the main components of the WPS and takes a closer look at its requirements and the challenges specific to meeting them, and provides recommendations for reform. The next section examines some of the other dynamics and structures in the United States that directly and indirectly influence compliance. The report concludes with a set of recommendations for reform.



David Bacon

WHAT IS THE WORKER PROTECTION STANDARD?

AS DETAILED IN THE PRIOR REPORTS, THE WPS IS THE MAIN FEDERAL REGULATION INTENDED TO ADDRESS THE RISKS ASSOCIATED WITH PESTICIDE-RELATED ILLNESS AND INJURY AMONG FARMWORKERS.⁴ The Environmental Protection Agency (EPA) promulgates the WPS under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), which requires all pesticides to be registered with the EPA prior to distribution or sale within the United States. The responsibility for implementation and enforcement of FIFRA, and in turn, the WPS, falls to the EPA. However, the EPA has delegated nearly all pesticide use enforcement to individual states through cooperative agreements.⁵ In practice, the EPA sets the standard and states carry out most enforcement and oversight over regulated entities, leading to the variation noted above and in *Exposed and at Risk*. States may also issue and implement heightened safety standards related to pesticide use so long as the WPS floor is met.



Although the Occupational Safety and Health Act (OSH Act) grants the federal Occupational Safety and Health Administration (OSHA) authority to regulate workplace safety generally and applies to almost all privately employed workers, pesticide safety is a notable exception. OSHA first acted to institute temporary emergency pesticide safety standards in 1973. However, the EPA effectively usurped OSHA's jurisdiction over this hazard when it issued the WPS in 1974. OSHA's governing statute bars it from regulating workplace hazards that fall under another agency's jurisdiction.⁶

The WPS requires agricultural employers whose operations involve farms, forests, nurseries, and greenhouses (i.e., an “agricultural establishment”) to implement certain policies and practices to prevent or at least reduce worker exposure whenever a FIFRA-regulated pesticide is used in agricultural production.⁷ The requirements are designed to protect two types of employees:

1. agricultural workers, those who perform hand-labor tasks in pesticide-treated crops
2. handlers, those who mix, load, and apply pesticides⁸

This report primarily focuses on the conditions pertaining to agricultural workers, or farmworkers. To a lesser extent, the report considers the conditions facing workers who also engage in pesticide handler activities (e.g., applying or assisting in the application of pesticides) as part of their job duties, but it excludes discussion of other types of handlers such as commercial and private applicators.

The full list of WPS requirements may be found in the Code of Federal Regulations, Title 40, Part 170 and are summarized on the EPA’s “Agricultural Worker Protection Standard (WPS)” webpage.⁹ This report focuses on the following key components, which are described in greater detail in their corresponding sections:

■ Inform

- **Training:** Workers must receive an EPA-approved pesticide training annually.
- **Access to Information:** Employers must display pesticide safety information at a central location and at decontamination sites and must display application-specific information and Safety Data Sheets within 24 hours of an application, before workers enter a treated area.

■ Protect

- **Entry Restrictions:** Employers must prohibit entry into the treated area or the **Application Exclusion Zone (AEZ)** (a no-entry area surrounding the application equipment) during pesticide application and implement **Restricted-Entry Intervals (REIs)** to prevent entry into treated areas.
- **Personal Protective Equipment (PPE):** Employers of pesticide handlers and early-entry workers must provide and maintain the personal protective equipment required by the pesticide product label.

■ Mitigate

- **Decontamination Supplies:** Employers must provide a minimum amount of water for workers and handlers, as well as soap and single-use towels, for decontamination purposes.
- **Emergency Assistance:** For a worker or handler who may have experienced pesticide exposure during employment, the employer must provide prompt transportation to an appropriate medical care facility for treatment and provide necessary information to the treating health care providers.

The EPA codified the current WPS requirements in the agency’s comprehensive update to the WPS in 2015 (the 2015 Rule). Most of those requirements became effective in January 2017.¹⁰ Although the EPA sought to weaken aspects of the AEZ requirements in 2020, a court order stayed the effective date of those changes.¹¹ The EPA has since proposed reinstating most of the 2015 AEZ requirements that the 2020 rule would have weakened or eliminated and, as of September 2023, is still considering comments on that proposal.¹² Despite this administrative back and forth, requirements on the ground have remained largely consistent since 2017 because the 2020 rule never took effect.

The federal regulations set the floor for workplace safety standards, but states may enact stricter safeguards.¹³ Of the seven states examined for this report, five—California, Washington, Oregon, New York and Florida—have developed additional requirements beyond the federal WPS on issues such as notice, training, and PPE requirements (**California**), decontamination provisions (**Washington**), workers’ access to pesticide application records and Safety Data Sheets (**Florida**), and longer AEZ distance and duration (**Oregon**).¹⁴ Also, in **Oregon**, training must be made available to adult occupants of agricultural housing facilities in addition to workers.¹⁵ Other states, including **Illinois** and **North Carolina**, have chosen to simply incorporate the EPA’s WPS requirements and go no further.



David Bacon



WPS History

The WPS requirements have evolved over the years. The first WPS, promulgated in 1974, focused on farmworkers performing hand labor on farms and prohibited pesticide applications when unprotected workers are present, restricted the timing of unprotected worker reentry after application, required certain protective clothing for workers reentering treated fields early, and required that workers be given timely and appropriate warnings of application.¹⁶ Finding that the initial standard offered inadequate protection and noting the increasing use of (even) more acutely toxic pesticides, the EPA embarked on a lengthy (eight-year) negotiation and input process to improve the rule from 1984 to 1992.¹⁷

The agency initially attempted to revise the standard through a “regulatory negotiation” process (a process that brings together different interests groups to reach consensus on a proposed rule) with a 25-member federal advisory committee that included representatives from farmworker unions, health care providers, agricultural trade associations, commercial pesticide applicators, pesticide registrants, and state and federal agencies.¹⁸ Representatives included California Rural Legal Assistance, East Coast Farm Worker Support Network, Farm Labor Organizing Committee-Florida, Farm Labor Organizing Committee-Ohio, Arizona Farm Workers Union, United Farm Workers of America (AFL-CIO)-Texas, and National Farm Workers Health Group.¹⁹ After several months and meetings, the large majority of these farmworker representatives withdrew from the process, preventing a consensus on the requirements.²⁰

The EPA held additional meetings to collect input on the draft rule, finally releasing its proposal in 1988 before finalizing it in 1992. The 1992 update included provisions for handlers in addition to workers and broadened workers to include those performing cultivation and harvesting tasks in nurseries, greenhouses, and forests.²¹ The agency promulgated its revision in 1992 with provisions designed to: “(1) [e]liminate or reduce exposure to pesticides; (2) mitigate exposures that occur; and (3) inform employees about the hazards of pesticides.”²² To eliminate or reduce exposure, the rule included application restrictions, personal protective equipment requirements, entry restrictions, and notification requirements. To mitigate exposure, it included decontamination and emergency assistance requirements. Finally, to inform employees, it required worker pesticide safety training and access to pesticide-specific information. That rule was not fully implemented until 1995.²³

The next major update in 2015 retained much of the 1992 structure but established a minimum age requirement for handlers and early-entry workers, no-entry AEZs, application suspension requirements, an annual training requirement (with additional topics and a requirement that the training be EPA-approved), and recordkeeping requirements in addition to tightening up or amending other existing requirements.²⁴ As noted on page 50, although the EPA released a rule modifying the AEZ requirements in 2020, the Southern District of New York stayed the effectiveness of that rule, and so the AEZ requirements from the 2015 Rule have remained operative.²⁵



David Bacon

MEASURING COMPLIANCE

- **Rate of compliance:** The proportion of employers that adhere to the WPS generally, or to a specific WPS requirement, in each region.
- **Quality of compliance:** For a given employer or group of employers, the degree of adherence to the WPS requirements generally or to a specific WPS requirement.

ANECDOTALLY, EMPLOYER COMPLIANCE WITH THE WPS VARIES WIDELY AND IS GENERALLY LOW OR POOR IN MANY GEOGRAPHIC AREAS. Unfortunately, the rate and quality of employer compliance with the WPS is difficult to assess. The best source for this data should be state and federal regulators who conduct compliance monitoring and inspect worksites to evaluate compliance and document violations. However, as detailed in *Exposed and at Risk*, these datasets are unreliable for several reasons.

First, regulators inspect a very small percentage of WPS-regulated agricultural operations in any given year. The EPA estimates that there are approximately 304,000 agricultural operations employing workers and handlers protected by the WPS.²⁶ State agencies conduct the vast majority of inspections; for instance, in 2019, states conducted 3,407 inspections, while tribes conducted 56 inspections, and the federal EPA conducted 12.²⁷ Because these inspection figures include inspections of both agricultural operations and commercial handlers (together totaling 346,000 facilities),²⁸ this means that just one percent of WPS-regulated entities received an inspection that year. Observations drawn from this sample—which is not clearly representative or appropriately random—cannot establish the rate or quality of WPS compliance on operations nationwide. Increased funding and resources for agencies to conduct inspections is needed.

There is also reason to doubt the accuracy and completeness of the data EPA shares on its WPS Dashboard. As the *Exposed and at Risk* authors reported, there are substantial discrepancies in state-reported and EPA-reported statistics.²⁹ In many cases, states do not make (useful) enforcement data publicly available, thereby limiting observers' ability to evaluate compliance using the EPA WPS Dashboard for a given state. Separate from the Dashboard, which is populated with inspection data, the EPA recently made 10 years of pesticide incident data publicly available and announced that it will update the data monthly going forward.³⁰ This dataset includes raw data on reported pesticide exposure incidents. While this release is a positive step toward greater transparency (and will decrease reliance on requests under the Freedom of Information Act (FOIA)), the raw data's utility is still quite limited in its ability to present a comprehensive picture of WPS compliance nationwide.

Current inspection practices cast further doubt on the quality and completeness of the data collected. Enforcement agencies initiate inspections either “for-cause” (i.e., due to a complaint received) or as part of a “neutral scheme.”³¹ A neutral scheme establishes a plan for monitoring activities that relies on non-arbitrary, objective criteria to determine which establishments to inspect. For example, an officer might randomly select a geographic location in the state and visit each of the farms within a certain radius. These inspection protocols may not effectively uncover violations, however, and even if they do reveal violations, they often result in warnings rather than fines.³² Although a complaint may prompt a “for-cause” inspection, workers have little incentive to file a complaint (see discussion regarding retaliation on page 75, *infra*). No monetary award or compensation accompanies a meritorious complaint and workers risk retaliation and blacklisting from future employment opportunities for making such a report even if the employer is cited for a violation.³³ Further, while the EPA's Office of Enforcement and Compliance Assurance counsels that “for-cause” inspections should be initiated as soon as possible after a complaint, there is no mandate that they occur within a certain time period.³⁴

Despite these drawbacks, existing enforcement data provides some insight into compliance rates and the predominant violations recorded. In 2021, the EPA WPS Dashboard shows that states inspected 3,092 facilities and recorded 1,491 violations; tribes inspected 40 facilities and noted one violation; and the EPA inspected no facilities.³⁵ Unfortunately the WPS Dashboard does not indicate how many violations were found per facility, so it is not possible to determine what proportion of inspected facilities were found to be noncompliant. Of the violations recorded, we can see which elements of the WPS appeared to face the biggest challenges.

Number of WPS Violations Reported to EPA by Year³⁶
(all enforcement bodies)

	2019	2020	2021
Training	603	418	413
Central Posting	600	336	437
Notice of Application	152	125	82
Field Entry	49	29	70
PPE	227	173	218
Applicator Safety	34	17	59
Decontamination Supplies	171	100	151
Emergency Assistance	16	4	7
Application Information	53	44	55
Retaliation	0	1	0

Although the data suggests that growers are most frequently noncompliant with the training and central posting requirements, compliance with these requirements is more easily determined during an inspection. An inspector can physically see whether required information is posted in a central location on site and can review the required training records to determine whether the training has been documented. Advocates, however, have repeatedly heard from workers who were pressured to sign training documents even though no training had been provided. Inspecting the facility and worksites (field or application site) for proper stocking, storage, and provision of PPE and decontamination supplies is also relatively straightforward. It is much more difficult to determine whether workers have entered treated fields prematurely, received notice of pesticide application, received emergency assistance when needed, or faced retaliation. Such findings rely on workers filing complaints or being forthright with inspectors during inspections. As described throughout this report, power imbalances, language barriers between workers and inspectors, fear of retaliation, diminished memories over time, and other factors can prevent such reports from occurring.

In addition to enforcement data, surveys and qualitative research can shed light on the state of compliance. Commissioned by the Department of Labor, the National Agricultural Workers Survey (NAWS) is a nationwide survey of crop workers (excluding H-2A workers) that is perhaps the best source of information about our nation’s farmworkers, obtained directly from workers themselves. Although the survey only includes one question related to pesticide

safety, it is a helpful proxy. The survey “asks respondents whether, at any time in the last 12 months, their current employer provided them with training or instruction in the safe use of pesticides;” workers responded affirmatively at a rate of 68 percent in 2019–20, indicating that a sizable proportion of agricultural employers are out of compliance with the WPS, at least with respect to training.³⁷ This survey may also overestimate compliance rates and underestimate noncompliance given that the NAWS relies on employer consent to survey employees.³⁸ Other research offers insight at a smaller scale. Studies over the years have documented low rates of training on farms in **Oregon, North Carolina, Texas, and California**.³⁹ More research is needed to evaluate implementation of and compliance with the 2015 Rule, as data regarding worker training prior to implementation provides limited, though useful, insight.

Stakeholders interviewed for this report consistently expressed a belief that WPS compliance remains low, describing compliance rates as “minimal”⁴⁰ and “probably very low.”⁴¹ Several stakeholders suggested that the growth of the H-2A visa program constitutes one of the biggest issues with compliance. The H-2A visa program permits agricultural employers to recruit and hire foreign workers for temporary, seasonal agricultural work on their operations. Some stakeholders remarked that H-2A workers in their region are not receiving the training, equipment, or access to information they are supposed to have.⁴² Other stakeholders surmised that compliance rates may actually be greater among H-2A employers due to their size and the heightened regulatory scrutiny involved in participating in the program (see further discussion of the H-2A visa program on page 76, *infra*).⁴³ Additionally, several stakeholders expressed frustrations about the quality of compliance, owing to an insufficient number of WPS inspectors, low fines for violations, lack of awareness of the WPS among workers and growers, and employers’ hesitancy to seek compliance support from agencies for fear of triggering an inspection.⁴⁴





David Bacon

SUPPORTING COMPLIANCE

AS THE AGENCY CHARGED WITH OVERSEEING PESTICIDE SAFETY FOR WORKERS, THE EPA SUPPORTS A VARIETY OF PESTICIDE SAFETY INITIATIVES THROUGH COOPERATIVE AGREEMENTS WITH UNIVERSITY PARTNERS AND NONPROFIT ORGANIZATIONS.

Additionally, the agency, as well as other public and private entities, makes available various resources to guide employers on their WPS compliance obligations. Growers may also receive individualized support on pesticide safety compliance that is tailored to their operation. This section provides an overview of these various support systems.

EPA Support for Pesticide Safety

The EPA’s Office of Pesticide Programs (OPP) administers funding to support pesticide safety activities. The Pesticide Registration Improvement Act (PRIA), first passed as part of the Consolidated Appropriations Act of 2004 and now on its fifth iteration (PRIA 5), established a pesticide registration and fee system that authorizes the EPA to assess fees on pesticide manufacturers and distributors that contribute funding to the EPA’s pesticide regulatory activities.⁴⁵ Congress directed that a portion of the fees collected be reserved to enhance scientific and regulatory activities related to worker protection.⁴⁶ In the latest reauthorization, Congress authorized the use of funds for the following relevant activities:

- Up to \$7.5 million (over FY2023–27) in grants to facilitate farmworker training and education through grants to community-based, nonprofit farmworker organizations.⁴⁷
- Up to \$2.5 million (over FY2023–27) in grants for activities that support health care providers in recognizing, treating, and managing pesticide-related injuries and illness.⁴⁸

- Up to \$1.75 million (over FY2023–27) in grants for technical assistance to support grantees and applicants for the farmworker and health care provider grants noted above.⁴⁹
- Up to \$500,000 (each year, FY2023–27) to carry out the Pesticide Safety Education Program.⁵⁰
- Up to \$500,000 (each year, FY2023–27) to support the Sentinel Event Notification System for Occupational Risk (SENSOR) Pesticides program, a program led by the National Institute for Occupational Safety and Health (NIOSH) to support state departments of health in pesticide illness and injury surveillance and reporting.⁵¹

The EPA implements the purposes of this funding through cooperative agreements. The main agreements, detailed in the following table, rely on both PRIA and discretionary funding for support.

Relevant Cooperative Agreements⁵²

COOPERATIVE AGREEMENT TITLE	RECIPIENT	GENERAL PURPOSE	LENGTH/ACTIVE / INACTIVE (YEAR COMPLETE)	AWARD AMOUNT
Project to Advance the Safe Use of Pesticides/ Pesticide Educational Resources Collaborative 2.0 (PERC)	University of California, Davis and Oregon State University	Develop materials and resources that “support safe pesticide use and implementation of the [WPS] and the Certification of Pesticide Applicators (CPA) regulations,” including through materials development, outreach activities, technical assistance, training and education, or other activities. ⁵³ Administer Agricultural Community-Based Project Grants program (next table).	5 years Active (Through June 2026)	\$6,000,000
National Farmworker Training Program	Association of Farmworker Opportunity Programs (AFOP)	Develop a national pesticide safety training program and conduct education and outreach to farmworkers and their families.	5 years Active (Through March 2026)	\$2,500,000

COOPERATIVE AGREEMENT TITLE	RECIPIENT	GENERAL PURPOSE	LENGTH/ACTIVE / INACTIVE (YEAR COMPLETE)	AWARD AMOUNT
Pesticide Regulatory Education Program	Originally awarded to University of California Statewide Integrated Pest Management Program and transferred to Colorado State University	Implement the Pesticide Regulatory Education Programs by developing and hosting courses in different locations around the United States for pesticide regulatory officials.	5 years Active (Through December 2025)	\$2,675,000
National Pesticide Information Center	Oregon State University	Provide access to objective, science-based information on pesticide-related subjects to the general public.	5 years Active (Through February 2024)	\$5,000,000
Engaging All Stakeholders	Michigan State University	Coordinate meetings, workshops, and conferences with partners and stakeholders involved in the implementation of the 2015 Rule and the 2017 Certified Applicator regulations.	5 years Active (Through August 2023)	\$2,499,999
Pesticide Education for Medical Professionals (PERC-Med)	University of California, Davis Extension (UCDE) and Oregon State University	Improve health outcomes for farmworker and agricultural communities by increasing knowledge and awareness of environmental and occupational health risks, with a focus on providers.	5 years Inactive (Ended March 2023)	\$125,000 in first year; up to \$500,000 per year for the next four years, subject to availability of funds
Pesticide Safety Education Funds Management Program	eXtension Foundation	Manage the distribution of funds to Pesticide Safety Education Programs (PSEPs) in State Cooperative Extension Services at Land Grant Universities. Funds will be used to provide pesticide applicator training on the safe use of restricted-use pesticides by applicators in agricultural, commercial, and residential settings.	5 years Active (FY2024–2028)	Up to \$15,000,000

COOPERATIVE AGREEMENT TITLE	RECIPIENT	GENERAL PURPOSE	LENGTH/ACTIVE / INACTIVE (YEAR COMPLETE)	AWARD AMOUNT
Pesticide Inspector Residential Training (PIRT) ⁵⁴	TBD	Provide pesticide educational training to inspectors and staff of states, tribes, and U.S. territories working under FIFRA cooperative agreements.	5 years (FY2024–2028)	Up to \$3,000,000

Agricultural Community-Based Project Grants⁵⁵

Subawards under PERC 2.0 for community-based organizations providing WPS training and pesticide education.

RECIPIENT	PROJECT PURPOSE OR TITLE	LENGTH	AWARD AMOUNT
Campeños Sin Fronteras	Outreach and training to Spanish-speaking farmworkers in Yuma County, Arizona.	2 years	\$100,000
Toxic Free North Carolina	Outreach to increase WPS awareness among farmworkers in North Carolina.	2 years	\$50,000
Farmworker Association of Florida	Education to inspire and enable the farmworker community to reduce their chronic exposure to agricultural pesticides.	1 year	\$100,000
Ag Health & Safety Alliance™ – Mississippi	Building pesticide safety education for Gear Up for Ag!™ programs and WPS-compliant respirator fit testing in Mississippi.	2 years	\$100,000
National Center for Farmworker Health – Northern Texas	Increasing pesticide safety knowledge among Indigenous farmworkers on the Texas-Mexico border through culturally and linguistically responsive approaches.	2 years	\$100,000
Surry Medical Ministries – Western North Carolina	Agricultural Virtual Outreach for Inclusion and Development (AVOID); providing education to farmworkers who have limited time for training once they have relocated to their work sites.	2 years	\$96,186

The EPA receives advice on its spending and programming related to pesticide safety—among other regulatory functions—from the **Pesticide Program Dialogue Committee** (PPDC). The PPDC is a federal advisory committee that has advised OPP since 1995.⁵⁶ The committee generally meets twice a year to provide feedback to the EPA on policy and program implementation.⁵⁷ In 2021, the PPDC organized a Farmworker and Clinician Workgroup that met regularly over the year to evaluate the EPA’s pesticide program and suggest recommendations to the agency on its worker protection activities.⁵⁸

Some members of the PPDC’s Farmworker and Clinician Workgroup have expressed concerns about the execution of these cooperative agreements.⁵⁹ Members have communicated concerns that PERC and PERC-Med appeared to produce and engage less than anticipated relative to the resources provided to both programs. They also identified a deficit in PERC-Med’s efforts in targeting clinicians to seek input and in considering feedback. Workgroup members have voiced a need for more farmworker and farmworker advocate involvement in the EPA’s decision-making concerning cooperative agreements.⁶⁰ Additionally, they have called for requirements that awardees engage more with workers by incorporating them in decision-making processes, soliciting more significant input and feedback on development of WPS resources, and increasing transparency around these engagements.⁶¹ Others have noted the challenge awardees face in developing resources for a diverse array of stakeholders (e.g., pesticide applicators; not only workers) and contexts, which also requires a broad range of expertise.⁶²

As shown in the table above, most of the funding for developing educational resources has gone to universities rather than community-based organizations directly engaged with workers. (A notable exception is the agreement with the Association of Farmworker Opportunity Programs, discussed on page 37, *infra*). Following advocacy from farmworker groups, Congress, in PRIA 5, restricted future grant funding for such educational activities to community-based nonprofit organizations.⁶³ This funding restriction may address some of the concerns that Farmworker and Clinician Workgroup members expressed and promote stronger links to farmworker communities when developing training and educational materials. Future requests for applications for these funds should call upon (and provide support for) applicants to engage with experts and stakeholders across the industry—including university partners—so that the breadth of expertise across the field can be brought to bear on the projects as community-based organizations steer the ship.

Pesticide Safety Education Programs (PSEPs) are another important avenue for educating the agricultural community. Typically based at land grant universities,⁶⁴ PSEPs provide training to pesticide applicators on the safe use of restricted pesticides, thereby enabling states to develop and administer state plans for applicator certification under the EPA’s rule on Certification of Pesticide Applicators (CPA).⁶⁵ Certified applicators are either private applicators, who “apply pesticides for the production of an agricultural commodity on land [they] or [their] employer owns or rents,” or commercial applicators, who are typically employed to apply pesticides on others’ land.⁶⁶ Because certification of private applicators requires competency in various aspects of pesticide safety—including the WPS and communicating information about pesticide exposure and risks with workers, handlers, and others⁶⁷—this training is an important way to educate growers of their obligations under the WPS.

Funding for PSEPs has waned over the years and some programs have faced challenges sustaining their operations. EPA support for state PSEPs is administered by the Pesticide Safety Education Funds Management Program through a cooperative agreement, as noted in the table above.⁶⁸ The Fund Manager administers subawards to individual state PSEP programs.⁶⁹ Recently, these subawards have averaged just \$19,000.⁷⁰ Additional funding may be acquired through competitive grants from the U.S. Department of Agriculture (USDA) or other fundraising at the state level, however, this support is relatively limited. The National Pesticide Safety Education Center (NPSEC) also provides supportive infrastructure for PSEPs to develop, market, and sell materials, with a portion of revenues going back to support state PSEPs.⁷¹

Stakeholders have identified a number of challenges with the current funding scheme for PSEPs, including inconsistent and often low funding from PRIA and EPA discretionary funds, high management and overhead costs, and lack of capacity for competitive awards or additional fundraising.⁷² These federal funding deficits have prompted some programs to raise user fees and turn to state policymakers to supplement resources (e.g., through pesticide registration fees, pesticide fines, and state general funds).⁷³ Still, some PSEPs cannot operate without the EPA funding, which can exacerbate inefficiencies and challenges for the programs in the short and long term.⁷⁴ With limited resources, many programs rely on the “Certification and Training” resources created by PERC to help them implement their state’s certification plan, particularly with the EPA’s recent revisions to the CPA regulations.⁷⁵

Recommendations

The EPA provides a significant amount of funding to support pesticide safety through the cooperative agreements described. In light of calls for increased transparency and accountability regarding the development and implementation of these agreements, the EPA should:

- Incorporate stakeholders in the development of requests for applications and more precisely specify priority activities, deliverables, and processes for applicants.
- Consider administering smaller-scale cooperative agreements so that grantees can focus attention and energy on a narrower set of activities. This shift could help address concerns that large-scale projects have been slowed by the diverse range of priorities and stakeholders they aim to serve. To ensure these projects remain cohesive, the EPA may need to play a larger coordinating role.
- Collaborate with recipient organizations to develop a public-facing work plan that is published on the EPA’s website and updated with progress reporting at regular intervals. To the extent feasible, this public reporting could include information regarding grant spending to further promote transparency.
- Encourage partnerships that bring a range of expertise to projects, ensuring that community-based organizations play a significant or lead role in steering projects that aim to benefit farmworker communities. Where grants are not provided to these organizations directly, ensure that the community-based organizations are fairly compensated for their time and contributions to the project’s goals.

Compliance Monitoring

Government WPS compliance monitoring occurs through agricultural-use inspections (also discussed on page 21, *supra*). During an inspection, the inspector will evaluate compliance with product-specific use requirements and general WPS requirements, with goals of general oversight/monitoring, addressing instances of noncompliance, documenting violations, preventing misuse and exposure incidents, and increasing handler and worker safety.⁷⁶ Most inspections are carried out by state agencies, with the EPA providing guidance through its FIFRA Compliance Monitoring Strategy⁷⁷ and FIFRA Cooperative Agreement Guidance (for state cooperative agreements with the EPA to carry out these functions).⁷⁸ State agencies are expected to target and prioritize high-risk pesticides, large numbers of workers, high-exposure scenarios, or repeat offenders.⁷⁹ When conducted on-site, monitoring activities can include observing and documenting through notes and pictures; gathering information from witnesses or establishment representatives; reviewing records; and collecting samples.⁸⁰ Currently, there is no required or recommended WPS inspection frequency for state programs; instead, it just “must be part of a balanced state inspection plan.”⁸¹ The Compliance Monitoring Strategy also encourages states to maintain a visible presence in the FIFRA-regulated community to help deter potential violators.⁸²

Interviews with workers are a critical component of a thorough inspection and effective compliance monitoring. However, while the majority of farmworkers communicate most comfortably in Spanish,⁸³ inspectors are not required to be bilingual. The EPA encourages states to hire bilingual inspectors or to use an on-site interpreter, other interpreter resources and services, or conduct follow-up phone interviews with an interpreter.⁸⁴ To help inspectors further overcome language and cultural barriers, the EPA has a manual (last updated in 2007, with an updated resource, through PERC, anticipated in 2024)⁸⁵ to guide inspectors in interviewing Spanish-speaking workers during a WPS inspection.⁸⁶ The manual highlights the challenges of obtaining candid responses and accurate information from workers when relying on an interpreter, which can hinder rapport building.⁸⁷ Lack of language skills is also a barrier when interpretation services are not available. Inspectors are required overcome language barriers to interview employee complainants during for-cause inspections.⁸⁸ In routine (neutral scheme) inspections, inspectors may have more discretion to interview only English-speaking employees or forego interviews.⁸⁹

Recommendations

Employing bilingual inspectors who can build rapport with workers and engage with them directly is necessary to effectively monitor compliance and is superior to relying on auxiliary services that may stifle the exchange or may not be available on-site during an inspection. For these reasons, policymakers should:

- Support research examining the efficacy of compliance monitoring activities conducted by bilingual and monolingual (English-speaking) inspectors.
- Support the education, training, and recruitment of bilingual inspectors and move toward making language skills a job requirement.

Compliance Support to Growers

With support from the awardees noted above, the EPA and state enforcement agencies offer various resources to equip growers to meet their compliance obligations. The EPA offers a WPS “How to Comply” Manual, developed and authored in collaboration with PERC,⁹⁰ as well as a two-page “Quick Reference Guide.”⁹¹ The EPA’s Office of Enforcement and Compliance Assurance has a National Agriculture Center that brings together guidance on laws and regulations that may apply to various agricultural operations, with more information available through regional contacts and offices.⁹² The recently redesigned PERC website also provides a library of resources, including handbooks, posters, flipcharts, presentations, and trainings, much of which is also available for purchase (hard copy) through the National Pesticide Safety Education Center (NPSEC).⁹³ State enforcement agencies typically provide additional guidance resources, particularly those with stricter regulations.⁹⁴ While compliance assistance should not substitute for enforcement, states are permitted to provide outreach materials, conduct seminars or public meetings with employers to explain requirements and answer questions, provide remedial training, and develop self-audit programs.⁹⁵ University extension, trade associations, and private entities are additional sources of guidance and resources supporting knowledge and awareness of grower WPS obligations.



Growers may also acquire direct compliance support tailored to their operation. Some larger operations employ a staff member who is responsible for ensuring the operation's compliance with its obligations to employees, including record maintenance, internal protocols, and WPS training.⁹⁶ Growers required to carry workers' compensation or that otherwise carry liability insurance may receive some compliance support from their insurer to help mitigate financial risks as well.⁹⁷ Other operations may engage private entities or attorneys to advise the operation on its compliance obligations, evaluate the operation's existing policies and practices, and assist the operation in addressing deficits or establishing new systems. Private entities, both nonprofit and for-profit, also offer compliance advising and trainings to workers and supervisors to help growers meet their WPS obligations.⁹⁸

Individualized support from public entities also occurs when university extension programs offer consultation services or when state enforcement agencies offer compliance assistance inspections. For instance, in **North Carolina**, the Field Operations Unit of the state's pesticide enforcement agency offers compliance assistance inspections, upon request, that provide growers with operation-specific guidance on how to comply with applicable pesticides laws and regulations.⁹⁹ If violations are found, farmers receive guidance on how to address the issue and a timeline for correcting the problem.¹⁰⁰ NC State Extension also has a Farmworker Health and Safety Education Program that provides additional support to both growers and workers.¹⁰¹ **Oregon**, the only state where the state's OSHA is in charge of pesticide enforcement, also offers targeted compliance assistance activities through risk-free inspections and support for employers with a higher potential for WPS violations.¹⁰² While these resources should be helpful to growers, stakeholders report that most growers do not take advantage of these offerings for fear of inviting additional regulatory oversight onto their farm.¹⁰³ To a limited extent, EPA policy allows inspectors to provide general compliance assistance during an inspection (e.g., sharing materials and information) but admonishes that "under no circumstances should the EPA inspector tell the facility that it is exempt from enforcement actions if the facility corrects or fixes potential violations observed during the inspection."¹⁰⁴

The published general guidance provided by the EPA, PERC, and states, coupled with the tailored support offered by both public and private entities, provides growers resources to ensure they are equipped with the knowledge they need to comply with the WPS on their operation. Nevertheless, not all growers make use of these resources and many fail to meet all the WPS requirements. As discussed in the Factors Shaping the Compliance Landscape section below (pages 68-87, *infra*), factors such as age, farming experience, size, and staffing can influence grower compliance.

Recommendations

To address the knowledge deficit, the EPA should:

- Engage in a national campaign, tailored to each region, to raise awareness of these obligations and their importance. The EPA could collaborate with the USDA, land grant universities, and cooperative extension to extend the campaign's reach.

A photograph of a worker in a vineyard. The worker is wearing a wide-brimmed hat, a long-sleeved jacket, and gloves, and is using pruning shears to trim a vine. The vineyard is filled with rows of grapevines under a clear blue sky. Another worker is visible in the background, also working on a vine.

DEEPER DIVE INTO WPS COMPONENTS

David Bacon

THIS SECTION TAKES A CLOSER LOOK AT THE MAJOR COMPONENTS OF THE WPS AS OUTLINED IN THE INTRODUCTION. The first two subsections focus on elements of the WPS designed to **inform** workers about pesticide safety and potential exposure through **Training** and **Access to Information**. The next two subsections focus on components designed to **protect** workers from pesticide exposure through **Entry Restrictions** and **Personal Protective Equipment**. The final subsections address components intended to **mitigate** harm to the worker when a pesticide exposure incident occurs through **Decontamination Supplies** and **Emergency Assistance**. Each section describes the requirement, its importance, and barriers to its implementation and identifies recommendations to improve compliance with the standard or the standard itself.

A common thread from the concerns and critiques discussed in this section is that no evaluation of the WPS and its efficacy in safeguarding farmworkers and their communities has ever occurred. While compliance remains an issue, the bigger question of whether the WPS would effectively protect workers if universal compliance were achieved is unresolved. Anecdotal accounts from practitioners and worker advocates, considered with research on various, limited aspects of the rule by scholars across the country indicate that it would not. This report encourages assessment of each WPS component and of the rule as a whole to help determine which aspects are most effective and where improvements are needed. By testing, evaluating, and improving the rule in this manner, the EPA can promote compliance by tailoring the rule to what works and improving upon the deficits—growers can then deploy resources more efficiently to support proven safeguards, and workers will have a safer workplace.

Training for Employees

Studies have shown that worker safety training and education can positively affect workers' protective practices.¹⁰⁵ The EPA introduced safety training to the WPS in its 1992 rule revision—effective in 1995—and retained the requirement in the 2015 Rule with some enhancements. This section provides an overview of the training requirements and EPA support for developing training materials; identifies shortcomings with the predominant training method of training by video and some compelling alternatives; describes additional shortcomings with the rule and its implementation; and then turns to recommendations for improvement.



Despite the robust attention devoted to training here, training by itself is insufficient to protect workers. Research has shown that in many cases, workers recognize the dangers associated with pesticide exposure but lack the ability to protect themselves from exposure.¹⁰⁶ Therefore, this report cautions against overemphasizing the role of training uncoupled from additional safeguards to eliminate or mitigate potential exposure.



Worker Stories: Yesica¹⁰⁷

Yesica was employed in a nursery where she was to handle and mix pesticides. She learned about the risks of pesticides from her membership in the Farmworker Association of Florida and attendance at one of FWF's WPS trainings. Yesica was pregnant at the time and was concerned about her health and the health of the fetus/her baby. She was not provided with PPE to protect herself. To improvise, she would cover her face with her T-shirt, holding a corner of it over her nose and mouth in an attempt to protect herself. Months later, her baby was born with craniosynostosis, in addition to other health problems, including skin problems that continue to this day. She cannot help but wonder and even feel guilty about whether the baby's health problems were related to the exposures she experienced.

The Worker Stories in this report were shared with the authors by the Farmworker Association of Florida (FWAF) and adapted with permission for length. The authors are incredibly grateful to the individuals who were brave enough to share their experiences and to FWAF for its commitment to serving and advocating on behalf of farmworkers.

Requirements Overview

Under the 2015 Rule, employers must ensure that all workers and handlers receive EPA-approved pesticide safety training on an annual basis. This marks a departure from the prior rule, which required training every five years.¹⁰⁸ The rule requires training to be completed before any relevant work begins, another change from the previous five-day grace period. For agricultural workers, training must occur (or have occurred within the last 12 months) before they perform any task in an area where a pesticide has been used or a “restricted entry interval” (REI, discussed further on page 52, the time period following the application of a pesticide during which an agricultural employer must keep workers out of the treated area) has been in effect within the last 30 days.¹⁰⁹ For handlers, the requirement must be met before they perform any handler activity involving a pesticide product.¹¹⁰

The training itself must meet certain parameters.¹¹¹ The rule requires the training be:

- Administered orally or via audio-visual format (i.e., a recorded video) and in a manner that workers can understand, such as through use of an interpreter.
- Provided at a location “reasonably free from distraction and conducive to training.”
- Conducted by someone who either is a designated trainer by the EPA or the agency responsible for pesticide enforcement, has completed an EPA-approved pesticide safety train-the-trainer program, or is a certified applicator. This person must be present during the entire training program and respond to trainee questions.

Employers must maintain records of the training and attendance for two years and make those records available to a worker upon request.¹¹²

The 2015 Rule updated and expanded the required WPS training topics but delayed implementation until 2018 and only after the EPA made available public training materials that conform to the revised requirements.¹¹³ The EPA published its notice of availability for these materials on June 22, 2018, triggering the compliance requirement 180 days thereafter.¹¹⁴ The expanded training requirements for workers cover 23 different topics that include the responsibilities of employers and workers in pesticide safety, hazard recognition and mitigation, first aid and decontamination procedures, best practices for personal protection from exposure, and hazards related to bringing pesticides home and those pertinent to children, pregnant women, and nonworking family members.¹¹⁵ For handlers, the training must include 13 additional topics, including safe application practices and employer WPS responsibilities specific to handlers.¹¹⁶

All training materials must be EPA-approved to comply with the WPS training. The Pesticide Educational Resources Collaborative (PERC) developed some materials and published, in 2018, the initial training materials publicly available under the rule through its cooperative agreement with the EPA, described above.¹¹⁷ PERC hosts these training materials and other EPA-approved, publicly available training materials on its website.¹¹⁸ Many of these are available for purchase on the NPSEC website.¹¹⁹ Other publicly available trainings on the PERC website include

bilingual flipchart trainings with images and scripts (developed by the Association of Farmworker Opportunity Programs), PowerPoint presentations, and various video trainings developed by state agencies, universities, and PERC.¹²⁰ In addition to AFOP's trainings (described further below), other grassroots farmworkers organizations offer WPS compliant training, typically without a fee.

The qualifications of the individuals leading the training can vary. Under the rule, someone who has completed an EPA-approved train-the-trainer program can train workers. PERC offers a self-paced, eLearning course that satisfies this requirement once completed. The two- to three-hour course costs \$35 and provides users with a certificate of completion after achieving a 70 percent or higher on the final exam.¹²¹ The website also hosts a 166-slide PowerPoint presentation and accompanying manual that constitutes a qualifying course when delivered in its entirety and in the manner designed and approved by the EPA.¹²² Once a trainer meets this requirement, there is no WPS requirement to retrain, refresh, or recertify one's understanding of the content.¹²³ Training may also be provided by a certified pesticide applicator—who must recertify every two to five years, depending on the certifying agency—or by an individual otherwise designated by the EPA, state, or tribal agency as a trainer.¹²⁴ Certified pesticide applicators, while required to deliver training in accordance with the WPS requirements, are not required to receive instruction in training techniques as part of their certification.¹²⁵

Compliance Deficits

Unfortunately, there are shortcomings with current training standards. Deficits discussed in this section include the findings that:

- Most WPS training happens through video, with limited efficacy.
- More engaged trainings are available but do not reach the majority of workers.
- Current standards fail to ensure either retention or understanding of safety information conveyed.
- Some workers are not receiving training at all.

Ineffective Video Training

Current WPS training requirements afford flexibility to employers and largely fail to address the quality of worker training. Anecdotal evidence indicates that most workers receive nominal training through video.¹²⁶ Videos can be relatively short; a survey of the EPA-approved training videos available on the PERC website shows that videos typically last for 18–25 minutes for workers and 20–60 minutes for handlers.¹²⁷ Grower reliance on videos is understandable; it is relatively easy for a grower to show a video on a worker's first day and integrate WPS training into a longer orientation. It is also cheaper than paying for trainers when free training services are unavailable, inconvenient, or otherwise disruptive of regular operations.

Despite the efficiency, the efficacy of this method is questionable. First, research has shown—including in the WPS context—that while video training may improve short-term knowledge, it does not lead to longer-term knowledge retention or the desired behavioral change, especially when compared with culturally and contextually tailored curricula delivered by a trained facilitator.¹²⁸

Second, while the WPS requires that the training be delivered in a manner that workers can understand, in an environment free from distractions, and with a trainer present to answer questions, the video setting discourages the type of active engagement that could verify understanding, address questions as they arise, and keep workers attentive to the content. This kind of active engagement, or “dialogue,” “is posited to enhance the quality of reflection with respect to actions taken,” which “is regarded as the key to knowledge acquisition and transfer of training.”¹²⁹

Third, while videos in Spanish give trainers the ability to offer the WPS training in a language many workers understand better than English, the WPS requirement will not be met if the trainer present is not equipped to answer questions or clarify materials. Additionally, many workers best communicate in an Indigenous language, with only a minimal or conversational understanding of Spanish.¹³⁰ Research has shown that even among Indigenous workers who identified Spanish as a second language, significantly fewer indicated concern with the effect of pesticides on their health, or that they had worked in a treated area, compared with similarly situated Latino/a workers for whom Spanish was a first language, indicating that training and information may not be linguistically suitable for those workers.¹³¹

Finally, video trainings are often administered by the employer or a farm manager. The power dynamics in such situations can further discourage questions or engagement, particularly if workers sense their boss is dismissive of the content, in a rush, or otherwise does not perceive the workers to be at risk or pesticide safety practices to be a serious concern.

Engaged Trainings Available but Limited

Some workers receive more effective WPS training. With the PRIA funding described above (page 25), the EPA’s OPP maintains a five-year cooperative agreement with an organization to offer the National Farmworker Training Program (NFTP) on pesticide safety.¹³² The OPP awarded this \$2.5 million grant to the Association of Farmworker Opportunity Programs (AFOP) in 2020.¹³³ AFOP’s member organizations offer NFTP in 34 states and AFOP’s materials are available online on the AFOP and PERC websites to download for free, with physical materials available for purchase from the NPSEC.¹³⁴ In addition to WPS training, AFOP/NFTP offers additional EPA-funded trainings on Pesticide Safety-Take-Home Exposure Prevention (Limiting Exposure Around Families or LEAF), Pesticide Exposure and Pregnancy (PEP), and Jose Learns About Pesticides (for children), as well as other safety trainings like heat stress prevention; in total, these trainings reach approximately 30,000–37,000 individuals each year.¹³⁵

For the WPS, AFOP’s training methodology employs a flip-chart with scripts to facilitate a multilingual, interactive training.¹³⁶ The materials were developed with the assistance of farmworker focus groups, input from community-based organizations, and follow-up knowledge retention testing to ensure its efficacy.

Other groups have seen engaged, interactive training deployed successfully. Trainings facilitated by *promotores*—community health or outreach workers—have documented favorable results,¹³⁷ as have the interactive trainings led by the Farmworker Association of Florida, which utilizes a popular education model that builds on workers’ existing knowledge and experience and incorporates activities, posters, props, and games.¹³⁸ PERC’s manual for WPS trainers affirms the superiority of interactive training styles and provides guidance on integrating engaging content and activities into training.¹³⁹

These more engaged training styles yield positive outcomes. For example, research has found that workers who participate in facilitator-led training had greater knowledge retention than those who receive the standard video training.¹⁴⁰ In general, the literature on health and safety trainings finds that passive training methods (e.g., videos, lectures) are inferior to more engaging methods that incorporate things like behavioral modeling, practice, and dialogue.¹⁴¹ One meta-analysis found that these engaging methods of safety training are, on average, three times more effective than passive learning methods in promoting knowledge and skill acquisition.¹⁴² These trainings are often grounded in theoretical frameworks for how people learn and retain information, drawing from educational best practices.

While AFOP and other nonprofit and grassroots organizations and university affiliates offer this kind of training, it is not required of employers under the WPS. In addition to inadequate requirements regarding the format, there are no requirements regarding the quality of these trainings, meaning there is wide variation. Although AFOP trainings are available in many states, some employers may not be seeking out these services because they believe they can cover the material (and more quickly) with someone in-house or because they lack an established relationship with a training provider, and therefore may not trust external groups to provide training or may not appreciate the value.¹⁴³ The EPA or its grantees should work to develop best practices in partnership with farmworkers and grassroots organizations to improve industry and regulatory standards in the future. Incentives that encourage employers to meet this requirement by allowing nonprofit and grassroots organizations to provide training, and allocate sufficient time to conduct the training, could ensure that enhanced trainings are delivered by groups that prioritize worker health and safety. The EPA should also be assessing training modules to see which formats are the most effective in promoting retention and understanding.

Challenges with Retention and Understanding

Other deficits in the standard—beyond the failure to employ engaging and theoretically grounded training methodologies—limit the training requirement’s effectiveness. While annual training is a major improvement over the previously required training that occurred every five years, workers still lose knowledge at a faster rate than they are trained. One study found that farmworkers who received EPA-approved video training did not retain their acquired knowledge after three months,¹⁴⁴ while another found knowledge loss (nearly back to pre-training levels) following a computer-based training at the five-month mark.¹⁴⁵ Additionally, researchers have observed that some protective practices included in the WPS-required training are not followed, suggesting that one-off trainings without reinforcement do not always produce the desired behavior change.¹⁴⁶ Practitioners identify tailgate meetings (meetings around the bed of a work truck that take place during the work day) to review aspects of the WPS training at various points over the season—especially as it becomes immediately relevant—as a best practice.¹⁴⁷ Despite its utility and effectiveness, this follow up is not required by the WPS.

Additionally, there is no requirement to verify understanding of the WPS material with workers following their training. Language barriers and a lack of meaningful opportunity to ask follow-up questions (a gap reported by workers despite the rule’s requirement) can limit understanding and retention. While standardized, written tests to evaluate worker comprehension may not be appropriate, some verification measures could be useful in reinforcing material. Currently, the NFTP led by AFOP does report to EPA on the “[p]ercentage of content knowledge learned by farmworkers/trainees upon completion of EPA-supported WPS pesticide training.”¹⁴⁸ This knowledge is tested through pre- and post-training knowledge assessment, provided in a written format with questions delivered verbally and additional assistance for those who have challenges with reading.¹⁴⁹ Despite a positive result of 96 percent on this performance target for fiscal year 2022, the number of farmworkers receiving this training amounted to just 12,716 (of the estimated 2.4 million farmworkers in the United States).¹⁵⁰ And, as described above, these AFOP-developed trainings far exceed the standard trainings in terms of engagement. At a minimum, all EPA-approved training materials should be workshopped with farmworkers and developed through an iterative process to ensure that every training module has proven effective at increasing long-term worker knowledge and skill acquisition.

Finally, current compliance monitoring may not adequately document the training provided. The EPA’s WPS Inspection Checklist focuses on whether the employer has training records that show that current workers were trained in the past 12 months and whether records have been retained for two years.¹⁵¹ The design of the form prompts the inspector to glean this information through a records review (rather than by interview, which is prompted in other areas of the form). The checklist does not inquire as to how the information was delivered, if it was delivered in a manner that workers understood, and if there was an opportunity to ask questions, as required under the rule. While inspectors may still ask about these factors during a worker interview, it is not prioritized or standard on the EPA’s inspection checklist and thus may not receive the same degree of scrutiny.

Workers Not Being Trained

Finally, there remains a concern that many workers do not receive the WPS training at all.¹⁵² Only 68 percent of farmworkers responding to the most recent NAWS reported receiving training in the past 12 months (and that figure may overestimate training, for reasons noted on page 23, *supra*).¹⁵³ Stakeholders also noted that workers on small farms may not be receiving the appropriate training and resources under the WPS because their employers may mistakenly believe they are exempt from the WPS requirements (as small farms, they are exempt from federal OSHA enforcement of OSHA regulations).¹⁵⁴ Although most of the published research on pesticide training rates pre-date implementation of the 2015 Rule requirement of annual training, this prior research also demonstrated a severe deficit in training, with workers in various sample sizes reporting training at rates ranging from 21 percent to 46 percent.¹⁵⁵

Recommendations

The concerns and deficits discussed above have been voiced by many members of the farmworker and farmworker support community. In particular, the Farmworker and Clinician Training Workgroup of the Pesticide Program Dialogue Committee has provided recommendations to the OPP regarding improvements to EPA-supported WPS training and the WPS training requirements that this report endorses and expands upon:¹⁵⁶

- “Involve farmworkers, farmworker organizations, and WPS trainers in EPA-funded projects that design, develop, review and evaluate WPS training materials.” While some nonprofit organizations have developed materials in close partnership with farmworker communities and other experts (e.g., AFOP/NFTP), this has not been a requirement or prevailing practice for EPA-approved materials. To make sure training materials are effective for their intended audience—and thereby improve adherence to the WPS and best safety practices—the EPA should require farmworker participation (and compensation) in the development of materials funded by the EPA and work toward requiring such involvement as a prerequisite for EPA approval. Experienced trainers should also be involved in developing and testing these materials. Where materials have already been developed, this engagement could focus on updates, improvements, and filling gaps.
- “Incorporate evidence-based approaches to design and evaluate effective training.” Rather than simply providing the information listed in the WPS, training should be designed to achieve the pedagogical goals of instilling lasting behavior change and retaining information long term. Modules should be designed with a foundation in demonstrated best educational practices, tested for efficacy, and evaluated before implementation and at regular intervals thereafter. For instance, experiential learning programs—rooted in hands-on experiences and reflection—that are well-planned, supervised, and carefully selected for their learning potential can empower learners to more actively engage with their educational experience and lead to improvements in analysis, critical thinking, and synthesis.¹⁵⁷ Popular education models have also proved successful in farmworker training. Worker understanding could be verified through practical format, such as a demonstration test.

- “[Encourage or r]equire that farmworker training be provided in an appropriate and engaging format and that it be culturally and geographically relevant.” Research has demonstrated that culturally and contextually tailored training delivered by a facilitator improves knowledge gain and retention among farmworkers receiving pesticide safety training.¹⁵⁸ Ensuring that peer trainers, or promotores, who share similar cultural backgrounds with farmworkers can improve the existing standardized curriculum and provide needed support for workers who may be unsure who to ask for help following the completion of their training program.¹⁵⁹ While delivery in a language workers understand is already a requirement, the EPA should continue to emphasize the importance of such language access in training and materials, including in follow-up discussion and questions when an employer relies on a video training.
- “Encourage or require refresher training for non-[certified] trainers.” Currently WPS trainers who are not certified applicators have no obligation to refresh themselves on materials—or become acquainted with evolving best practices for training administration—after completing a train-the-trainer program. To ensure they maintain their knowledge, learn about current EPA guidance or WPS changes, can address worker questions, and are up-to-speed on training best practices, trainers should be required to complete a refresher course at regular intervals.
- Encourage or require certified applicators to be educated in effective training methodologies.
- Encourage or require that workers receive refresher trainings (i.e., tail-gate trainings) on pesticide safety regularly, such as quarterly, at specified intervals during the season, and/or following a triggering event. While this is a best practice that many farms currently implement, it is not required under the current WPS. These more frequent trainings should be tailored to present circumstances, which could better support workers who change work environments or job responsibilities over time.
- Develop best practices in partnership with farmworkers and grassroots organizations to improve upon industry and regulatory standards in the future. The EPA should also assess training modules to see which formats are the most effective in promoting retention and understanding.
- Consider incentives that encourage employers to meet their obligations by allowing nonprofit and grassroots organizations to provide training, and allocate sufficient, dedicated paid work time to conduct the training.

While improvements to WPS trainings should be incorporated into the WPS training requirements—e.g., require that trainings incorporate experiential learning, are culturally relevant, etc.—it may be challenging to require growers to provide such high-quality trainings on the first day of work. Growers and farm managers may not be suited to provide such training themselves. Third-party providers may also not have the capacity to meet the increased demand, particularly at low or no cost to growers. For instance, the EPA-supported AFOP trainings noted above currently reach just 12,716 workers of 2–3 million workers in the country. Recognizing this capacity challenge, the EPA could consider keeping the current requirement, with some enhancements (e.g., requiring some interactive component) for trainings provided in a worker’s orientation and require that workers receive a more substantial pesticide safety training within a specified timeframe.

Access to Information

Engaging in protective behaviors requires that workers are informed about the pesticides they may be exposed to in the workplace. Protective behaviors can include washing hands before eating, using the restroom, or other activities; bathing and changing into clean clothes immediately upon arriving home after work; not wearing work shoes or other gear in the home; washing work clothes separately from other clothing; and wearing long-sleeves, long pants, shoes, and socks at work. These behaviors can help protect workers and their families but depend upon workers’ comprehension of potential exposures at work. To this end, the WPS requires employers to: (1) display and maintain basic pesticide safety information; and (2) display and record pesticide application and hazard information.¹⁶⁰

Requirements Overview

Employers must display general pesticide safety information in an accessible manner in the same place they post pesticide application information and provide decontamination supplies.¹⁶¹ Starting in 2018, the WPS requires employers to include 10 items (modified and up from nine items previously) in the pesticide information.¹⁶² The rule does not require a specific display format,¹⁶³ but PERC has posters—in nine different languages—that meet the requirements available to growers online and for purchase through NPSEC.¹⁶⁴

REQUIRED PESTICIDE SAFETY INFORMATION

- Avoid getting on the skin or into the body any pesticides that may be on or in plants, soil, irrigation water, tractors, and other equipment, on used personal protective equipment, or drifting from nearby applications.
- Wash before eating, drinking, using chewing gum or tobacco, or using the toilet.
- Wear work clothing that protects the body from pesticide residues (long-sleeved shirts, long pants, shoes and socks, and a hat or scarf).
- Wash or shower with soap and water, shampoo hair, and put on clean clothes after work.
- Wash work clothes separately from other clothes before wearing them again.
- If pesticides are spilled or sprayed on the body use decontamination supplies to wash immediately, or rinse off in the nearest clean water, including springs, streams, lakes or other sources if more readily available than decontamination supplies, and as soon as possible, wash or shower with soap and water, shampoo hair, and change into clean clothes.
- Follow directions about keeping out of treated areas and application exclusion zones.
- Instructions to employees to seek medical attention as soon as possible if they believe they have been poisoned, injured or made ill by pesticides.
- The name, address, and telephone number of a nearby operating medical care facility capable of providing emergency medical treatment. This information must be clearly identified as emergency medical contact information on the display.
- The name, address and telephone number of the State or Tribal pesticide regulatory agency.

Display of Pesticide Safety Information, 40 C.F.R. § 170.311(a)(3)

In addition to safety information, employers must record and display pesticide application information. This information must:¹⁶⁵

- Identify the pesticide’s EPA registration number and active ingredients, the type of crop treated, the location that the applicator treated, a description of the treated area, the start and end time of the application, and the Restricted Entry Interval (REI) duration from the pesticide’s label.
- Be displayed in a central location accessible to workers (“central display”).
- Be posted, along with Safety Data Sheets (SDSs; printed material with details about the physical and chemical properties of a product) within 24 hours of a pesticide application and before workers enter the area.
- Remain available in the same location for 30 days after the REI expires.
- Be maintained for two years after the REI’s expiration.
- Be made available to workers, designated representatives, and medical personnel upon request.

The EPA also suggested that employers display the information about the treated area in an understandable format that distinguishes the treated area from other locations at the site, such as a map, diagram, or other pictorial format.¹⁶⁶ Additionally, it suggested the use of texting to share information about pesticides and applications.¹⁶⁷ These suggestions are not required under the WPS and do not appear in EPA/PERC’s “How to Comply Manual,” however. The language requirement for conveying pesticide safety information does not currently extend to the pesticide application information.

Compliance Deficits

Inadequate or complete lack of central posting of safety information has been one of the most frequently cited violations reported to the EPA in recent years, despite the rule’s content remaining relatively constant since 1992.¹⁶⁸ Stakeholders suggested this overrepresentation is because violations are easy to ascertain; the display is static and its absence is apparent.¹⁶⁹ The noted deficiencies may be due to employer oversight or neglect in keeping information up to date. Larger operations seem to have trouble with complying, especially when schedules change.¹⁷⁰ Weather can also impact compliance with the central display component if the grower chooses to post the information outside without shelter.¹⁷¹

Certain factors can also diminish workers' comprehension of information and the requirement's efficacy. Language barriers can pose a challenge, as can an employer's tendency not to take down outdated information, thereby undermining trust in the information displayed.¹⁷² Additionally, if the central display is not in a place where workers regularly congregate, workers will not readily see it. Many workers perform pre-harvest and harvest-related tasks in which they are unlikely to be near a "centralized location" at all, let alone throughout the day.¹⁷³ In one study in **North Carolina**, less than half of the workers interviewed reported that their employers post pesticide information in a location workers access.¹⁷⁴



Bilingual Pesticide Labels

PRIA 5 requires that end-use pesticide product labels provide a Spanish translation of certain health and safety information, with implementation for restricted use pesticides beginning in December 2025.¹⁷⁵ These translations must be available either directly on the pesticide product container or through a link to such translation via scannable technology or other electronic methods readily accessible on the product label (e.g., QR codes).¹⁷⁶ The EPA recently (June – August 2023) solicited input to ensure these bilingual labels are accessible to farmworkers.¹⁷⁷ Making pesticide label information available to workers in Spanish is an important first step in improving language access for critical health and safety information. However, policymakers should go further.

PRIA 5 and the EPA's implementation of the mandate limit the Spanish-translation requirement to health and safety information on the label. For workers and handlers to have full access to critical information that is relevant to their work and health, all information on a pesticide product label should be available in Spanish (and in other languages as well). In particular, translation of the pesticide's directions for use would make instructions accessible to handlers proficient in reading Spanish but not English. It could also provide workers an opportunity to review the directions and become more familiar with the pesticides being applied where they work. Electronic versions of the label could include multiple languages as well as an audio option to make the information accessible for those who face challenges with reading text.

Additionally, to integrate the new Spanish translation requirement with the WPS and make the information accessible, the EPA should require growers to post the bilingual pesticide information and/or QR code along with the application information in a central location and various worksite locations where workers are present.¹⁷⁸



Worker Stories: Ubalda¹⁷⁹

In June 2020, Ubalda came to the Apopka office of the Farmworker Association of Florida (FWAF) with complaints about symptoms she said were related to exposure to workplace pesticides. Ubalda has taken the FWAF pesticide health and safety training several times, so she knew and understood the risks of pesticide exposure, the importance of taking protective measures. She is also a cancer survivor, and she was hoping to get out of agriculture after her cancer treatments ended, but she uses spoken, not written, language and speaks very little English. She is also undocumented, so her options are very limited. She began work at a local agricultural plant tissue culture laboratory where she did various jobs. She was concerned about the pesticides and other chemicals being used. After being exposed to drift and residue on several occasions, she developed symptoms, which is when she went to the FWAF office to share her experiences. FWAF staff asked her if she knew what pesticides were being used in the area where she was working. She did not. A week or so later, she went to the office again. She had taken a photo of the pesticide label with her cellphone camera. Because they were able to read the name of the pesticide on the label, FWAF staff looked it up on the internet. Strikingly, her symptoms were consistent with the symptoms mentioned on the label. If they had not seen the label, they would never have known this. Ubalda could not read the label—it was in English, and she does not read either in English or in Spanish. But, because she took a photo of the label, FWAF was able to look it up and learn about the pesticide, including symptoms and safety precautions.

Having the pesticide label in Spanish, in this case, may not have prevented Ubalda's pesticide exposure. But it would have given her access to information she needed to protect herself and others. She warned her co-workers about the pesticide, but they were assured by their supervisor that the pesticide was completely safe. However, if the pesticide label had been in Spanish, Ubalda could have taken a photo of it and shown the Spanish version of the label to her co-workers so that they would know the signs, symptoms and necessary precautions and protections. In addition, if the label had also contained pictographs, Ubalda and her co-workers would have been able to understand warnings that they should be aware of and take into consideration and steps they should take to protect themselves.

Recommendations

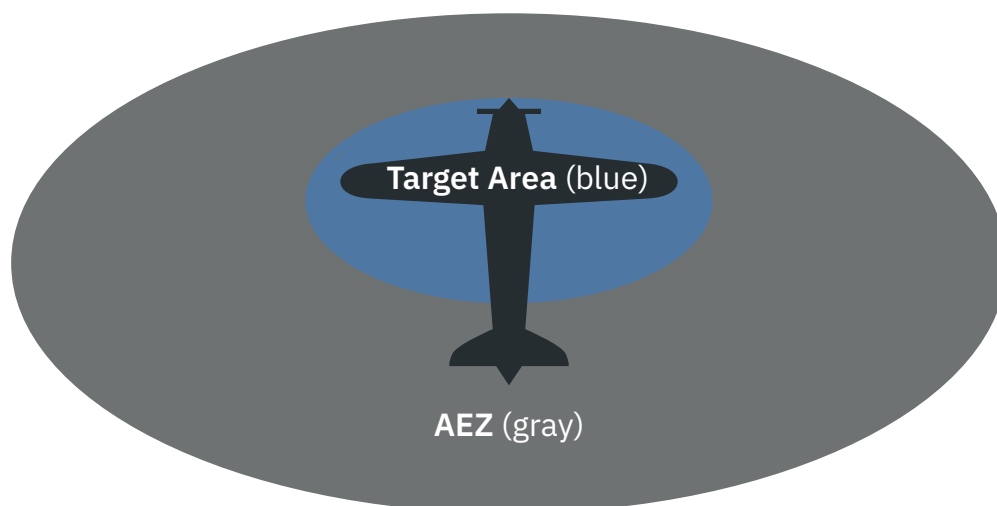
To bolster compliance with the access to information provisions of the WPS, policymakers should:

- Encourage or require that the central display information include picture format of the application area, such as a map of applications with landmarks and illustrations of safety guidelines that are more accessible to a diverse workforce. The PPDC Farmworker and Clinician Training Workgroup recommended that training use more pictures to accommodate workers' literacy levels.¹⁸⁰ Applying a similar approach to sharing safety information with workers would also likely improve accessibility and retention.
- Conduct surveys or focus groups with farmworkers to gather input on the most effective way to communicate safety information and collaborate with community-based organizations to ensure accessibility and cultural relevancy of safety materials. This review, evaluation, and revision process should be an ongoing endeavor to ensure that communication continuously improves.
- Encourage or require pesticide safety information to be posted at additional locations, such as water stations, bathrooms, worker transportation, and worker housing.
- Encourage or require pesticide application information to be conveyed in the languages understood by workers at that operation.
- Provide safety and application information in several languages in pocket-sized cards and a mobile-friendly format so workers with mobile access can carry it with them. Making it possible for farmworkers to carry the information with them as they move through the operation improves the chances that the safety information will be available and helpful when needed. Electronic methods may also be updated more easily, promoting communication of the most accurate, up-to-date information. Workers would also be able to look at the information when not at work with help from friends or family members with higher literacy levels.
- With provision of information electronically, encourage or require growers to permit use of mobile phones for information retrieval at the worksite and allow worker use of grower Wi-Fi networks where available to enable access.
- Expand the PRIA 5 bilingual pesticide labeling requirement to include directions for use.
- Expand the PRIA 5 bilingual pesticide labeling requirement to include languages in addition to Spanish. Farmworkers speak a diverse array of languages, and expanding the label languages to accommodate as many farmworkers as possible will promote worker health and safety.¹⁸¹
- Encourage or require growers to post the bilingual pesticide information and/or QR code along with the application information in a central location and various worksite locations where workers are present.
- Encourage or require that the central display information reminds the worker that they have access to the record for two years and provides information on how to request it.

Entry Restrictions

While handlers engage with pesticides in the most direct or overt way, workers entering treated areas also face great risk of exposure through both skin absorption and inhalation of pesticide residues, as well as a minor risk of ingestion. Requiring workers and other persons present on agricultural establishments to maintain a certain distance from pesticide application sites—both during and after applications—serves as an essential control to reduce exposure to harmful pesticides.¹⁸² The WPS includes two such requirements: the AEZ and the REI. The AEZ, enacted as a part of the 2015 Rule, applies during a pesticide application, whereas the REI becomes applicable after a pesticide application.¹⁸³

Application Exclusion Zone



Requirements Overview

The AEZ is a no-entry area measured as a horizontal straight line from the point of application outwards and can be conceptualized as a two-dimensional circle that surrounds each point of application (e.g., each nozzle) in all directions and moves with the equipment.¹⁸⁴ The AEZ represents the area(s) within which no worker or other person may enter or remain during the pesticide application, apart from appropriately trained and equipped pesticide handlers conducting the applications.¹⁸⁵ The AEZ builds upon the established “Do Not Contact” provision that has long required handlers to ensure that no pesticide is applied in a manner that may contact, either directly or through drift, any agricultural worker or other person other than handlers involved in the application.

AEZ distances are based on application type. For applications by aircraft or air blast (ground applications with a fan in the sprayer), or as a spray using a spray quality of “smaller than

medium”¹⁸⁶ or as a fumigant, smoke, mist, or fog—all of which are methods in which a pesticide is expected to move a farther distance from where it is applied—the AEZ is 100 feet in all directions.¹⁸⁷ For applications by spray from more than 12 inches off the ground that are not covered by any of the aforementioned methods—for which the pesticide is expected to move a shorter distance from the point of application—the AEZ is 25 feet in all directions.¹⁸⁸ For application types other than those specifically covered, no AEZ is required.¹⁸⁹ During applications in enclosed spaces, such as greenhouses, the agricultural employer is responsible for ensuring that no worker or other person, other than the handler involved in the application, enters or remains in the specified area(s) during the application.¹⁹⁰



One state has promulgated stricter AEZ rules than the federal WPS.¹⁹¹ In **Oregon**, a 150-foot zone applies when the pesticide label requires the handler to use a respirator and the pesticide is applied either by air blast sprayer, by aircraft, or when the quality of the spray is fine or very fine. Additionally, the Oregon AEZ remains in effect until 15 minutes after the application equipment passes, which is not a requirement of the federal standard.¹⁹² This heightened caution is due to the prevalence of farmworker housing in the middle of orchards in Oregon and may be due also in part to Oregon OSHA’s authority over WPS enforcement, making workplace health and safety the primary objective behind the standard.

Agricultural employers are required to keep all persons out of the AEZ during any pesticide application occurring within the boundaries of their establishment, including buildings.¹⁹³ In promulgating the AEZ in 2015, the EPA noted that difficulties could arise if an agricultural

employer were required to control what happens beyond the boundaries of the agricultural establishment. Consequently, the agency opted to limit the portion of the rule requiring employers to keep workers and other persons out of the AEZ to areas within the agricultural establishment.¹⁹⁴ However, handlers—those operating the pesticide application equipment—must ensure that no one is inside any part of the AEZ and must suspend the application if anyone enters the AEZ, regardless of whether the person is on the agricultural establishment.¹⁹⁵



Back and Forth Over the AEZ

As noted previously, the EPA attempted to roll back several of the AEZ requirements in an October 2020 Final Rule. However, a coalition of farmworker advocacy organizations and state attorneys general succeeded in obtaining a stay of the rule’s effective date from the U.S. District Court for the Southern District of New York.¹⁹⁶ Thus, most of the AEZ requirements promulgated in the 2015 Rule remain in effect and the stayed 2020 changes have not been implemented.¹⁹⁷ In February 2023, EPA issued a notice of proposed rulemaking (NPRM) to reconsider the 2020 AEZ revisions.¹⁹⁸ According to the EPA, it undertook a review and “determined that the provisions in the 2020 AEZ Rule that weakened protections for workers and nearby communities from pesticide exposure should be rescinded to protect the health of farmworkers, their families, and nearby communities.”¹⁹⁹ The proposed rule would definitively reinstate the AEZ provisions enacted in 2015 with some relatively minor modifications.²⁰⁰

Compliance Deficits

According to a 2015 study commissioned by NIOSH, pesticide drift is the number one cause of pesticide poisoning.²⁰¹ Although the 2015 WPS Rule “takes drift seriously,” the AEZ requirements still leave agricultural workers at risk of harmful pesticide exposure.²⁰²

For instance, the Northwest Center for Alternatives to Pesticides commented that the revision “does not adequately consider the risk of pesticide drift onto and inside worker housing.”²⁰³ This risk of exposure to harmful chemicals is further exacerbated by substandard housing facilities for workers, which are frequently located near agricultural fields and often fail to meet safety and health standards for ventilation, heating, and electrical systems.²⁰⁴

Additionally, the AEZ of 100 feet is likely insufficient to protect against drift exposure, which warrants further study. For instance, in enacting the 150-foot AEZ in **Oregon**, Oregon’s OSHA noted research from the Pacific Northwest Agricultural Safety and Health Center (PNASH) at the University of Washington that found “spray drift still occurred at least 170 feet” from a sprayed

orchard.²⁰⁵ In **California**, workers have experienced pesticide exposures with spray drift of 198 feet and even up to a quarter mile.²⁰⁶ While there is a degree of scientific uncertainty regarding the most optimal AEZ radius, a precautionary and more protective approach counsels adopting more robust protection given the health risks involved.

Barriers to implementing the AEZ include the challenge of determining the AEZ on site and monitoring compliance. In response to the EPA's proposal to reinstate the 2015 AEZ requirements—which have been in full effect since 2018—state officials charged with enforcing the AEZ voiced concern over the feasibility of properly identifying and documenting violations under the rule.²⁰⁷ Largely, this stems from the difficulty of accurately measuring the distance between moving pesticide application equipment and persons in the area, whether or not those persons are located within the boundaries of the agricultural establishment.²⁰⁸ Stakeholders interviewed for this report expressed similar concerns, stating that the only way to reliably monitor compliance with the AEZ is through an on-site inspector while the AEZ is in effect, or if a complaint were submitted alleging a violation of the AEZ requirements.²⁰⁹ State regulatory officials also expressed concern over the complexity of the proposed rule and agricultural employers' ability to understand their responsibilities in complying with the AEZ requirements.²¹⁰ Some of these concerns may have been due to the EPA's lack of adequate support (“time, tools, [and] resources”) to state agencies to implement the revised WPS in 2017.²¹¹ Outreach and education will play an important role in ensuring that state enforcement officials can best support growers with AEZ compliance.

Recommendations

To strengthen the protective impact of the AEZ provisions, policymakers should:

- In the near term, finalize the 2023 AEZ proposed rule, putting to rest any lingering confusion regarding the applicability of the 2015 Rule's provisions.²¹²
- Longer term, increase the AEZ radius and lengthen its application window as a precautionary and more protective approach.²¹³
- Ensure that farmworkers' housing facilities provide adequate protection against pesticide drift infiltration.²¹⁴ This might be achieved through bolstering housing requirements, such as by amending the OSHA standards governing temporary labor camps and/or imposing requirements for worker housing built with USDA loans or grants.²¹⁵
- Establish buffer zones around farmworker housing where pesticides may not be sprayed.²¹⁶ Require employers to provide alternative housing or accommodations if a buffer zone cannot be maintained.²¹⁷
- Encourage or require advance notification of farmworker housing residents so that workers can take precautions (e.g., move toys and other items that can be moved indoors, close windows) and/or leave temporarily.²¹⁸ Application warnings should be posted in worker housing in Spanish and other languages spoken by workers.
- Encourage or require posting of warning signs along the path of the AEZ that extends into public thoroughways beyond the establishment.²¹⁹

Restricted-Entry Interval

Requirements Overview

Pesticide product labeling requires a REI during which no workers can enter or remain in a treated area. The REI is a time period following the application of any pesticide to an area of outdoor production, during which an agricultural employer must keep workers out of the “treated area,” defined in the regulation as “any area to which a pesticide is being directed or has been directed,” until the REI indicated on the pesticide product label has ceased and all treated area warning signs have been taken down or covered up, with exceptions for permitted early-entry activities.²²⁰ The extent and duration of the REI will vary based on the pesticide product’s recorded level of toxicity. Some pesticide products have a single REI (i.e., 12 hours) for all crops and uses, whereas others have different REIs depending on the crop, application method, or the proposed post-application activity.²²¹ For applications in areas of enclosed space production, the employer must ensure that all workers stay out of the areas specified in the regulation before the REI has expired and all warning signs have been removed or covered.²²² Whenever two or more pesticides are applied to a treated area at the same time, the REI is automatically set at the longest applicable interval.

Employers must notify workers and others of a pesticide application through the posting of warning signs.²²³ The requirements for warning signs depend on instructions on the pesticide label (Agricultural Use Requirements section) and on the REI’s duration:

- For REIs greater than 48 hours (outdoor applications) or four hours (greenhouses), the employer must post a warning sign.
- For lesser intervals, an oral notification to workers is sufficient, unless the pesticide’s label requires both an oral and posted warning sign.²²⁴

The WPS lays out several requirements regarding the substantive content and design, physical location, and posting-duration of warning signs.²²⁵ Warning signs must be at least 14 by 16 inches, with “DANGER,” “PESTICIDES,” and “KEEP OUT” written in both English and Spanish (or the non-English language read by the largest group of workers who do not read English), and a graphic containing an “upraised hand and a stern face.”²²⁶ In **California**, the posting signs are required to show the skull and crossbones instead.²²⁷ The signs must be posted no sooner than 24 hours before the scheduled pesticide application, remain posted throughout the application and restricted-entry interval, and be removed within three days after the end of the application and restricted entry interval and before agricultural worker entry is permitted, with some exceptions.²²⁸



When certain conditions are met, agricultural employers may direct workers to enter treated areas where an REI is in effect to perform permitted activities, such as activities for which the worker entering the treated area will have no contact with anything that has been treated with the REI-applicable pesticide, regardless of whether the worker is wearing PPE.²²⁹ Some short-term activities are also permitted in treated areas during an effective REI, so long as no hand labor activity is performed.²³⁰ This exception has the potential to create confusion and some degree of risk unless the worker clearly understands which activities are permissible. Lastly, exceptions are provided for “agricultural emergencies,” limited contact activities, and irrigation activities, if all applicable requirements are met.²³¹

Compliance Deficits

Despite the REI requirements, pesticide-related illness due to early entry into treated areas remains a threat to farmworkers.²³² Reports of farm managers sending workers too early into treated areas, or disregarding entry restrictions entirely, continue to emerge.²³³ The EPA’s Incident Data System contains dozens of reports of farm and field workers entering recently treated fields and being exposed.²³⁴

Poor communication practices regarding the start and end of an REI weaken the efficacy of warning signs. Despite the requirement to remove posted signs, many remain up long after the applicable period.²³⁵ When workers and others become accustomed to seeing outdated, inapplicable signs in the field, it becomes difficult to discern when to take the signs seriously and encourages disregard for their message. Currently, there is no requirement that most signs include a timestamp that could aid workers in assessing their applicability. Labels for soil fumigants do specify that signs around fields treated with soil fumigants must include more information including name(s) of fumigant used, dates and times of application, when reentry is allowed, and an emergency contact phone number.²³⁶

In addition to problems with lax compliance with posting and oral notification requirements, the permissible exceptions to the REI allow employers to send workers back into treated areas during the period in which the risk of harmful pesticide exposure is most acute.



Worker Stories: Rosa Maria²³⁷

Rosa Maria has been in the United States for 22 years. Rosa Maria started to work at the nursery when her youngest son was of preschool age. She worked at one nursery for five years, working mostly with the soil in the greenhouse. Her second job was at another nursery where she worked for another five years.

Work at this nursery was not ideal. Pesticide safety was not strictly practiced, but Rosa Maria managed to protect herself, “yo siempre he sido resongona, no me dejaba esprayar encima. Cuando el (esprayador) echaba (pesticidas) yo me salía... el esprayador si se protegía pero a nosotros nos echaba encima” [*“I have always been rebellious, I wouldn’t let myself get sprayed on. When the sprayador sprayed, I would get out...the sprayador did protect him/herself but would spray right on top of us.”*] Rosa Maria decided to help make signs in Spanish telling workers not to enter the nursery after spraying. Rosa Maria also remembers that they were not allowed any bathroom breaks outside of the official break times. “La gente se aguanta por la falta de papeles y la necesidad.” [*“People put up with it because they are undocumented and in need.”*] There were also multiple incidents where the bosses randomly subtracted hours from people’s weekly checks. “Si (los trabajadores) reclamaban porque le quitaron horas, el patron les pasaba la tarjeta y no explicaban.” [*“If (workers) asked why they subtracted hours, the boss would simply hand them the card without explaining.”*] If workers arrived five minutes late, bosses would subtract half an hour from the time card. “Si la secretaria era hispana, pues cuidaba su puesto y no ayudaba a los trabajadores con las quejas. Si era Americana, simplemente decía que esas son las reglas.” [*“If the secretary was Hispanic, she would safeguard her job and wouldn’t help the workers with the complaints. If she was American, she would simply say that those were the rules.”*] Whenever someone developed a rash, bosses would provide “una pomadita” [*generic word for cream or ointment, “a little cream”*] and that’s as far as they helped. Nevertheless, Rosa Maria stayed at this nursery because they gave her more flexible hours. She explained that it is not easy to switch to a new job, because the places that hire undocumented immigrants prefer young workers.

Recommendations

To improve compliance and the REI's effectiveness in protecting workers, policymakers should:

- Require REI warning signs to include the date and time at which the relevant entry restriction commences and ceases.
- Require REI warning signs to include the name of the pesticide and product involved in the application.
- Require warning signs for applications with an REI greater than 24 hours; doing so would help address barriers in communicating such warnings orally, such as language barriers, absences, memory lapses, failure of communication between commercial applicators or producers and farm labor contractors, or negligence by supervisory staff.²³⁸
- Require employers to document the method, location, date, and time that warnings were communicated to workers. This form could also include a certification regarding whether the employer provided a “refresher” training for workers on pesticide safety practices at that time.
- Rescind the “agricultural emergency” and other early reentry exceptions to the REI requirements and review alternative means for agricultural establishments to recover losses from “agricultural emergencies” through insurance or indemnification rather than putting workers in jeopardy.
- Fund research, or commission an additional unit in the NAWS, to better document the incidence and cause of REI violations and current use of the REI exceptions. While there are many anecdotal accounts of such incidents, recent research on this specific question appears limited and is important for assessing the efficacy of the REI requirements.

Personal Protective Equipment

Proper use of PPE in the presence of pesticides can significantly reduce exposure and risk.²³⁹ First introduced as a requirement for “protective clothing” in the 1974 WPS, more robust provisions have been in place since 1995. Today, PPE includes specialized equipment and clothing that is worn by handlers and early-entry workers—workers performing certain tasks in a treated area during a REI—to minimize their exposure to pesticides and other hazards in the workplace.²⁴⁰ Even though hand labor may cause a worker to “have substantial contact with surfaces that may contain pesticide residues,” workers performing these tasks are not explicitly encompassed in the PPE mandate.²⁴¹ This report discusses the PPE requirement because it applies to workers performing handler activities and early-entry workers, and some advocates have suggested PPE provision for other workers as well.

Requirements Overview

The WPS governs the selection, use, maintenance, and disposal of PPE as well as training requirements. PPE includes eyewear, coveralls, and “chemical resistant” items including aprons, gloves, footwear, headgear, suits, and respirators. General work clothing is not considered PPE under the rule,²⁴² although pesticide labels may require such clothing (e.g., long-sleeved shirts, long pants). Handlers using respirators, including N95 masks, must also receive medical evaluations, fit tests, and instructions.²⁴³ Employers are responsible for providing suitable PPE that is clean and functional, as well as examining all PPE for leaks, holes, tears, or signs of wear before each day of use.²⁴⁴ Damaged equipment must be promptly repaired or discarded.²⁴⁵ Employers must ensure proper PPE use and adherence to manufacturer instructions.²⁴⁶ Employers are also expected to provide handlers with designated clean areas away from pesticide storage and usage zones.²⁴⁷

PPE requirements vary based on pesticide toxicity. Pesticide labels specify the required PPE type and material (e.g., “chemical resistant,” indicating that the material prevents any detectable movement of the pesticide through it during use; “waterproof,” indicating that the material doesn’t allow any measurable movement of water or aqueous solutions through it during use).²⁴⁸ The label also includes instructions regarding any modifications to the PPE requirements under different circumstances, such as early entry into a treated area.²⁴⁹

Compliance Deficits

A range of factors can negatively impact compliance with PPE recommendations. Hindrances can include uncomfortable or poor-fitting PPE;²⁵⁰ perceptions that PPE that can slow down work;²⁵¹ inadequate supply, whether due to employer negligence, high costs, or shortages caused by external circumstances such as wildfires or, most recently, the COVID-19 pandemic;²⁵² and poor training on PPE usage and importance.²⁵³ Complacency may also develop if one does not experience an acute episode of pesticide poisoning; exposure can contribute to long-term health issues that are not readily apparent and may not be weighed against other factors (e.g., discomfort). Poor adherence by co-workers and supervisors can also negatively influence adherence among peers, particularly less-experienced workers.²⁵⁴ Stakeholders working directly with farmworker communities report worker stories of supervisors discouraging use by taunting workers or making deprecating comments, insinuating that a worker is “weak” or “feminine” for wearing protective gear.²⁵⁵ Workers have also reported incidents of employers telling them to buy or bring their own gear.²⁵⁶

Working in high-temperature conditions presents additional challenges with PPE. In extremely hot weather, workers and handlers can face increased medical risks (e.g., heat stroke) if they exert themselves while wearing appropriate PPE.²⁵⁷ Paradoxically, wearing protective gear or clothing may be harmful in these situations, and workers may, rationally, opt to go without. The WPS requires specific training on how to prevent and treat heat-related illness due to prolonged PPE use,²⁵⁸ but the risk remains present and may be difficult to mitigate. Additionally, elevated

temperatures facilitate the easier penetration of chemicals through both the PPE and the skin, which may be further compounded by areas of high friction.²⁵⁹ A study with tobacco farmworkers in **North Carolina** found that “once clothing becomes wet with rainwater, dew, or sweat, it no longer provides adequate protection and may, in fact, increase absorption for both pesticides and nicotine.”²⁶⁰ Exposure risks rise further as heat increases pesticide volatilization, which can lead to both more absorption and inhalation of pesticide vapors and higher application rates.²⁶¹

As noted above, the WPS PPE requirements do not extend to workers performing tasks on or near pesticide-treated crops after the restricted entry interval has passed. The required WPS training instructs workers to “wear work clothing that protects the body from pesticide residues” when “working in pesticide treated areas,”²⁶² and advises workers, after working in a pesticide-treated area, to wash and change as soon as possible, to wash work clothes (separately) before re-wearing them, to remove work boots before entering the home, and to remove work clothes and wash before physical contact with family members.²⁶³ Beyond education, the rule imposes no obligation on employers to support workers in following this advice. In one focus group study, workers identified employer provision of gloves to all workers as a desirable change to the status quo.²⁶⁴

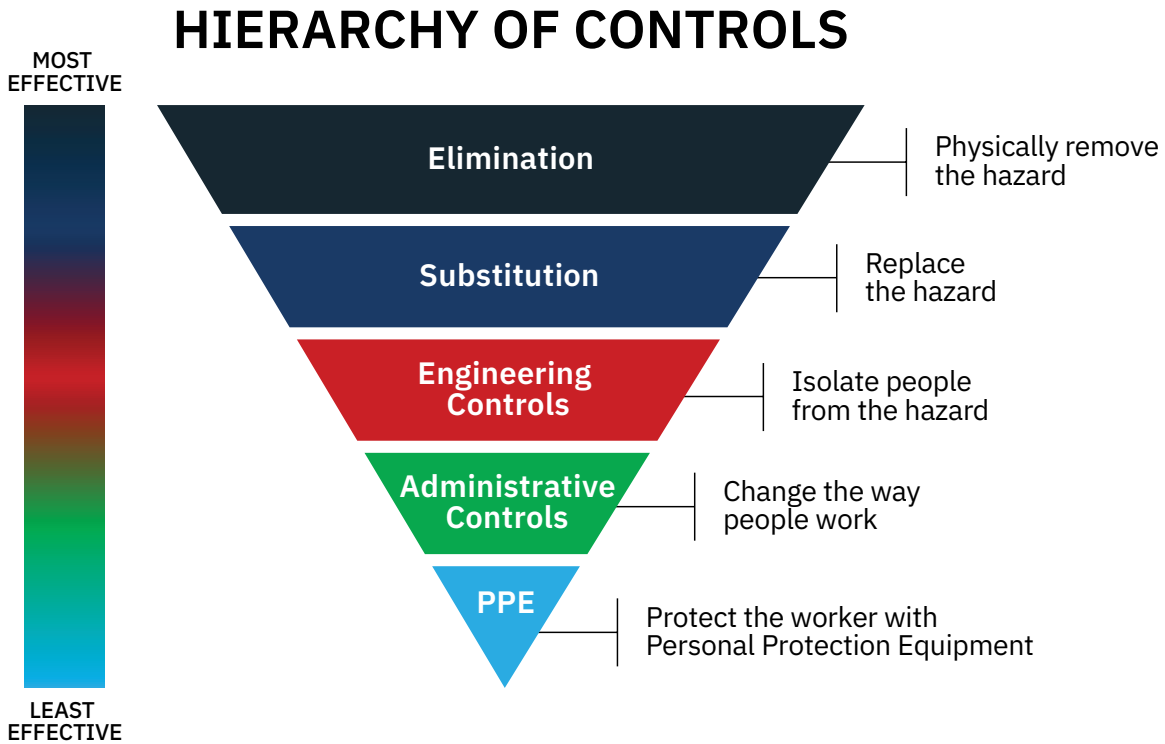


Worker Stories: Marcela²⁶⁵

Marcela arrived in the United States at age 20 and worked with a nursery for 10 years. At the time, this was a small nursery with only 10 other employees. Marcela planted and weeded plants using her own protective gear: purple latex gloves “como los del doctor” [*“Like doctors’ gloves.”*] Marcela had to buy the gloves for herself and replaced them often because they tore easily. She recounted that when spraying fertilizers, the sprayers wore mouth and nose covers as well as gloves. The “esprayadores” as they call them, sprayed pesticides while the rest of the workers were in the same room. Non-esprayadores do not receive protective gear during or after spraying. Marcela also explained that there were no signs to explain to workers that they should leave the room and come back at a later time. Marcela and her co-workers at this nursery never received any pesticide training or information about the dangers of pesticides during the 10 years that she worked there. Nevertheless, Marcela explained that she is aware that sometimes the health effects of pesticides come later. However, she says that there are few other choices for work; the majority of employment is either in construction or in nurseries.

With these complicating factors in mind, it is worth noting that PPE should not be the sole mechanism for protecting handlers and workers from exposure. Of the potential avenues for reducing hazard exposure, as set forth in the Centers for Disease Control and Prevention’s (CDC) “hierarchy of controls,” PPE sits at the very bottom—the last line of defense.²⁶⁶ Thus, even with

PPE, employers should identify opportunities to eliminate the hazard, substitute or replace the hazard (with a less hazardous alternative), implement engineering controls to isolate people from the hazard, and implement administrative controls to alter the way people work.²⁶⁷ In the WPS context, this can look like transitioning away from reliance on pesticides, transitioning to less toxic pesticides, and adhering to or exceeding the baseline entry-restriction requirements, discussed in the previous section.



Source: Hierarchy of Controls, CTRS. FOR DISEASE CONTROL AND PREVENTION (Jan. 13, 2015), <https://www.cdc.gov/niosh/topics/hierarchy/default.html>

Recommendations

To improve compliance with the PPE standards in the WPS, policymakers should:

- Encourage or require certification (via signature) from the worker that their employer has provided them with properly fitting PPE and/or the worker has access to the employer-provided PPE they need at the facility.
- Encourage or require employers to make gloves and clothing storage and changing areas available to all workers.

- Provide regular grant funding for agricultural producers to purchase PPE for employees, along with outreach and education and technical assistance for PPE provision. During the COVID-19 pandemic, the USDA provided Pandemic Response and Safety Grants to reimburse producers for PPE purchases, and Congress should authorize funding during non-crisis times to relieve producers, especially smaller farms, of PPE's cost burden.²⁶⁸ The grant agreement should require producers to provide ample, paid time for employees to put on and remove PPE.
- Support research to develop effective auxiliary cooling system PPE, such as cooling garments, made from lighter materials that workers can wear comfortably in the heat without risking heat illness.²⁶⁹ Better-fitting, lighter PPE would be more comfortable for workers and increase the likelihood of consistent use.
- Support research to examine the distinct PPE needs of women and minors.

Decontamination Supplies

Despite WPS provisions designed to prevent workers from coming into contact with pesticides, exposures still occur. Workers may come into contact with pesticide residue or pesticide drift due to violations of the entry restrictions described above as well as in circumstances where those requirements have been followed. With any exposure, it is critical that employers make decontamination supplies readily available to workers to wash themselves and limit the exposure to the greatest extent feasible.

Requirements Overview

As part of the WPS' measures to mitigate harm following exposure, the regulation mandates that employers provide supplies in specific locations as well as means to wash off pesticides and pesticide residues for workers who will come in contact with anything that has been treated with a pesticide, including soil, water, and plants.²⁷⁰ Employers must provide:

- Decontamination supplies, including soap, water, and single-use towels (and extra clothes if needed).²⁷¹ Waterless cleaning supplies, such as gels or other agents, are not acceptable under the rule's requirements.²⁷²
- At least one gallon of water for each worker performing hand labor in a field under an REI within the previous 30 days and three gallons of water for each pesticide handler and early-entry worker at the beginning of each work period.²⁷³ Access to clean natural water sources may suffice.²⁷⁴
- An adequate eye wash system for pesticide handlers actively applying pesticides, in addition to one pint of water in a portable container for eye washing when eye protection is required on the label.
- Information to workers, in an understandable manner, about the location of decontamination supplies when workers begin employment and before workers perform tasks in areas that have been treated with pesticides in the last thirty days or where there has been an REI in effect.²⁷⁵

Supplies must be reasonably accessible and located a quarter mile or less from the work site and at the site where pesticides are mixed and loaded into application equipment. If worker activities are occurring more than a quarter mile from the nearest vehicular access point, the employer must provide soap, single-use towels, and water at the nearest place of vehicular access.²⁷⁶ For workers engaged in WPS-permitted early-entry activities, supplies should be available at the site where workers remove their personal protective equipment.²⁷⁷

Compliance Deficits

Employers do not always provide the decontamination materials and facilities required under the rule. Stakeholders noted that decontamination supplies are often too far from the workers' location to serve their intended purpose. For example, workers may start their shift near the decontamination supplies but end up out of reach as they move across the field during the day.²⁷⁸ To mitigate this concern, some growers keep decontamination supplies on the bed of a truck that moves with the workers.²⁷⁹ Such a solution only works when there is vehicular access through the area that permits appropriate access.²⁸⁰ Other deficits are more directly attributable to poor planning or neglect, such as failing to maintain sufficient supplies relative to the size of the workforce, removing the supplies from the area too early, or miscalculating the required quantity of fresh water per employee.

Workers' use, or lack thereof, of decontamination supplies is also influenced by contextual, cultural, and structural factors. Some factors include the duration of break times, employers' and crew leaders' adherence to safety practices (i.e., group norms), and whether workers are compensated piece-rate versus hourly, among other factors.²⁸¹ Piece-rate pay—which encourages persistent work—and fear of retaliation discourage workers from taking breaks during which they could wash pesticide residue from their hands. Worker practice with respect to washing off residue is a prime concern; in studies of farmworkers' health practices, protective clothing behaviors were commonly practiced, but washing behaviors in the field were not.²⁸² Washing before eating is often not feasible if the meal break is taken in the middle or other side of a field. Observational studies have found that it was uncommon to observe washing behavior before eating, even when washing supplies were made available.²⁸³ The socio-cultural factors influencing these practices are discussed further on page 71.





Worker Stories: Melisa²⁸⁴

Melisa has been in the United States for 13 years and worked at a nursery in Florida for most of that time. Her duties at the nursery include weeding, cleaning plants, cutting plants, planting, watering, fertilizing, and preparing orders. She explained that it is very hot inside the nursery, so it is imperative to drink lots of water. It is also important to bring good shoes, because the floor is slippery with mold and water. Melisa explained that the nursery has been kept in worsening conditions for many years, under the pretext that they are going bankrupt. “Hubo un tiempo en que ni agua nos daban. Ni papel higiénico!” [*“There was a time when they didn’t even give us water. Nor even toilet paper!”*] They never provided workers with gloves, so workers had to buy their own. Melisa calculated that a box of gloves lasts less than a couple of weeks.

During the height of the nursery’s success, the company had two nurseries employing over 80 workers. The owners offered some benefits to workers at this time (e.g., sick leave). However, Melisa said they never showed them any videos on pesticides nor explained anything about the dangers of using them. “A veces esprayaban a dos líneas de uno y con el movimiento del aire igual nos caía todo el espray...antes (personas externas) iban a chequear las nurseries, entonces ponían los avisos de no entrar despues de sprayar.” [*“Sometimes they would spray two rows from you and with the movement of the air, all the spray would still land on us...before, (people from outside) would come to check on the nurseries, so they would put up the signs saying not to enter because they had just sprayed.”*] But now, since no one has come to check whether nurseries follow the regulations set for pesticide use, the safety practices at the nursery have been widely ignored. “Incluso el que espraya (el pesticida) no tiene ni el traje (traje de protección) porque el traje ya está muy viejo.” [*“The guy who sprays (the pesticides) doesn’t even have the suit (protective suit) because the suit is so old now.”*]

Recommendations

To improve compliance with the decontamination supplies provisions in the WPS, policymakers should:

- Provide grant funding through the USDA to support development and implementation of carriers or devices that can better mobilize decontamination supplies, water and cups, and temperature-controlled food storage through the fields. The entire work area is not always accessible by vehicle, which limits access to decontamination and other supplies. The technology is already available for robotic crop carriers to assist humans in the fields by carrying up to 500 lb. of crops in all conditions, and similar technology could be applied to ensure workers have access to important supplies.²⁸⁵
- Ensure that WPS training adequately and sensitively provides education concerning the importance of washing behaviors to reduce pesticide exposure, in a manner that respects the presently held beliefs of some workers concerning bodily health and safety.
- Guarantee workers compensated at a piece-rate wage receive at least the applicable minimum wage for all hours at work. This would entail amending the Fair Labor Standards Act to remove the current minimum wage exemptions for piece-rate work and farms with fewer than 500 man-days of labor, as well as changes to relevant state laws.
- Require workers to be compensated for breaks and non-productive time (e.g., washing, donning and doffing PPE) separate from their piece-rate compensation. For example, in California, the rate of compensation for rest and recovery periods is the average hourly rate over that work week (exclusive of break times, i.e., the average piece-rate wage) or the applicable minimum wage, whichever is higher.²⁸⁶

Emergency Assistance

Pesticide exposure can cause a range of acute symptoms and can cause serious illness, injury, and even death if not treated properly. A medical professional is needed as soon as possible following exposure to evaluate the risks and prescribe the most appropriate course of care. Unfortunately, many health care providers lack education on recognizing pesticide poisoning and the symptoms can present as symptoms of other illnesses. It is therefore critical that the employer ensures a worker suffering an exposure receives appropriate medical attention quickly and that the health care provider receives accurate information concerning the pesticides to which the worker may have been exposed.

Requirements Overview

The WPS requires employers to provide employees with prompt transportation to a medical facility, such as a “hospital, clinic, or infirmary offering emergency health services,” to mitigate harm when there is suspected pesticide exposure, or the worker has symptoms of pesticide

exposure, such as fever, vomiting, chills, and dizziness.²⁸⁷ Additionally, the employer must share the Safety Data Sheet (SDS) information and the exposure circumstances with the medical personnel treating the employee.²⁸⁸ In some cases, the EPA permits “trained first aid provider[s]” to attend to workers at the job site, but the employer is still required to transport the employee to a medical facility and provide the health care personnel with the pesticide information.²⁸⁹ The emergency assistance requirement applies only to current employees or new employees who experience acute exposure at the workplace within 72 hours of their employment.²⁹⁰

Compliance Deficits

At first glance—data disparities notwithstanding—compliance with the emergency assistance requirement appears strong because there are not many violations reported to the EPA each year.²⁹¹ For example, between 2015 and 2021, states reported 96 violations, and only one year had more than 16 violations nationally (2018 with 28 violations). However, such violations are more challenging for an inspector to uncover because they depend on worker complaints and candor. The rate of noncompliance with this requirement is therefore likely much higher than the EPA WPS Dashboard suggests. Several factors can contribute to noncompliance, including confusion around identifying a pesticide exposure, worker concerns with seeking treatment, employer desire to conceal incidents, lack of employer preparation, and structural barriers to accessing medical facilities.

First, the requirement only applies when there is a suspected pesticide exposure or symptoms of a pesticide injury and, in practice, relies on a worker knowing they are experiencing pesticide illness and wanting to seek treatment. In many cases, workers do not know that they are experiencing a pesticide injury.²⁹² Pesticide illness resembles the flu, allergies, and green tobacco sickness (nicotine poisoning from handling tobacco plants)²⁹³ and includes symptoms of nausea, vomiting, dizziness and headaches, skin rashes, respiratory difficulties, and eye irritation. It is also easily mistaken for heat illness or a respiratory or skin allergy.²⁹⁴ Therefore, workers may assume the illness is temporary and choose to wait for the sickness to subside rather than notify someone.

Additionally, a worker may not be aware of a recent pesticide application because of language barriers, the employer’s failure to notify workers of a recent application, or drift that occurs from application on nearby fields for which they did not receive notice, thereby impeding their ability to identify the cause of their symptoms. In other cases, a worker may start experiencing symptoms after work hours and in the absence of employer support to seek medical care.²⁹⁵ Workers are also reluctant to lose work time or afraid of incurring medical expenses. Workers’ compensation can address these concerns by covering costs and portions of lost income. However, as discussed below (page 74), many states do not require employers to carry workers’ compensation insurance for agricultural workers, and even where it is required, workers are often unaware of the rights and protections it affords them.

Workers may also not seek medical care for fear of retaliation. H-2A workers especially tend to work through illness out of fear they will lose their visa if they stop working due to illness.²⁹⁶ For undocumented workers, there is also fear that going to the doctor will make their presence known to the government and lead to deportation.²⁹⁷ For all workers, blacklisting from future employment, losing one's job, and retaliatory mistreatment at work are real fears.

Employers and farm managers may also wish to conceal pesticide exposure incidents. Some supervisors will discourage workers from seeking medical attention for fear of triggering an investigation or further scrutiny. When an employer carries workers' compensation, they may also discourage reporting out of concern for increased premiums in the future.

An employer's lack of preparation can also be a barrier to compliance with the emergency assistance requirement. Supervisors may not know how to transport workers or what medical facility to contact. The EPA advises employers to have an emergency response plan, but developing a plan is not a part of the WPS.²⁹⁸ State extension services can offer guidance on how to develop an emergency response plan.²⁹⁹ Examples of advice include "designating an emergency response coordinator, maintaining a list of emergency response agencies, preparing a map of the facility, keeping a current product inventory of the types and quantities of stored chemicals, [and] knowing what emergency equipment and supplies are available."³⁰⁰ Some state OSHA programs require or encourage employers to maintain an Injury and Illness Prevention Plan that can serve this purpose and go several steps further by requiring a more robust hazard analysis and mitigation assessment.³⁰¹ **California** requires employers to maintain a written Injury and Illness Prevention Plan that includes hazard communication, assessment, investigation, correction, and emergency procedures, including for pesticide incidents.³⁰² Even in states where no plan is required, prudent employers can adopt such a protocol.

Even if there is a known pesticide injury, medical facilities and services are sparse in the rural areas where most farms are located.³⁰³ For a quarter of rural Americans, the travel time to the nearest acute care facility averages 34 minutes.³⁰⁴ The alarming rate at which rural hospitals are closing further complicates the issue.³⁰⁵ However, hospitals are not the only facility available for employers to meet the emergency assistance requirements. Federal grant-funded migrant and community health centers offer care to migrant and seasonal agricultural workers (MSAWs) in 40 states and served over one million workers in 2021, primarily in **California, Washington, Florida, and North Carolina**.³⁰⁶ While community health centers serve all agricultural workers, migrant health centers (MHCs) primarily serve MSAWs and are located in smaller communities where workers reside.³⁰⁷ Ensuring that employers and supervisors are aware of the MHCs and other community health centers (CHCs) near the operation is essential to meeting the emergency assistance components of the WPS. Still, neither MHCs nor CHCs are prevalent everywhere.³⁰⁸ Mobile health clinics also have a role to play, though their temporary nature creates similar challenges. Minute clinics and retail health clinics may also fill some gaps. More policy and infrastructure support are needed to provide sufficient emergency care in rural areas, which, in turn, will support access to services in the case of exposure.



Pesticide Training for Health Care Providers

Although the WPS does not impose specific requirements on medical providers, worker health and safety depend on effective and accessible care. Even when workers receive transportation to the medical facility, the medical provider often misdiagnoses the illness as an allergic reaction or heat illness. Medical personnel may not have the information nor the training that they need about the pesticide, and there may be language barriers at the medical center. When a clinic is an employer's designated clinic under workers' compensation, personnel may also encounter pressure to designate injuries and illnesses as non-work-related to evade coverage.

Studies have shown that there are significant gaps in knowledge about pesticide exposure among health care providers.³⁰⁹ According to one study, 71 percent of health care providers (nurse practitioners and physician assistants) reported feeling uncomfortable with recognizing and appropriately treating agricultural-related diseases, including pesticide exposure.³¹⁰ Stakeholders report that many providers do not know the appropriate questions to ask, how to take an exposure history, how to address a pesticide-related illness, or even that there's a reporting requirement in states that have one.³¹¹

Even MHCs can struggle to provide appropriate care to farmworkers seeking treatment for occupational injuries.³¹² A Migrant Clinicians Network survey of health care providers serving migrant farmworker communities found that nearly half had received no training related to pesticides or environmental and occupational health more broadly.³¹³ Further, a majority of primary health care providers report feeling unprepared to answer medical questions about pesticides or inquire with patients about possible pesticide exposure.³¹⁴ Sensitivity to employer-worker power dynamics and other risks farmworkers face is also lacking but critical for providing effective care.

For the Emergency Assistance provision of the WPS to be effective, additional training, tools, and resources should be directed to these farmworker-serving health clinics to ensure providers are equipped to address pesticide-related illnesses and injuries. This should be a core component of any future EPA grants for improving health outcomes of workers and communities with respect to pesticide exposure.



Worker Stories: Sandra³¹⁵

Sandra came from Guatemala nine years before participating in the interview. She has worked for the same family that owns a set of nurseries. Her duties included planting, moving soil, cutting plants, and filling trays with young plants. Sandra described the work environment: “Ellos quieren que uno siempre se apure...y contal que no nos corran, pues dale más, a trabajar más rapido.” [*“They want you to always rush...and just so that they don’t fire you, well you just give more, go and work faster.”*]

Sandra developed a severe rash on her arm while she was still working. They had sprayed pesticides on the plants the day before, and the mist on the surface of the plant rubbed off on her arm. Sandra had a burning sensation that very instant. She tried to tell her boss “pero no me hizo caso el patron.” [*“But the boss just ignored me.”*] She continued to work. By evening time, the arm was covered in white bumpy blotches. Again, she went to her boss, and he simply dismissed it, saying that the rash couldn’t have been from the chemicals in the nursery; those didn’t affect the skin. Sandra kept working for the following six months despite the continuing rash and the burning sensation on her arm.

Sandra eventually went to the clinic on her own, and doctors prescribed medications for her arm. However, her rash was never documented as a work-related injury. Sandra explained that if she had asked for financial help or documentation of her injury, her boss would have fired her. She lied at the clinic and said the rash “simply appeared.” When the clinic staff asked her if she worked at a nursery, she denied it. “Hay muchas cosas que uno se reserva porque uno tiene que seguir trabajando... ni modo. Tenía que seguir, llega el cheque y cada dollar tiene su destino y a uno no le queda nada. Tengo a mi mama allá enferma, tengo a mi nino, los bills...por eso protegemos estos trabajos.” [*“There are many things that you keep to yourself because you have to keep working...there is no other way. I had to go on; that check arrives, and every dollar has its purpose, and you are left with nothing. My mom is sick over there, I have my little boy, the bills...that’s why we protect these jobs.”*]

Recommendations

To improve compliance with the emergency assistance standards in the WPS, policymakers should:

- Provide employers with pocket-sized cards that list pesticide illness/poisoning symptoms and supervisor and emergency medical services information for workers to carry with them. The cards should also be available to download through a QR code that workers with smart phones can always access.
 - Additionally, the card could indicate that the cardholder works with pesticides and be presented to providers upon arrival at a clinic so that the provider is informed of the potential risk and reminded of relevant symptoms.
- Train employers and supervisors to recognize pesticide exposure symptoms. The employer can comply with the emergency assistance requirements more quickly if they can recognize symptoms of pesticide illness. Symptom awareness can also prevent bias and discrimination from improperly influencing a supervisor's assessment of the employee's symptoms.³¹⁶
- Encourage or require employers to have and regularly test an emergency plan or an injury and illness prevention plan that details what to do in the event of a suspected pesticide exposure, including whom to call and how to transport employees to medical facilities. The EPA and the Department of Homeland Security already recommend that employers have an emergency preparedness plan, and the guidance should become part of the WPS.³¹⁷ Employers with emergency plans increase their capacity to comply with the emergency assistance requirement when there is a suspected pesticide exposure.
- Require health centers that receive federal funding to maintain and provide information and resources concerning pesticide exposure, including risk mitigation, exposure and symptom recognition, rights and protections, treatment, and health risks. These materials should be workshoped and developed with farmworkers to ensure accessibility and efficacy.
- Expand resources for mobile health clinics so they are equipped to serve the diverse farmworker community. Migrant health centers and community health centers are essential to farmworker health, but they need more support to reach diverse farmworker populations. Strengthening the infrastructure for mobile clinics that can reach the farms quickly and are prepared to meet the needs of farmworkers would make it easier for employers to comply with the emergency assistance requirement in the event of a suspected pesticide exposure.³¹⁸ Funding could support better training and research to detect and treat pesticide exposure, operational and capital costs, and targeted relationship-building with employers to improve on-farm accessibility.
- Encourage or require employers to provide workers' compensation or compensate workers for time spent seeking medical attention and for recovery time for pesticide illness or injury.
- Provide grant funding and resources to support provider training on identifying and treating pesticide illness/poisoning and research that would help providers more quickly and accurately diagnose and treat patients.



FACTORS SHAPING THE COMPLIANCE LANDSCAPE

VARIOUS FACTORS INFLUENCE WPS COMPLIANCE AMONG GROWERS AND ADHERENCE BY WORKERS. These factors include socio-cultural dynamics and economic considerations as well as legal, administrative, and private structures and entities. Following an examination of socio-cultural and economic factors at play, this section highlights the roles of workers' compensation, retaliation protections and reporting systems, the H-2A visa program, farm labor contracting, private compliance oversight, and organic agriculture in shaping worker safety.

Socio-Cultural Factors Affecting Growers

Several factors affect an employer's inclination and ability to comply with the WPS, including their general risk perception, their awareness and understanding of the regulations, and their attitude toward the workers employed in their operations.

Risk Perception

First, a grower's perception of pesticide risks may affect WPS compliance. Growers face known risks every day, such as working with hazardous equipment, weather changes, yield uncertainty, and price fluctuations. Because farming is inherently risky, growers are generally comfortable with higher levels of risk.³¹⁹ They also tend to believe they can control how they respond to risks (and whether they choose to engage with the risk at all) because they have the information needed to make informed decisions and the privilege of making the decision about how to manage the risk.³²⁰ Even though growers may understand the safety concerns associated with pesticides generally, they often do not perceive those risks as being particularly acute or serious for the workers they employ,³²¹ or even for themselves. Studies demonstrate that growers may

fail to appreciate the pesticide risk to farmworkers because they believe that the risk resides with the mixing and handling of the pesticides and not in tasks like harvesting.³²² Further, the grower ultimately responsible for complying with the WPS may have little interaction with workers in the field, relying on farm managers or crew leaders (employed by the farm or separately by farm labor contractors) who act as intermediaries.³²³ This separation can foster their belief that pesticide exposure risk in the field is minimal. Finally, the profit motive to rely on pesticides to increase yield and the desire to conduct an efficient harvest may further bias a grower's perception of the risk involved (i.e., their risk-reward calculus).³²⁴

Limited Understanding

Certain growers also seem to lack awareness and understanding of the WPS requirements. Stakeholders interviewed for this report conveyed a prevailing sense that older growers who have managed operations since long before the 2015 Rule changes are more likely to continue to operate under the prior rules and have not brought their policies and practices up to date. Additionally, smaller-scale operations with fewer resources reportedly struggle with navigating their regulatory obligations, either because they do not fully appreciate their responsibility or because they perceive or experience a burden on their resources to fully implement their responsibilities. Further, some growers mistakenly believe that because small farms enjoy exemptions from other labor protections in some states, such as field safety regulations enforcement by federal OSHA (for farms employing 10 or fewer workers),³²⁵ they are exempt from WPS protections as well. Intentional or inadvertent, these misunderstandings inhibit compliance and put farmworkers at risk.

Negative Perceptions of Workers

Finally, a grower's negative perceptions or beliefs about their workforce may exert a subtle or overt influence over their concern with compliance. Most growers identify as white while most farmworkers identify as Hispanic or Latino/a (with a smaller proportion identifying as Haitian, Jamaican, and other ethnicities).³²⁶ Many workers are immigrants and/or speak English as a second language or not at all.³²⁷ Perceiving one's workforce as "other" or holding negative stereotypes can diminish an employer's regard for their employees' health and safety and contribute to harmful assumptions.³²⁸ For example, researchers have found that some growers believe that farmworkers come from a "backward society" lacking modern sanitation facilities, which leads the grower to assume that is why workers do not use them.³²⁹ Other research revealed that some growers ignore reports of work injuries from immigrant farmworkers with limited English language skills, forcing those workers to work through the pain, while at the same time providing breaks and time off for English-speaking, U.S.-born farmworkers who report injuries.³³⁰ Conscious and unconscious biases can therefore influence grower commitment to the WPS to some degree.

Socio-Cultural Factors Affecting Workers

Socio-cultural dynamics also affect workers' adherence to the safety practices encouraged under the WPS and ability to enforce their rights. Risk perception, language barriers, cultural differences, and power dynamics each present challenges.

Differing Beliefs About Risks and Health

Workers' risk perception can impact adherence to protective behaviors. Studies suggest that farmworkers are not aligned on the question of whether pesticides are dangerous. Some farmworkers have higher perceptions of the risks than their employers, but others perceive pesticides as safe, believing that growers would not use harmful chemicals.³³¹ Studies suggest that workers often require sensing the pesticide (seeing, feeling, tasting, and sometimes smelling) to be aware of the pesticide's presence and risk.³³² Even when the pesticide is detected, many workers also think they can do little about the risk, which results in decreased self-protective behaviors.³³³ Farmworkers are often not aware of other, less risky employment opportunities; without viable alternatives, their vulnerable financial needs outweigh the costs of pesticide exposure for many.³³⁴ Further, workers may not perceive a risk if they work around pesticides and do not experience or observe acute exposure symptoms, even though some of the potential negative health impacts develop over time. Stakeholders report that younger workers are often less aware of and concerned about the risks. Other barriers, such as language differences between workers and supervisors and between workers and inspectors, may also lead to a misunderstanding about the risk and a reluctance to seek assistance with safety practices.³³⁵



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Workers may also hold beliefs about individual health that can influence behavior.³³⁶ Some farmworkers may believe the effects of pesticide exposure depend on the individual person, with some being more sensitive to pesticides than others.³³⁷ Workers interviewed for one study reported varying susceptibility to pesticides' effects (e.g., "It hurts some people and it doesn't hurt others[.]" ; "Chemicals affect people differently, depending on their strength and constitution.").³³⁸ Additionally, many farmworkers believe that the health impacts from pesticides are short-term and may not be aware that pesticide exposure can cause long-term health consequences.³³⁹ For example, one study found that among the male seasonal farmworkers interviewed, "most indicated that if someone got sick from pesticide exposure and did not receive treatment, the effects would last a few hours, or as long as a day."³⁴⁰ Some workers may hold health beliefs that further discourage protective behaviors. For instance, a belief that applying cold water to a hot body may cause illness—common to some cultures—could discourage one from using cold water to wash off pesticide residue when working in a hot environment.³⁴¹ In a study documenting worker perceptions of their work environment, one worker shared that the grower wanted to provide iced water but the worker waited to wash up at home with hot water because they believe that "when you are working and your hands are hot and you get them wet" you can develop rheumatism (i.e., arthritis).³⁴²

Interactive and engaged training can help overcome these barriers through techniques such as sharing personal experiences with pesticides, case studies, hands-on activities, and use of a fluorescent tracer and non-toxic powders or lotions to simulate pesticide residue and help workers visualize the effects.³⁴³ Education provided by peers, promotores, or other organizations and individuals with similar cultural backgrounds or practice with culturally sensitive training can go a long way to overcome these barriers to protective behavior. Educating workers on the real risks and why and how protective behaviors can mitigate those risks can empower workers to better protect themselves and their families. Of course, growers must adhere to their other obligations under the WPS for workers to be able to protect themselves appropriately.

Language Barriers

Recent survey data indicates that 63 percent of U.S. farmworkers were born in Mexico, 30 percent in the United States or Puerto Rico, and five percent in Central America.³⁴⁴ Two-thirds are most comfortable conversing in Spanish.³⁴⁵ A significant number of farmworkers come from Indigenous communities, and some are most comfortable speaking an Indigenous language.³⁴⁶ The vast majority of H-2A workers come to the United States from Mexico, with some of those workers also identifying as Indigenous. In contrast, growers are 95 percent white³⁴⁷ and primarily speak English as a first language. As noted throughout this report, language differences hinder worker comprehension during training and with respect to the information-sharing components of the WPS. While an increasing number of resources are offered in Spanish or another language, growers typically communicate orally in English. Providing these trainings in an appropriate language is critical, as literacy levels vary among farmworkers and written materials may not be accessible. Furthermore, language barriers can deter workers from seeking assistance from others or reporting violations to state agencies or inspectors who encounter them.³⁴⁸

Uneven Power Dynamics

Power dynamics between employers and employees also present obstacles to worker safety. Workers rely on their employers to sustain their livelihood, which can make them reticent to raise concerns if employers are not taking the WPS seriously or if they observe violations.³⁴⁹ Most farmworkers are immigrants, and over 40 percent of farmworkers lack documentation to work in the United States.³⁵⁰ Both the social taboo and legal ramifications of being undocumented isolate farmworkers. These factors are compounded by the fear of losing their jobs, being unable to support themselves and their families, and being forcibly separated from their family and community in the event of deportation, all of which further discourages them from asserting their rights.³⁵¹ Undocumented workers generally avoid filing complaints or even sharing information related to their work because they fear deportation.³⁵²

Even when workers have work authorization, they are reluctant to call attention to health and safety issues because they are afraid their employers will retaliate, threatening their jobs and income. H-2A workers are especially vulnerable because their visa is connected to a specific employer, and they would have to return to their origin county if they stopped working for the employer listed on their visa.³⁵³

The power disparity intensifies for workers of a different race, ethnicity, gender, gender identity, or sexual orientation than their employer. Women and gender-diverse workers can face retaliation in the forms of sexual harassment and assault, while also encountering gender stereotypes and other forms of discrimination in the workplace.³⁵⁴

The lack of guaranteed confidentiality or anonymity in reporting WPS violations in many states only exacerbates these issues, a topic which is explored further on page 75.

Economic Considerations Facing Growers

As business owners, growers manage their operations with an eye toward revenues balanced against input costs, capital investments, and regulatory compliance. Research has found that growers generally believe they are subject to too many regulations and may experience internal resistance to compliance with additional policies,³⁵⁵ including the WPS. Regulations typically impose new costs or may pass associated costs onto an employer to meet the requirements. The employer must decide how they will meet those requirements or if the associated costs are too burdensome, regardless of whether this burden is real or perceived.³⁵⁶ Since any new costs that do not have an apparent investment payoff could reduce profits, there is little incentive for growers to comply with a regulation without a fine, fee, or other type of penalty associated with noncompliance. Often, growers wait until they have faced a fine or the stress and work disruption caused by a pesticide exposure incident before revamping their policies and practices to comply with new requirements.

Unfortunately, a grower's experience facing increased regulation and associated costs may complicate or deter compliance with relatively inexpensive obligations like the WPS. For example, in an illustrative case study, researchers at California Polytechnic State University, San Luis Obispo found that a lettuce grower in the Salinas Valley saw their regulatory compliance costs increase by 795 percent from 2006 to 2017 while its production costs increased by just 24.8 percent.³⁵⁷ Apart from assigning and training a human resources staff member to be responsible for WPS compliance, including worker training, costs to the grower to comply with the WPS are marginal. However, perceptions of over-regulation, increased costs, and regulatory fatigue could hinder compliance despite these minimal WPS-associated costs.

Compounding the issue further, the penalties assessed for WPS violations are relatively low and may be insufficient to incentivize compliance. The previous report in this series, *Exposed and at Risk*, highlighted the prevalence of minimal fines for noncompliance with the WPS. For example, in **California**, 86 percent of fines were at or below \$500. In **Illinois**, fines are levied through a point system based on the occurrence of exposure (rather than the number of people affected by the occurrence), and fines are typically less than \$1000.³⁵⁸ When fines for noncompliance are minimal—or at least less than the cost of compliance—a grower's cost assessment will weigh in favor of noncompliance. At that point, potential fines are merely the cost of doing business, and only those growers who value compliance and worker safety independent of their balance sheets will be concerned.

Low fines become an even lesser perceived cost or concern when the risk of receiving a penalty is low. As detailed in *Exposed and at Risk*, the agencies responsible for compliance inspections and enforcement activities are under-resourced and therefore understaffed. For example, the Field Operations Unit of the Pesticide Section of the **North Carolina** Department of Agriculture and Consumer Services employs 22 individual inspectors who are responsible for conducting inspections on more than 45,000 farms.³⁵⁹ Most violations result in a warning rather than a costly fine.³⁶⁰ Finally, some inspections are announced in advance, giving growers the opportunity to get things in line that day. These dynamics create a landscape that emboldens disregard for the WPS.

Workers' Compensation

On the other hand, workers' compensation regimes may incentivize growers to comply with the WPS. Workers' compensation (often called workers' comp) is a type of insurance that employers carry to cover the costs of their employees' work-related illness or injury.³⁶¹ Workers' compensation insurance is no-fault coverage. In other words, it covers the costs of work-related injuries even when the injury is the employee's fault.³⁶² Producers who provide workers' compensation insurance pay the premium to insurance companies according to the farm's safety records. When workers are injured on the farm and file a workers' compensation claim, the employer's premiums increase.³⁶³ Therefore, it is in the employer's best economic interest to comply with the WPS to mitigate the risk of pesticide injury.

compensation schemes can increase employer attention and commitment to adopting best practices and ensuring compliance on their operation. Unfortunately, the potential for increased costs may also influence employers to neglect or discourage reporting of pesticide injuries. Proper training and mandatory reporting for medical providers is critical to mitigate this concern.

Anti-Retaliation and Confidential Reporting

The WPS contains provisions intended to curtail employers' retaliatory actions against farmworkers and pesticide handlers who voice concerns or speak out against their employer.³⁶⁷ An employer violates FIFRA (the law that authorizes the WPS) when they take any adverse action against any worker or handler for: (1) attempting to comply with the WPS; (2) reporting suspected WPS violations or filing complaints with the relevant authorities; (3) participating in an investigation or other proceeding concerning WPS compliance; or (4) refusing to carry out any instructions that the worker or handler reasonably believes to be in violation of WPS.³⁶⁸ WPS training is required to make workers and handlers aware of the WPS protections against retaliatory acts.³⁶⁹

Fear of retaliation is cited as one of the primary reasons that workers are unlikely to report pesticide-related injuries and WPS violations, including retaliation or threats thereof.³⁷⁰ Even if workers are aware of the legal protections against retaliation, most are also aware of instances where retaliation has gone unaddressed and this perception of ineffective enforcement can affect workers' willingness to report.³⁷¹ If workers lack confidence that state agencies will vindicate their rights when an employer retaliates against them, they will be less willing to report violations for fear of losing their job, deportation, or even physical assault. The precarious immigration status of many farmworkers or their family members exacerbate these fears.³⁷²

Additionally, the WPS protections against retaliation are not as protective as other worker protection laws. Retaliation is an unlawful act under FIFRA in the same way that other WPS violations constitute "use [of] any registered pesticide in a manner inconsistent with its labeling."³⁷³ These violations carry the threat of civil penalties (monetary fine) and criminal sanctions in more egregious cases.³⁷⁴ But, unlike other worker protection statutes,³⁷⁵ the WPS and FIFRA do not provide for reinstatement (in the case of termination), back pay or lost wages, or other types of damages. The law also does not provide a private right of action for a worker to bring a claim for damages or to seek an injunction. While state laws may (in limited instances) provide alternative avenues for relief, the WPS should include the enhanced rights that other laws guarantee to offer workers greater protection in reporting.

Additionally, the WPS lacks any guarantee of confidentiality in reporting violations, meaning that an employer may be able to trace a complaint back to the worker. The EPA has indicated it does not have the authority to regulate the confidentiality of complaints and leaves the matter to states to handle.³⁷⁶ Some state agencies will investigate anonymous or confidential complaints; in **Florida**, for example, the enforcement agency will investigate complaints made by confidential informants if the complaint is legally sufficient and in writing, the violations alleged are

substantial, and the department “has reason to believe” the alleged violations in the complaint are true.³⁷⁷ However, there remains a concern that the employee’s name could be revealed through a public records request. Workers seeking legal counsel on whether to file a complaint would, in many cases, learn that their complaint will not be confidential and may refrain from filing for that reason. States may also accept anonymous reports of pesticide violations. However, a drawback of anonymous reporting is the agency’s inability to ask a complainant worker follow-up questions. In addition, sometimes an employer will be able to guess who filed a complaint and retaliate. It is harder for an anonymous complainant to prove retaliation.

The lack of confidentiality in reporting means that many violations are likely going unreported and unaddressed. One potential tool to address the resulting knowledge gap is an anonymous reporting and surveillance system available to workers and their representatives to document exposure or violation incidents.³⁷⁸ The data generated from such a tool could be used to better inform state enforcement agencies of predominant concerns or growers, regions, or crops that may be worth strategic enforcement attention to maximize regulatory efficiency.³⁷⁹ Such a tool, the Community Pesticide Exposure Observatory tool, has been developed by the Farmworker Collaboration Group, which receives funding from Michigan State University.³⁸⁰ The Migrant Clinicians Network serves as a facilitator and platform for this group. The primary objective of this resource is to systematically document instances of pesticide exposure at the community level within agricultural settings. Furthermore, this resource has the potential to be used to monitor other aspects of occupational health, such as the identification of heat stress. Also, it is designed to collect field information, not necessarily with all the details required by government agencies but in a manner that enables the communities to report effectively through their organizations.

Recommendations

- Amend FIFRA to provide stronger retaliation protections for workers (e.g., reinstatement, back pay, other damages).
- Establish confidentiality protections for workers reporting WPS violations.

H-2A Visa Program

H-2A workers represent a growing proportion of the U.S. farm workforce. The H-2A program allows qualifying U.S. growers to hire foreign nationals to fill temporary agricultural positions when they face a labor shortage.³⁸¹ The number of positions certified to be filled by H-2A workers has increased from just over 48,000 positions certified in fiscal year 2005 to over 370,000 in fiscal year 2022.³⁸² By 2020, H-2A workers accounted for an estimated 10 percent of the average employment on U.S. crop farms.³⁸³ Many foreign workers avail themselves of the program due to the higher wages they can earn in the United States as compared to their country of origin.³⁸⁴ Growers turning to the program must provide incoming workers with housing, workers’ compensation, and transportation to work, among other responsibilities.³⁸⁵ The H-2A law requires that employment of H-2A workers will not adversely affect the domestic workforce.³⁸⁶

Employers must therefore recruit domestic workers for open positions and pay H-2A workers (as well as domestic workers in corollary positions) the “adverse effect wage rate,” a wage rate set by the Department of Labor for a given region to protect against the wage depression that the program could cause. An H-2A visa is tied to a specific employer, meaning that in most cases the termination of employment results in the loss of work authorization and requires departure from the United States.

Despite the program’s strictures, it presents built-in challenges for both H-2A workers and domestic farmworkers. Because an H-2A worker’s visa is tied to their employer and they live in employer-provided and -controlled housing, the power imbalance between employer and employee noted elsewhere in this report is even more pronounced, and the workers are very isolated. In extreme cases, this type of dependence on one’s employer has led to labor trafficking.³⁸⁷ Domestic workers, on the other hand, see wages and working conditions stagnate or only marginally improve as employers have less incentive to significantly raise wages or improve their employment practices when H-2A workers may be available to fill gaps and accept conditions as they are.³⁸⁸ Domestic farmworkers have reported seeing positions they hoped to return to filled by H-2A workers the grower preferred to hire. Some growers may have this preference because they find H-2A workers to be a more malleable workforce—less likely to complain because they have no other employment option, less educated about their rights, and lacking knowledge of resources available to them to assert those rights.

The growing reliance on the H-2A program creates challenges for ensuring worker safety. While in 2022 just 0.03 percent of H-2A positions had the word “pesticide” in their job description, and DOL certified just 31 H-2A positions as Pesticide Handlers,³⁸⁹ most H-2A workers engage in crop farming that would put them at risk of exposure to pesticides at some point during the season. Under the WPS, these workers should be trained upon arrival to the United States and before beginning any work. Stakeholders interviewed for this report had diverse perspectives as to whether compliance with the WPS (particularly training) improves or weakens under the H-2A program. Some believed that H-2A workers in their region were more likely to receive WPS training because growers using the program are more aware of their regulatory obligations and may perceive themselves as inviting heightened scrutiny by participating in the program. A survey conducted by Illinois Migrant Legal Assistance Project found that 93 percent of the 103 H-2A workers surveyed across **Illinois** had received the required training;³⁹⁰ however, 16 percent reported they did not know they had rights to protection against pesticide poisoning.³⁹¹ Other stakeholders believe that H-2A workers in their region are not receiving the required training and that H-2A growers ignore these obligations unless workers are actually handling pesticides.

This variation is possible because the H-2A regulations do not mandate “know your rights” training or the provision of safety information for incoming workers. While an employer must provide workers a copy of the work contract (in a language they understand), which includes many provisions related to the H-2A program requirements, it does not include information about the rights and guarantees afforded them under other federal worker protection statutes. Consequently, there is wide variability—influenced by grower choice and prevailing practices in a region—regarding whether an H-2A worker will receive WPS training or learn of the protections and grower obligations under the WPS.

Recommendations

If the H-2A program continues,³⁹² policymakers should:

- Amend the H-2A regulations to specifically refer to the WPS and its general provisions as program requirements that must be disclosed in the work contract. The work contract should be provided in a language the worker understands and should be reviewed with the worker verbally if they have literacy challenges. This information should be provided before a worker takes the time and expense to travel to the United States, as well as at the beginning of the employment term.
- Amend the H-2A regulations to require additional disclosures and training regarding workers' rights and protections broadly, including the WPS. Disclosures and materials should include the informational cards and resources described elsewhere in this report.
- Amend the H-2A regulations to reduce isolation of workers by assuring that workers are allowed to have visitors at their housing locations, as the Department of Labor has recently proposed.
- Establish exit-interview procedures with H-2A workers that include inquiry into a grower's practices regarding pesticides and compliance with the WPS, with guaranteed anonymity and confidentiality.
- Increase coordination and shared authorities among state inspection officials charged with enforcing laws related to workers on agricultural establishments (e.g., H-2A housing inspections and WPS compliance).

Farm Labor Contractors

The agricultural industry relies heavily on Farm Labor Contractors (FLCs) to bridge the gap between growers and farmworkers. A labor contractor acts as an intermediary, bringing crews of farmworkers to growers who require a larger labor force for a temporary period. Unfortunately, the legal landscape surrounding FLCs is marked by confusion, creating a breeding ground for exploitation in agricultural settings. Because FLCs typically work with farmworkers most directly, the workers' relationship to the grower may be obscured. In an employment law context, the degree of control the FLC and the employer each have over the workers can affect their individual liability to the worker for unpaid wages and other legal violations. The FLC model thus diminishes employer accountability and liability for wages and working conditions; even when the grower is responsible, a worker may only be familiar with their crew leader, ultimately letting the grower off the hook. FLCs have also been found to be the worst violators of employment laws in agriculture, accounting for just 14 percent of the labor force but 24 percent of the employment law violations.³⁹³

The WPS defines the roles and responsibilities of FLCs and growers,³⁹⁴ each defined as the following:

Labor Contractor	A person, other than a commercial pesticide handler employer, who employs workers or handlers to perform tasks on an agricultural establishment for an agricultural employer or a commercial pesticide handler employer.
Agricultural Employer	Any person who is an owner of, or is responsible for the management or condition of, an agricultural establishment, and who employs any worker or handler.

While the agricultural employer can delegate certain responsibilities under the WPS to a labor contractor, the ultimate responsibility for WPS compliance lies with the agricultural employer.³⁹⁵ They bear the duty of ensuring that workers and handlers receive the necessary protections mandated by pesticide labeling and the WPS regulations.³⁹⁶ On the other hand, if the labor contractor oversees the application of pesticides, using their own equipment and PPE, they are considered a Commercial Pesticide Handler Employer and have separate duties they must abide by under the WPS.³⁹⁷

Despite clarity in the regulation, the confusion that often accompanies the breakdown of responsibilities and liabilities between FLCs and employers still permeates the WPS context. An agricultural employer may incorrectly believe that the crew leader bringing workers to the farm is responsible for ensuring those workers are trained and have access to required information and supplies under the WPS. Although empirical data is lacking, anecdotal reports confirm that deficits in WPS compliance are often exacerbated in the FLC context. However, contrary to this perception, **compliance responsibility remains with the agricultural employer.** They may arrange for the FLC to train the workers or provide supplies but must be careful to ensure that these requirements are met to avoid liability.

Private Compliance Oversight

Although the primary responsibility for monitoring and enforcing WPS compliance falls to government agencies, private entities and individuals can play an oversight role as well. As noted previously, the number of inspectors relative to agricultural operations makes it nearly impossible for public entities to provide meaningful compliance oversight, meaning that noncompliance and even egregious violations can continue unrecognized and unaddressed. Without absolving government actors of their responsibilities, private entities can play a complementary role, supporting compliance and worker protection by drawing attention to violations they uncover, working with employers to address noncompliance outside of the government's enforcement process, and through incentives and penalties that support compliance separate from the WPS penalty scheme. Worker-Driven Social Responsibility organizations, unions, and third-party verification programs can each play this role to some degree.

Worker-Driven Social Responsibility

Worker-Driven Social Responsibility (WSR) offers a private mechanism for supporting and ensuring compliance with the WPS. Developed and spearheaded by the Coalition of Immokalee Workers (CIW), which began in 1993 as a community organization of farmworkers in southwest Florida, the WSR model leverages the purchasing power of major corporate buyers (e.g., Walmart, Whole Foods, and Subway) to eliminate forced labor and other longstanding farm labor abuses and to require the implementation of humane working conditions on farms enrolled in CIW's Fair Food Program (FFP).³⁹⁸

At its core, the WSR approach ensures that “worker organizations [are] the driving force in the creation, monitoring, and enforcement of programs designed to improve their wages and working conditions” and that individual workers serve as frontline monitors of their own rights on the job. It does so via supply-chain agreements with brands and retailers that require the following: financial support to raise farmworker pay and/or help suppliers (as in the case of Northeast dairy farms in the Milk with Dignity Program) to meet the labor standards established by the program; a binding-and-enforceable commitment by the buyers “to stop doing business with suppliers who violate those standards;” and the creation of “monitoring and enforcement mechanisms designed to provide workers an effective voice in the protection of their own rights.”³⁹⁹

Tools employed in the FFP to put these principles into practice include a code of conduct designed by farmworkers themselves (e.g., the Fair Food Code of Conduct); worker-to-worker education on workers' rights under the Code of Conduct; a 24-hour complaint line, with a full complaint investigation and resolution process; and annual audits of all participating farms during which a majority of workers present are interviewed personally.⁴⁰⁰ Additionally, monthly Health and Safety Committee meetings are required, where concerns about work environment, including pesticide exposure, can be raised and corrective actions agreed upon.

The FFP offers several mechanisms that promote WPS compliance. Growers participating in FFP must abide by the Fair Food Code of Conduct (the Code), which reinforces their existing legal obligations and requires growers to “take all necessary steps to avoid endangering the safety of” workers, including by permitting workers who feel threatened or in danger of their health or safety to cease working without retaliation and by implementing a system for work safety stoppages due to pesticides (among other dangers).⁴⁰¹ Additionally, the Code considers pesticide violations to be “negligent endangerment” of workers, constituting an “Article II Violation” that requires “specified remedial action by the Participating Grower to avoid suspension from the FFP” and/or probation.⁴⁰² Suspension from the FFP means that under the supply chain agreements with major buyers, a grower could lose a significant portion of its business for having failed to adhere to the WPS.

Importantly, the FFP's 24-hour complaint line—the “línea de quejas,” staffed by a bilingual, thoroughly trained, Fair Food Standards Council investigator—with its accompanying investigation and resolution process, provides workers with a meaningful mechanism for holding their employer accountable and quickly resolving situations that threaten worker safety.

Information about the hotline and the phone number is shared with workers through trainings, “Know Your Rights and Responsibilities” booklets, cards, and on weekly paychecks. Workers further understand their rights, such as working free from pesticide exposure, as well as how and when to enforce them, due to worker-to-worker education sessions and grower-provided FFP training. The FFP’s prohibitions against retaliation and ability to more closely monitor grower behavior makes that protection more substantial—and more secure-feeling—than federal retaliation protections, which again depend on public agencies to enforce.

Taken together, the protections and oversight provided by the FFP bring safety into reach for the farmworkers employed on FFP-participating farms.

Recommendations

- Encourage grower participation in WSR programs through incentives, procurement preferences, and education about the benefits these programs offer to workers and growers.

Unions

An effective union can also provide oversight of employment conditions and establish processes for addressing concerns or legal violations that arise. A union brings together workers to act collectively to advance their common interests and negotiate with their employer over the terms and conditions of employment. Once a union is in place, it would (ideally) negotiate with an employer to establish a collective bargaining agreement (CBA), “a legally enforceable, written contract between a union representing a group of employees and an employer in a workplace.”⁴⁰³ Unions provide workers with representation and protection, empowering workers to raise safety issues that arise in the workplace. They also provide workers with a point-of-contact for discussing and understanding their rights and legal protections. In promoting better work environments, unions may also secure or encourage more effective pesticide training and continuing education. By working closely with employees at a particular jobsite, union leadership can stay attuned to the most relevant concerns at that operation. When violations arise, the union may either address deficiencies through enforcing the CBA or report legal violations to the relevant government authority.

Although unions and CBAs offer many advantages, federal and state policy has restricted the availability and efficacy of these tools for farmworkers. Farmworkers are exempt from the protections of the National Labor Relations Act, so if workers come together to bargain collectively, their employer has no obligation to negotiate with them or even to retain those employees. Some states go beyond federal law and protect farmworkers’ rights to bargain collectively, including **California, New York, and Washington**.⁴⁰⁴ Still, some of these laws limit farmworkers’ right to strike, effectively gutting one of the most powerful tools a union has in the negotiation process.

Seasonality, migration, rurality, and other factors can make it challenging to unionize farmworkers even in states that offer protections. Union participation is exceptionally low, with some researchers reporting that farmworker union membership across the United States is statistically zero.⁴⁰⁵ Some exceptions include Familias Unidas por la Justicia (Washington); United Food and Commercial Workers (multi-state); Farm Labor Organizing Committee (FLOC; multi-state); AFL-CIO (multi-state); and United Farm Workers (multi-state). Where a union and bargaining protections are present, a CBA is often still difficult to achieve as employers resist negotiations and coming to an agreement.⁴⁰⁶ More protections and support are therefore needed for unions to provide an effective, private mechanism for reinforcing the WPS requirements on farms across the country.

Recommendations

- Establish a federal floor protecting farmworker labor organizing that permits state law to go further and that does not preclude entry into or enforcement of supply chain agreements.





Third-Party Verification Programs

Third-party verification programs are another private mechanism that could drive compliance with the WPS. Third-party verification programs engage multiple stakeholders across the supply chain to ensure that the products receiving certification adhere to a specific set of standards.⁴¹¹ Many third-party verification systems are multi-stakeholder initiatives (MSIs). MSIs are organizations that connect corporations with civil society to evaluate a central issue—usually related to human and environmental rights—within corporate strategy.⁴¹² MSIs recognize that the ability to address human rights issues is not always possible with singular governance mechanisms; it requires members of various interest groups, including corporations, investors, nonprofits, consumers, and, ideally, workers. MSIs are often considered a moderate alternative to the polarization between mandatory government regulation schemes and independent (or voluntary) corporate regulation.⁴¹³ Growers may choose to participate in third-party verification programs to appeal to consumers and institutions interested in purchasing products with more stringent, socially conscious supply chain standards.

Third-party verification programs can incentivize better labor practices by elevating standards and shedding light on supply-chain actors; the resulting market incentives (i.e., consumer demand, marketing opportunities) encourage participating employers to verify that they provide a safe and healthy work environment. Program standards that target pesticide practices can move growers toward compliance with the WPS.



Third-Party Verification Examples

The Equitable Food Initiative (EFI) is a multi-stakeholder third-party verification program aiming to improve farmworkers' working conditions and ensure food safety in the produce industry by working closely with farmworkers, employers, and retailers to establish and verify standards that promote a safe and healthy work environment.⁴¹⁴ EFI-certified farming operations meet the EFI Pest Management Standards, which require workers to verify compliance with the WPS training requirements.⁴¹⁵ EFI creates and trains a Leadership Team of nine to 20 people on every EFI-certified farm to help the farm meet and maintain the EFI standards.⁴¹⁶ The Leadership Team includes workers and intentionally reflects the workforce's demographics, assuring workers' input and participation in identifying and addressing problems that arise on the farm related to worker health and safety.⁴¹⁷ EFI labels all certified fruits and vegetables with its "Responsibly Grown, Farmworker Assured" label to signal to the consumer that the product complies with the program.⁴¹⁸

Other third-party certification programs that include standards related to worker health, safety, and welfare include the GlobalG.A.P. certification⁴¹⁹ and the Agricultural Justice Project's Food Justice Certification.⁴²⁰

While third-party verification programs and MSIs have the potential to foster WPS compliance through increased transparency about worker health and safety standards on participating farms, the programs are only as effective as their accountability mechanisms. Some critics of third-party verification programs and MSIs highlight that corporations often center themselves in the governance structure by dominating the program design and decision-making processes to ensure that the MSI prioritizes their objectives, which poses challenges with accountability.⁴²¹ Additionally, unlike the WSR model, there is no supply-chain agreement under which a grower could lose access to major buyers; the penalty is typically just losing the certification. MSIs also do not (typically) offer an easy enforcement mechanism for workers to counterbalance the threat of retaliation for reporting. For certifications to be a meaningful tool for promoting worker well-being, farmworker participation in the certification process, like in the EFI program, plus rigorous inspections and standards reviews, are necessary to ensure worker health and safety are a priority. Structuring governance structures to put workers and worker advocates in the majority of any governing bodies or decision-making groups or entrusting them with veto power can also promote legitimacy.



Legal Aid Organizations

Legal aid organizations also play a critical role in protecting worker health and safety. In addition to representing individual clients in administrative and judicial proceedings, legal aid organizations frequently conduct “know your rights” education, outreach, and legal counseling that helps workers better understand their legal protections and their employer’s obligations. Through outreach, inquiries, and the client intake process, legal service providers gain insight into employer practices in each region, often learning of bad practices and abuses occurring at a worksite, in a region, or in production of a particular crop. As they help workers enforce their rights, service providers can build relationships with government regulators and inspection officers that make these service providers advisors to and extensions of those enforcement bodies, helping steer government scrutiny to problematic worksites.

Many legal aid organizations have dedicated farmworker units, devoting staff and resources to developing expertise to the issues facing farmworkers in their region. These units can assist workers in filing complaints about pesticide safety violations, conduct oversight on the quality and extent of enforcement, intervene in appeals of citations, and represent workers in retaliation claims and sometimes in personal injury claims against pesticide application companies. Some organizations even have established formal agreements or memoranda of understanding with enforcement agencies to help streamline the reporting and referral of other types of health and safety violations.⁴⁰⁷

Legal aid organizations face limitations, however, that inhibit their ability to provide extensive oversight. Legal services are sparser in rural areas, creating “legal deserts” in many of the regions where farmworkers live and work.⁴⁰⁸ Additionally, many legal aid programs receive funding from the Legal Services Corporation (LSC, a publicly funded, Congressionally established nonprofit), which restricts their ability to directly represent undocumented individuals, represent groups in class actions, or engage in labor organizing activities.⁴⁰⁹ Complicating this representation further, lawyers must counsel their clients according to the client’s best interest. Reporting pesticide violations holds no promise of monetary damages⁴¹⁰ or, in many states, assurance of confidentiality that might balance the risk to a worker of employer retaliation, a fact which an attorney will share with their client and may decrease the worker’s interest in reporting. Thus, service providers may learn of violations that do not get communicated to enforcement authorities and therefore go unaddressed. Amending FIFRA to include a private right of action for WPS violations, with civil penalties recoverable by workers, could better deputize legal service providers to augment under-resourced enforcement agencies in protecting workers.

Organics

Many mistakenly believe that organic growers have no responsibilities under the WPS. However, certain registered pesticides (including both synthetic and naturally derived substances) may be used in organic farming.⁴²² For example, lime sulfur solution may be used in organic agriculture and can be highly toxic.⁴²³ Sulfur, which is commonly used as a pest-control substance on both conventional and certified-organic farms, is known to cause irritant dermatitis and respiratory and eye irritation.⁴²⁴ “Organic,” therefore, does not necessarily mean pesticide-free, and the WPS applies to any organic agricultural operation that uses registered pesticides bearing the WPS label.⁴²⁵ Further, the USDA organic certification does not include any separate requirements with respect to worker protections,⁴²⁶ so WPS compliance remains critical.

Although it is not pesticide-free, organic agriculture can help protect farmers and farmworkers by eliminating exposure to most toxic synthetic pesticides.⁴²⁷ Farmworkers at organic agricultural establishments have been found to have lower concentrations of insecticide and fungicide metabolites in urine—an indicator of harmful pesticide exposure—compared to those working on conventional agricultural establishments.⁴²⁸ The National Organic Program’s (NOP) focus on promoting on-farm ecological balance by relying on mechanical, biological, and cultural practices rather than chemical applications can help reduce farmworkers’ exposure to harmful pesticides.⁴²⁹ Every certified-organic agricultural operation is required to develop an organic system plan (OSP), which specifies how farmers will control pests of concern, and submit it for approval to a third-party certifier.⁴³⁰ Thus, third-party certifiers can support the health and safety of farmworkers by emphasizing that pesticides should be considered only as a last resort and by ensuring that an OSP’s requirements remain rigorous and that the plan prioritizes techniques that promote ecological balance.

Encouraging growers to transition to organic agriculture is a worthwhile strategy for mitigating the harm from the most toxic pesticides. Organic transitions can also mitigate concerns regarding pesticide drift from conventional operations onto organic operations. The process to become certified organic, however, can be lengthy, expensive, and challenging for growers to undertake. The transition takes a minimum of three years to complete,⁴³¹ during which time the agricultural establishment seeking certification must manage its operation under the NOP and without the use of any prohibited inputs.⁴³² During the transition, farmers must keep extensive records documenting all land use and material applications throughout the transitional period.⁴³³ They must also maintain compliance with organic growing requirements but cannot yet realize the additional revenue gained from marketing their agricultural products as organic.⁴³⁴ Obstacles like the certification costs, pest management, additional labor costs, availability of organic processing and distribution facilities, and recordkeeping requirements, among others, can act as deterrents to the transition.⁴³⁵

To mitigate these deterrents, several programs are available to support conventional agricultural operations interested in transitioning to organic production. The USDA’s Organic Transition Initiative (OTI), created in 2022, is one such program intended to deliver “wrap-around technical assistance.”⁴³⁶ The OTI provides farmer-to-farmer mentoring, direct financial support and additional crop insurance assistance, and support for targeted market development projects.⁴³⁷ USDA also offers financial support to transitioning farms through the Organic Certification Cost Share Program and the Organic and Transitional Education and Certification Program, both of which provide funding to obtain or renew organic certification.⁴³⁸ States may also complement the national programs with their own initiatives, such as **California’s** \$5 million investment into supporting organic transitions in the state’s 2022–23 state budget.⁴³⁹

Recommendations

To enhance worker safety from pesticide exposure and harm on farms, policymakers should:

- Amend the regulation governing organic system plans (7 C.F.R. § 205.201) to require growers to identify products that trigger WPS requirements and certify their understanding of their obligations under the WPS.
- Increase the EPA’s outreach to organic growers, through collaboration with USDA, to ensure that organic growers are aware and informed of their responsibilities to comply with the WPS.
- Continue and increase funding for USDA’s Organic Transition Initiative and cost-share programs to encourage organic transitions, while encouraging and promoting sound labor practices on organic farms. The programs are important for reversing the recent trend of fewer non-certified organic farms actively transitioning to organic production.



USDA Photo by David Kostling.



David Bacon

RECOMMENDATIONS

THIS FINAL SECTION SUMMARIZES THE RECOMMENDATIONS FEATURED THROUGHOUT THIS REPORT AND IDENTIFIES ADDITIONAL RECOMMENDATIONS TO PROMOTE COMPLIANCE WITH THE WPS AND IMPROVE ITS EFFICACY.

For full background and accompanying citations, please refer to the corresponding section.

Overarching Recommendations

- Commission the development and inclusion of additional pesticide-related questions in the NAWS to provide a better understanding of WPS compliance and implementation on the ground.
- For EPA administration of cooperative agreements:
 - Incorporate stakeholders in the development of requests for applications and more precisely specify priority activities, deliverables, and processes for applicants.
 - Consider administering smaller-scale cooperative agreements so that grantees can focus attention and energy on a narrower set of activities.
 - Collaborate with recipient organizations to develop a public-facing work plan that is published on the EPA’s website and updated with progress reporting at regular intervals.
 - Encourage partnerships that bring a range of expertise to projects, ensuring that community-based organizations play a significant or lead role in steering projects that aim to benefit farmworker communities.

- Support research examining the efficacy of compliance monitoring activities conducted by bilingual and monolingual (English-speaking) inspectors.
- Support the education, training, and recruitment of bilingual inspectors and move toward making language skills a job requirement.
- Engage in a national campaign, tailored to each region, to raise awareness of these obligations and their importance. The EPA could collaborate with the USDA, land grant universities, and cooperative extension to extend the campaign's reach.
- Evaluate the WPS, overall, and its individual components for protecting and promoting farmworker health and safety. Fund farmworker organizations to steer this work and ensure that the evaluation incorporates farmworkers in a meaningful, participatory way.
- Amend FIFRA to include a private right of action for WPS violations, with civil penalties recoverable by the workers put at risk.

Training for Employees

- Involve farmworkers, farmworker organizations, and WPS trainers in EPA-funded projects that design, develop, review, and evaluate WPS training materials.
- Incorporate evidence-based approaches to design and evaluate effective training.
- Encourage or require that farmworker training be provided in an appropriate and engaging format and that it be culturally and geographically relevant.
- Encourage or require refresher training for non-certified trainers.
- Encourage or require certified applicators to be educated in effective training methodologies.
- Encourage or require that workers receive refresher trainings (i.e., tail-gate trainings) on pesticide safety regularly.
- Work on developing best practices in partnership with farmworkers and grassroots organizations to improve upon industry and regulatory standards in the future.
- Consider incentives that encourage employers to meet their obligations by allowing nonprofit and grassroots organizations to provide training, with sufficient, dedicated paid work time.

Access to Information

- Encourage or require that the central display information include the application area in picture format, such as a map of applications with landmarks and illustrations of safety guidelines that are more accessible to a diverse workforce.
- Conduct surveys or focus groups with farmworkers to gather input on the most effective way to communicate safety information and collaborate with community-based organizations to ensure accessibility and cultural relevancy of safety materials.
- Encourage or require pesticide safety information to be posted at additional locations, such as water stations, bathrooms, worker transportation, and worker housing.
- Encourage or require pesticide application information to be conveyed in the languages understood by workers at that operation.
- Provide safety and application information in several languages in pocket-sized cards and a mobile-friendly format so workers with mobile access can carry it with them.
- Encourage or require growers to permit use of mobile phones for information retrieval at the worksite and allow worker use of grower Wi-Fi networks where available to enable access.
- Expand the PRIA 5 bilingual pesticide labeling requirement to include directions for use.
- Expand the PRIA 5 bilingual pesticide labeling requirement to include languages in addition to Spanish.
- Encourage or require growers to post the bilingual pesticide information and/or QR code along with the application information in a central location and various worksite locations where workers are present.
- Encourage or require that the central display information reminds the worker that they have access to the record for two years and provides information on how to request it.

Entry Restrictions

- In the near term, finalize the 2023 AEZ proposed rule, putting to rest any lingering confusion regarding the applicability of the 2015 Rule's provisions.
- Longer term, increase the AEZ radius and lengthen its application window as a precautionary and more protective approach.
- Ensure that farmworkers' housing facilities provide adequate protection against pesticide drift infiltration.
- Establish buffer zones around farmworker housing where pesticides may not be sprayed. Require employers to provide alternative housing or accommodations if a buffer zone cannot be maintained.

- Encourage or require advance notification of farmworker housing residents so that workers can take precautions and/or leave temporarily.
- Encourage or require posting of warning signs along the path of an AEZ that extends into public thoroughways beyond the establishment.
- Require REI warning signs to include the date and time at which the relevant entry restriction commences and ceases.
- Require REI warning signs to include the name of the pesticide and product involved in the application.
- Encourage or require warning signs for applications with an REI greater than 24 hours.
- Encourage or require employers to document the method, location, date, and time that warnings were communicated to workers.
- Rescind the “agricultural emergency” and other early reentry exceptions to the REI requirements and review alternative means for agricultural establishments to recover losses from “agricultural emergencies” through insurance or indemnification rather than putting workers in jeopardy.
- Fund research, or commission an additional unit in the NAWS, to better document the incidence and cause of REI violations and current use of the REI exceptions.

Personal Protective Equipment

- Encourage or require certification from the worker that their employer has provided them with properly fitting PPE and/or the worker has access to the employer-provided PPE they need at the facility.
- Encourage or require employers to make gloves and clothing storage and changing areas available to all workers.
- Provide regular grant funding for agricultural producers to purchase PPE for employees, along with outreach and education and technical assistance for PPE provision.
- Support research to develop effective auxiliary cooling system PPE, such as cooling garments, made from lighter materials that workers can wear comfortably in the heat without risking heat illness.
- Support research to examine the distinct PPE needs of women and minors.

Decontamination Supplies

- Provide grant funding through the USDA to support development and implementation of carriers or devices that can better mobilize decontamination supplies, water and cups, and temperature-controlled food storage through the fields.
- Ensure that WPS training adequately and sensitively provides education concerning the importance of washing behaviors to reduce pesticide exposure, in a manner that respects the presently held beliefs of some workers concerning bodily health and safety.
- Guarantee workers compensated at a piece-rate wage receive at least the applicable minimum wage for all hours at work.
- Require workers to be compensated for breaks and non-productive time (e.g., washing, donning and doffing PPE) separate from their piece-rate compensation.

Emergency Assistance

- Provide employers with pocket-sized cards that list pesticide illness/poisoning symptoms and supervisor and emergency medical services information for workers to carry with them (and present when receiving medical care).
- Train employers and supervisors to recognize pesticide exposure symptoms.
- Encourage or require employers to have and regularly test an emergency plan or an injury and illness prevention plan that details what to do in the event of a suspected pesticide exposure, including whom to call and how to transport employees to medical facilities.
- Require health centers that receive federal funding to maintain and provide information and resources concerning pesticide exposure, including risk mitigation, exposure and symptom recognition, rights and protections, treatment, and health risks.
- Expand resources for mobile health clinics so they are equipped to serve the diverse farmworker community.
- Encourage or require employers to provide workers' compensation or compensate workers for time spent seeking medical attention and for recovery time for pesticide illness or injury.
- Provide grant funding and resources to support provider training on identifying and treating pesticide illness/poisoning and research that would help providers more quickly and accurately diagnose and treat patients.

Shaping the Compliance Landscape

- Expand workers' compensation coverage for agricultural workers in all states.
- Amend FIFRA to provide stronger retaliation protections for workers (e.g., reinstatement, back pay, other damages).
- Establish confidentiality protections for workers reporting WPS violations.
- Amend the H-2A regulations to specifically refer to the WPS and its general provisions as program requirements that must be disclosed in the work contract.
- Amend the H-2A regulations to require additional disclosures and training regarding workers' rights and protections broadly, including the WPS.
- Amend the H-2A regulations to reduce isolation of workers by assuring that workers are allowed to have visitors at their housing locations, even if visits have to be limited to outdoor areas during a pandemic.
- Establish exit-interview procedures with H-2A workers that include inquiry into a grower's practices regarding pesticides and compliance with the WPS, with guaranteed confidentiality.
- Increase coordination and shared authorities among state inspection officials charged with enforcing laws related to workers on agricultural establishments (e.g., H-2A housing inspections and WPS compliance).
- Encourage grower participation in WSR programs through incentives, procurement preferences, and education about the benefits these programs offer to workers and growers.
- Establish a federal floor protecting farmworker labor organizing that permits state law to go further and that does not preclude entry into or enforcement of supply chain agreements.
- Amend the regulation governing organic system plans to require growers to identify products that trigger WPS requirements and certify their understanding of their obligations under the WPS.
- Increase the EPA's outreach to organic growers, through collaboration with USDA, to ensure that organic growers are aware and informed of their responsibilities to comply with the WPS.
- Continue and increase funding for USDA's Organic Transition Initiative and cost-share programs to encourage organic transitions, while encouraging and promoting sound labor practices on organic farms.



USDA Photo by Lance Cheung

CONCLUSION

While the WPS has evolved and improved to better protect workers from pesticide exposure and the associated health impacts, those improvements can only be realized if growers understand their obligations and comply with its requirements. The regulation, the statute, and EPA guidance could also go much further to mitigate risks and empower workers to secure their personal safety at work. This report outlines findings and recommendations to improve upon the status quo, many of which have been identified and called for by workers and advocates through various avenues. The EPA must ensure that those calls to action are addressed meaningfully and that its engagement with the community is not just a sounding board but instead results in action.

Endnotes

- 1 SARAH GOLDMAN ET AL., *ESSENTIAL & IN CRISIS: A REVIEW OF THE PUBLIC HEALTH THREATS FACING FARMWORKERS IN THE U.S.* 34–37 (2021), https://clf.jhsph.edu/sites/default/files/2021-05/essential-and-in_crisis-a-re-view-of-the-public-health-threats-facing-farmworkers-in-the-us.pdf (acute conditions include nausea, dizziness, headaches, and fatigue, among others; chronic conditions include cancer, neurological effects, and DNA damage, among others).
- 2 See *Organophosphate Pesticides in the United States*, EARTHJUSTICE (Aug. 4, 2021), <https://earthjustice.org/feature/organophosphate-pesticides-united-states>; U.S. ENV'T PROT. AGENCY, *RECOGNITION & MANAGEMENT OF PESTICIDE POISONINGS*, ch. 5 “Organophosphate Insecticides” (2013), https://www.epa.gov/sites/default/files/documents/rmpp_6thed_ch5_organophosphates.pdf (listing “highly toxic” and “moderately toxic” commercial organophosphates). The EPA’s recent (2021) interim registration review decision on Paraquat Dichloride (“paraquat”) drew objection and litigation from farmworker advocates who argue that the EPA did not properly consider paraquat’s harmful effects on farmworkers and neighboring communities in its review. See Petitioner’s Opening Brief, *California Rural Legal Assistance Foundation, v. U.S. Env’t Prot. Agency*, No. 21-71287 (9th Cir. Sept. 24, 2021).
- 3 OLIVIA N. GUARNA, *EXPOSED & AT RISK: OPPORTUNITIES TO STRENGTHEN ENFORCEMENT OF PESTICIDE REGULATIONS FOR FARMWORKER SAFETY* (2022), <https://www.vermontlaw.edu/sites/default/files/2022-09/Exposed-and-At-Risk.pdf>.
- 4 LAURIE J. BEYRANEVAND, *ESSENTIALLY UNPROTECTED: A FOCUS ON FARMWORKER HEALTH LAWS & POLICIES ADDRESSING PESTICIDE EXPOSURE & HEAT-RELATED ILLNESS* 14–17 (2021), <https://www.vermontlaw.edu/sites/default/files/2021-04/Essentially-Unprotected-FINAL.pdf>; see also GUARNA, *supra* note 3, at 9–11.
- 5 Under FIFRA, “State” is defined to include the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, the Trust Territory of the Pacific Islands, and American Samoa. The EPA can also support Tribal pesticide programs through cooperative agreements. See *Guidance: Funding Development and Administration of Tribal Pesticide Field Program and Enforcement Cooperative Agreements*, U.S. ENV’T PROT. AGENCY, <https://www.epa.gov/compliance/guidance-funding-development-and-administration-tribal-pesticide-field-program-and> (page last updated Feb. 14, 2023; guidance updated Jan. 2011).
- 6 See *Organized Migrants in Community Action, Inc. v. Brennan*, 520 F.2d 1161 (D.C. Cir. 1975). For a more detailed discussion of this issue see LAURIE J. BEYRANEVAND, *ESSENTIAL BUT EXPENDABLE: THE FAILURE OF PREEMPTIVE AGENCY SPACE TO PROTECT FARMWORKERS FROM DANGEROUS PESTICIDES* (forthcoming as of Sept. 2023).
- 7 40 C.F.R. §§ 170.303, 170.305.
- 8 Pesticides; Agricultural Worker Protection Standard Revisions, 80 Fed. Reg. 67495, 67498 (Nov. 2, 2015) (to be codified at 40 C.F.R. pt. 170), <https://www.federalregister.gov/documents/2015/11/02/2015-25970/pesticides-agricultural-worker-protection-standard-revisions> [hereinafter “2015 Rule”].
- 9 See also BEYRANEVAND, *supra* note 4, at 16.
- 10 2015 Rule, 80 Fed. Reg. 67495, 67498.
- 11 See Pesticides; Agricultural Worker Protection Standard; Reconsideration of the Application Exclusion Zone Amendments, 88 Fed. Reg. 15346 (proposed Mar. 13, 2023; to be codified at 40 C.F.R. pt. 170), <https://www.federalregister.gov/documents/2023/03/13/2023-03619/pesticides-agricultural-worker-protection-standard-reconsideration-of-the-application-exclusion-zone> [hereinafter “2023 AEZ Proposed Rule”].
- 12 *Id.*
- 13 See *Farmworker Health Policy Database*, CTR. FOR AGRIC. & FOOD SYSTEMS, <https://www.vermontlaw.edu/academics/centers-and-programs/center-for-agriculture-and-food-systems/projects/food-system-worker/policy-database> (last visited Aug. 22, 2023).
- 14 See Cal. Dept. of Pesticide Reg., *A Guide to Pesticide Regulation in California, Ch. 8: Protecting Workers and the Public*, 64, 65 (2017), <https://www.cdpr.ca.gov/docs/pressrls/dprguide/chapter8.pdf> (last ac-

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- 15 OR. OSHA, OVERVIEW OF ADDITIONAL OREGON OSHA PROTECTIVE MEASURES (n.d.), <https://osha.oregon.gov/news/notices/Documents/wps-aez/WPS-Comparison-Chart-070218-R3.pdf>.
- 16 Worker Protection Standards for Agricultural Pesticides, 39 Fed. Reg. 16888 (May 10, 1974).
- 17 Worker Protection Standard, 57 Fed. Reg. 38102, 38103 (Aug. 21, 1992).
- 18 *Id.*; Intent to Form an Advisory Committee to Negotiate Proposed Farmworker Protection Standards for Agricultural Pesticides, 50 Fed. Reg. 38030 (1985).
- 19 Worker Protection Standards for Agricultural Pesticides, 53 Fed. Reg. 25970, 25972 (proposed rule; 1988).
- 20 *Id.*; see Daniel J. Fiorino, *Regulatory Negotiation as a Policy Process*, 48 PUB. ADMIN. REV. 764, 765 (1988); Philip J. Harter, *Assessing the Assessors: The Actual Performance of Negotiated Rulemaking*, 9 NYU ENV'T L.J. 32, 41 (2000). *But see* Cary Coglianese, *Assessing the Advocacy of Negotiated Rulemaking: A Response to Philip Harter*, 9 NYU ENV'T L.J. 386, 402 (2001) (pointing out that, for a long time, the EPA considered the WPS one of the agency's "negotiated rules").
- 21 Worker Protection Standard, 57 Fed. Reg. 38102, 38104 (Aug. 21, 1992).
- 22 *Id.* at 38104–05.
- 23 An Act to Extend Certain Compliance Dates for Pesticide Safety Training and Labeling Requirements, Pub. L. No. 103-231, 108 Stat. 333 (1994).
- 24 2015 Rule, 80 Fed. Reg. 67495, 67498.
- 25 2023 AEZ Proposed Rule, 88 Fed. Reg. 15346.
- 26 *Pesticide Dashboard Help*, U.S. ENV'T PROT. AGENCY, <https://echo.epa.gov/help/pesticide-dashboard-help> (last visited Sept. 22, 2023); *Analyze Trends: EPA/State Pesticide Dashboard*, U.S. ENV'T PROT. AGENCY, <https://echo.epa.gov/trends/comparative-maps-dashboards/state-pest-dashboard> (last updated Dec. 8, 2022).
- 27 *Analyze Trends: EPA/State Pesticide Dashboard*, *supra* note 26.
- 28 *Id.*
- 29 GUARNA, *supra* note 3, at 26.
- 30 *EPA Posts Pesticide Incident Data Publicly*, U.S. ENV'T PROT. AGENCY (July 27, 2023), <https://www.epa.gov/newsreleases/epa-posts-pesticide-incident-data-publicly>.
- 31 OFF. OF ENFORCEMENT & COMPLIANCE ASSURANCE U.S. ENV'T PROT. AGENCY, COMPLIANCE MONITORING STRATEGY FOR FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT (FIFRA) (2015), <https://www.epa.gov/sites/default/files/2015-09/documents/fifra-cms.pdf> [hereinafter "FIFRA COMPLIANCE MONITORING STRATEGY"].
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