



# Resilient crops require a resilient workforce

Investing in occupational  
heat stress solutions

Presented by

Jason@laislanetwork





# A Global Research & Advisory NGO

- » Conducting data-driven research on OSH interventions under the belief **that all occupationally related illness, injury and early mortality is preventable**
- » Collaborating with global research institutions.
- » Providing advisories in OSH through a transdisciplinary approach.
- » Providing evidence-based legal and policy frameworks to businesses, workers and governments.
- » Offices in USA, EU and Costa Rica and global network



# Our Partners for Change



Sainsbury's

Turner

DIAGEO

Coca-Cola



Grupo EL ÁNGEL



EST. 1890

ISA | INGENIO  
SAN ANTONIO



Pantaleon



Liberty  
Insurance.



Calibre

## 20+ Country Presence





A shirtless man wearing a cap and dark pants is working in a sugarcane field. He is surrounded by tall, yellowish-brown sugarcane stalks. The ground is dark and appears to be soil or ash. The man is looking down and working with the stalks. The text "His workday is up to 12 hours" is overlaid on the image in white, bold font.

**His workday  
is up to 12 hours**



# Heat Stress

AKI: Acute Kidney Injury  
CKD: Chronic Kidney Disease

Environmental heat



Internal heat from muscular work



- Greater physical strain
- Hotter internal body temperature

Increased risk of:

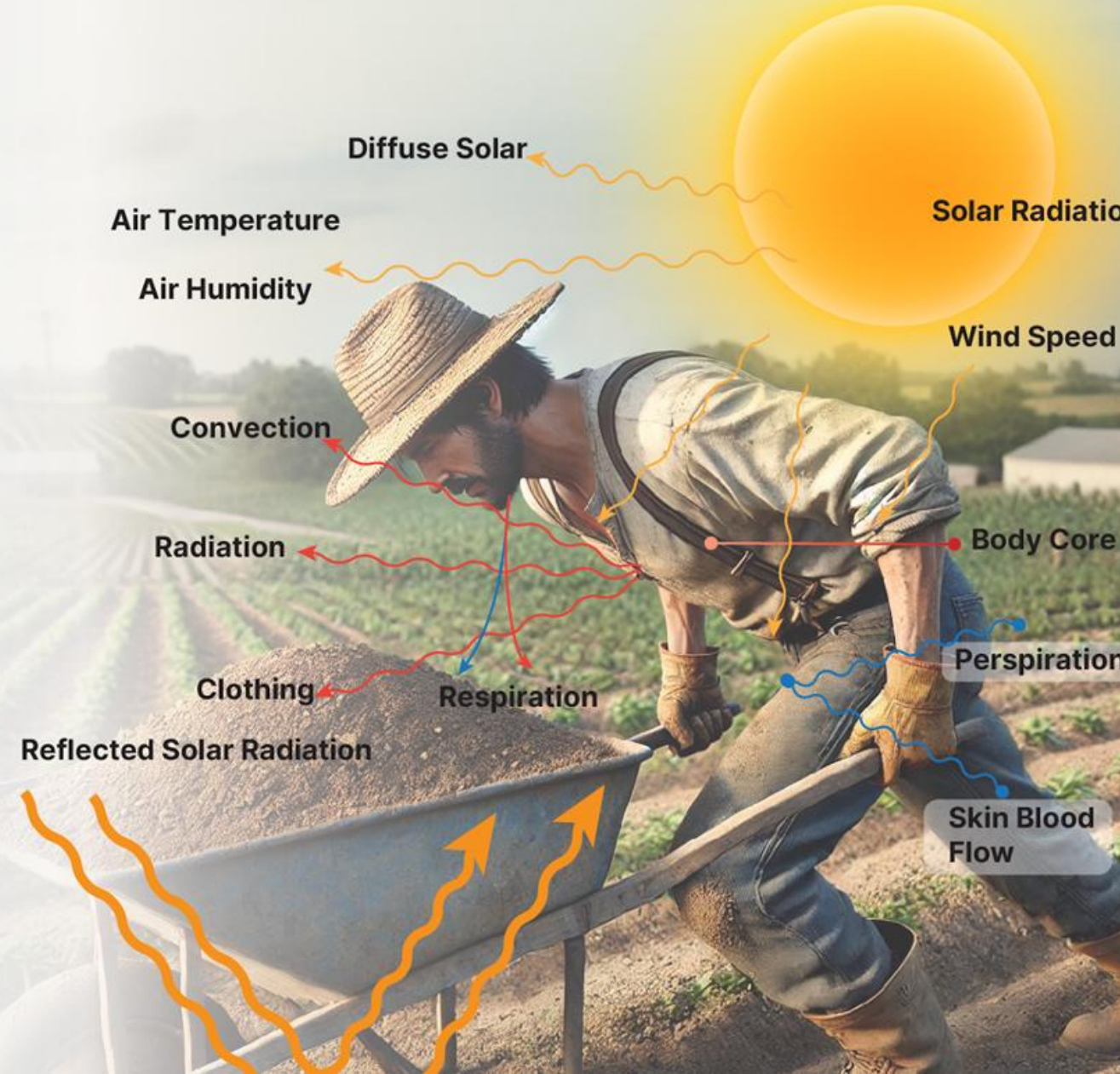


- » Heat stroke
- » AKI and CKD
- » Accidents

Reduced productivity

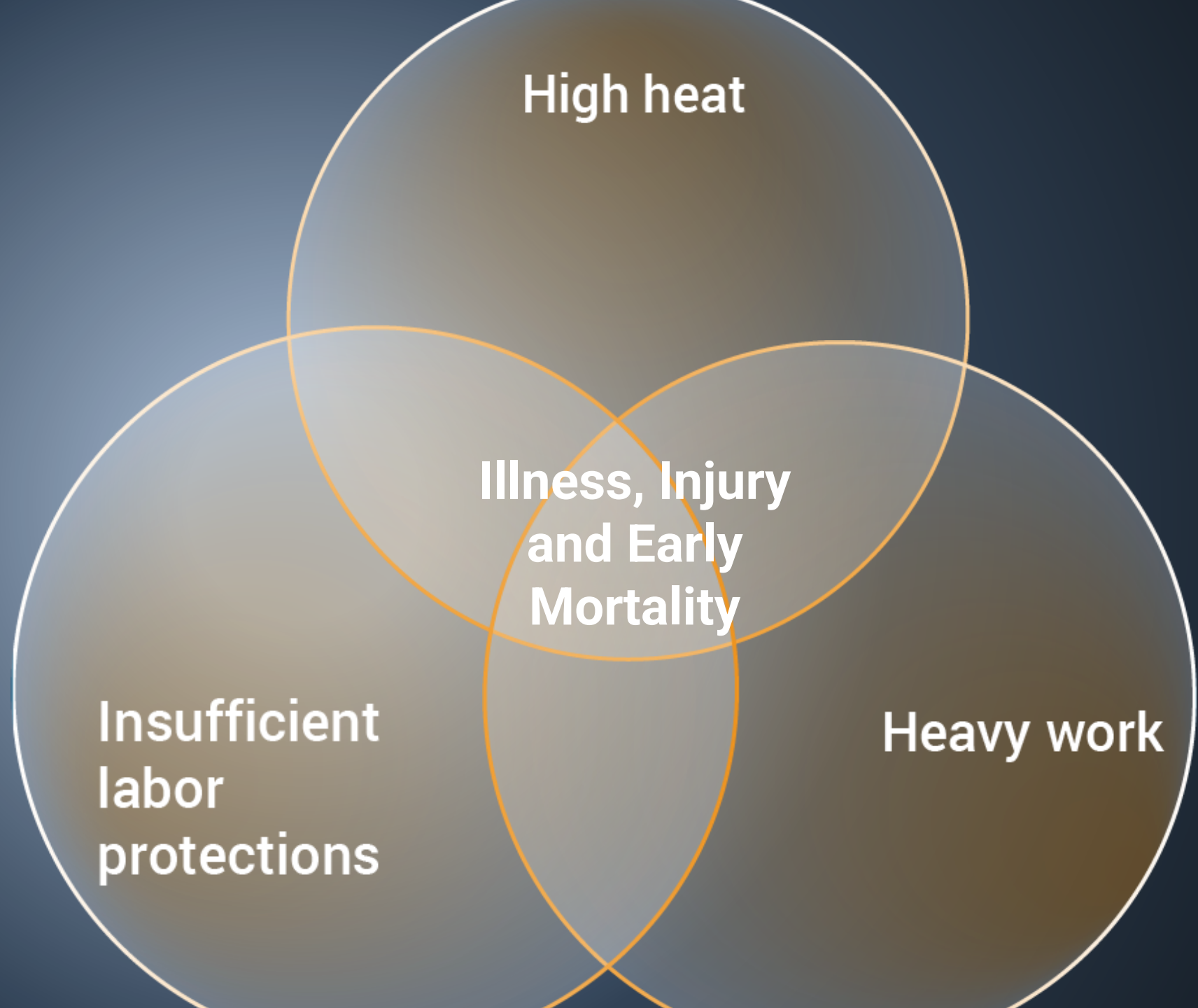


Early mortality



# Drivers

Strenuous work in hot environments without adequate protections is a key risk factor for heat related illness, injury and early mortality in manual workers.





# Impact on development and society is multigenerational:

**22%** of worker households impacted by CKD in Chichigalpa Nicaragua had a child enter the workforce to replace a sick or deceased parent





# Our Adelante Initiative Highlighted in ILO Report

Adelante Initiative is one of six exemplary workplace programs addressing heat stress prevention and control across diverse global regions.

**Adelante**  
initiative



International  
Labour  
Organization

## ▶ The Adelante Initiative in Central America

The Adelante Initiative<sup>13</sup> was founded in 2017 to improve working conditions for sugarcane workers facing extreme heat and its consequences, including heatstroke and impaired kidney function. Ingenio San Antonio (a sugar plantation in Chichigalpa, Nicaragua), La Isla Network (a research and advocacy NGO), and Bonsucro (a sustainability certification platform) united to take action. The mechanics of the workplace heat stress prevention plan developed through the Adelante Initiative were conceptually simple:

1. Mandated breaks throughout the day across the entire year.
2. Mobile tents for accessible shaded rest during the mandated breaks.
3. Accessible purified water as well as isotonic solution made of purified water, electrolytes and carbohydrates.
4. Sanitation facilities in the field, to account for needs related to increased fluid intake.

Despite its conceptual simplicity, the heat stress prevention plan required innovative management and logistical solutions to function effectively on a 750 square kilometre (75,000 hectare) sugar plantation. To achieve this, Ingenio San Antonio and La Isla Network set a series of priorities (known as "the PREP methodology"):

- ▶ **Prevention:** Heat exposure and organizational systems are assessed, gaps addressed with employers and workers, and protocols implemented to prevent heat-related illnesses and accidents arising from excessive heat.
- ▶ **Resilience:** Measured through (1) the contribution of occupational interventions on the resilience of communities supplying the labour force, and (2) the impact that the reduction of incidence of heat-related illness has on the public health and social security systems.
- ▶ **Efficiency:** The use of physiological insights to ensure worker productivity is essential as employers are unlikely to adopt programmes that impair production targets.
- ▶ **Protection:** Careful assessment of excessive heat exposure and health outcome data informs impactful and achievable public and private sector policy recommendations to protect workers from heat-related illnesses.

In the first three years, the methodology reduced harm with a sharp decline (94 per cent) in cases of acute kidney injury arising from excessive heat, eliminated fatal incidences of heatstroke, increased productivity by 10-20 per cent and provided a 22 per cent positive return on investment as accidents, staff turnover and absenteeism were reduced.

The Adelante Initiative has emerged as a centre of excellence where sugar mills and other industries in the region learn to better protect their workforce, while researchers with La Isla Network assess new organizational and technical innovations.

## ▶ A group of sugar cane workers in Nicaragua.

Taking a mandated cooling break in a mobile tent as part of the heat stress prevention plan developed through the Adelante Initiative.



Photo credit: Ed Kashi/Redux. Permission required for reuse.



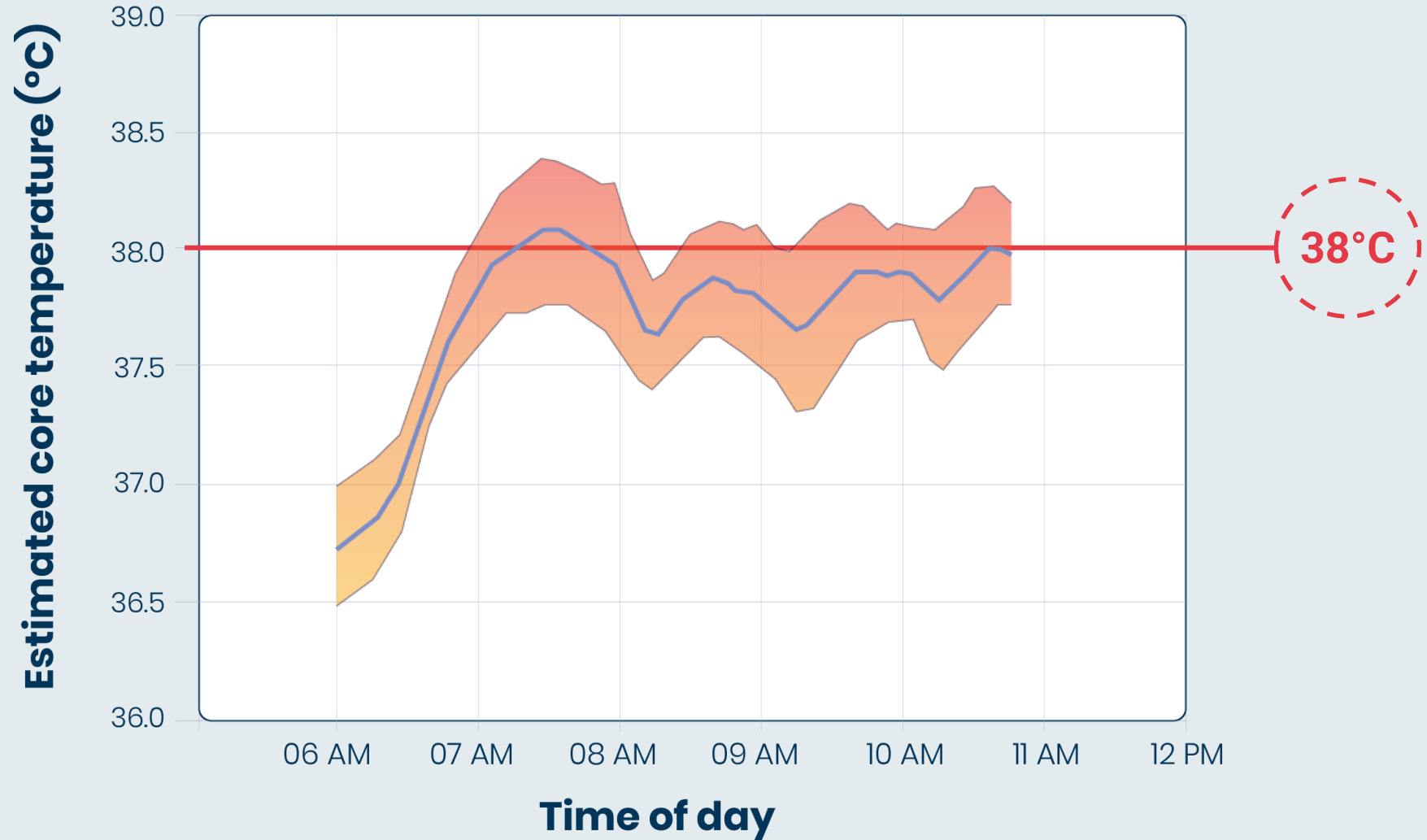
- Rest-shade-hydration-sanitation (RSH-S) intervention
- Improving heat stress prevention practices
- Improving organizational culture
- Evaluation of workplace intervention and impacts





# Those with highest core body temperatures have highest incidence of kidney injury, early mortality and reduced productivity

**Our key objective:**  
Reduce dangerously high core temps.

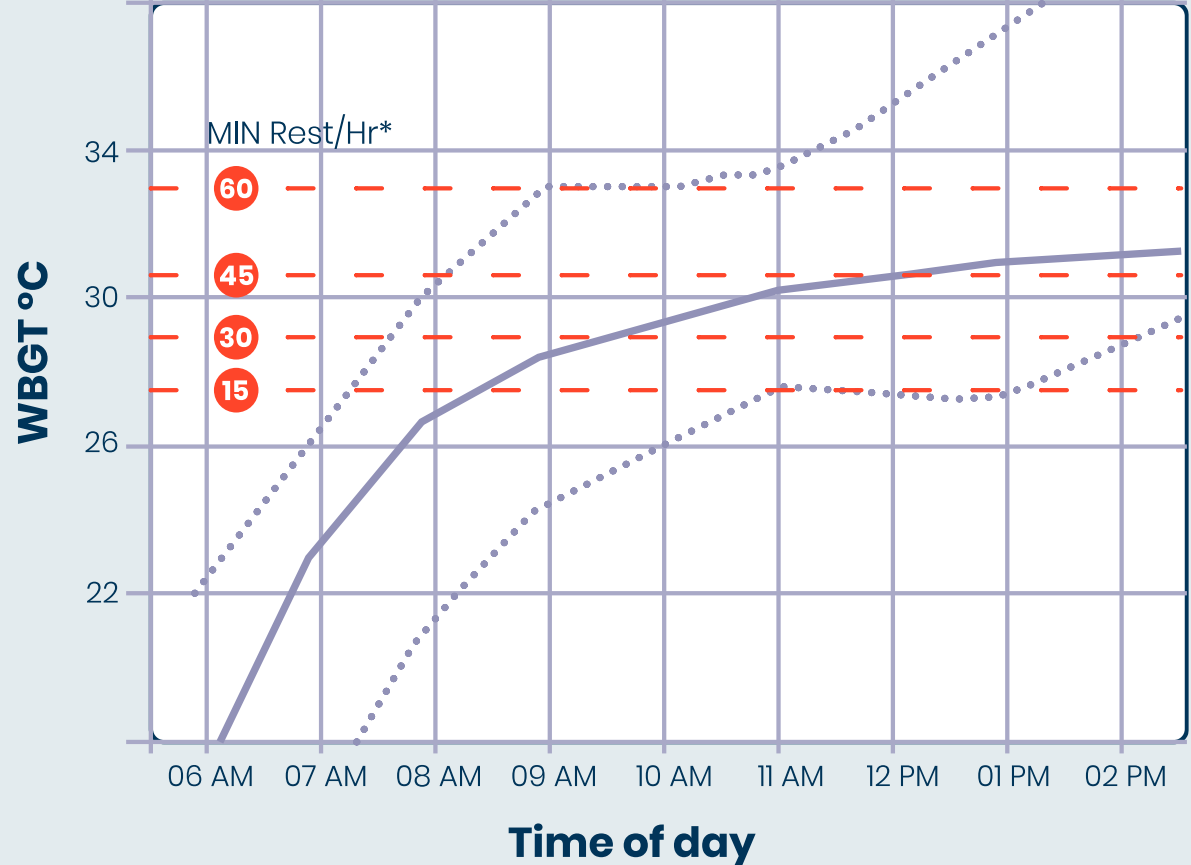




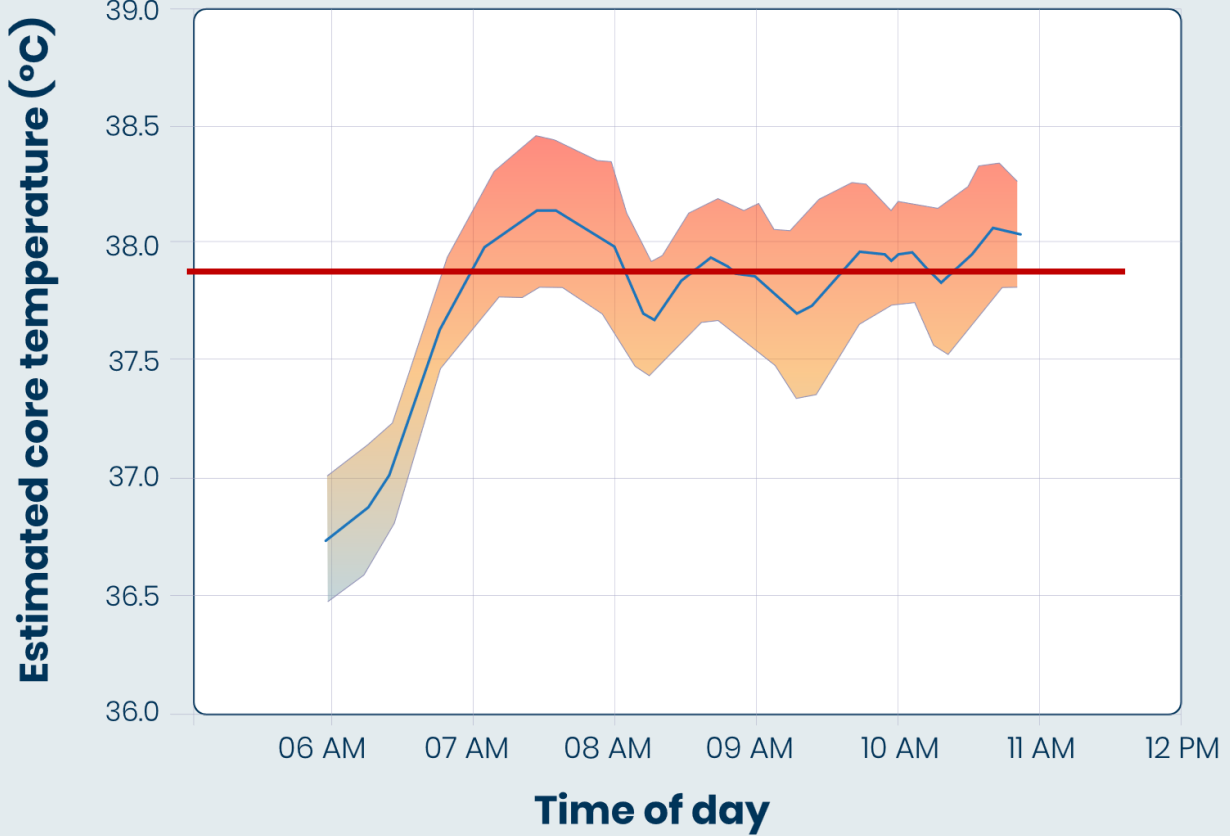
# Current guidance managed to be both over and under protective



### WBGT over a harvest in context of ACGIH Rest Guidelines for very heavy work



### Core temperature of burned cane cutters





# LIN had to design our W/R schedule based on core body temperature readings and long-term health & organizational findings

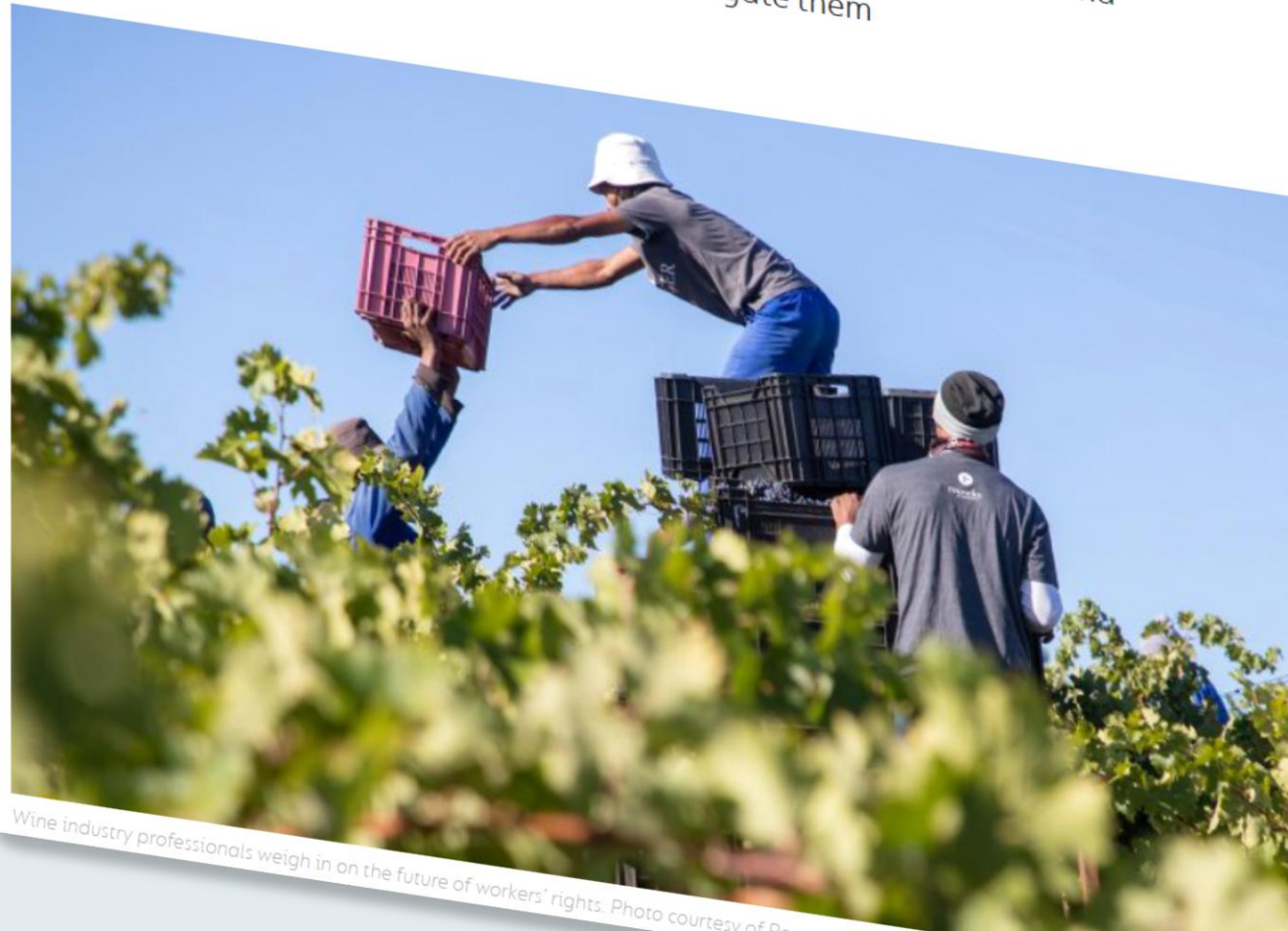


# A Key Factor to Consider



## The Wine Industry's Human Rights Challenge

It's time to scrutinize the significant labor issues facing the wine sector—and explore the preliminary steps being taken to mitigate them



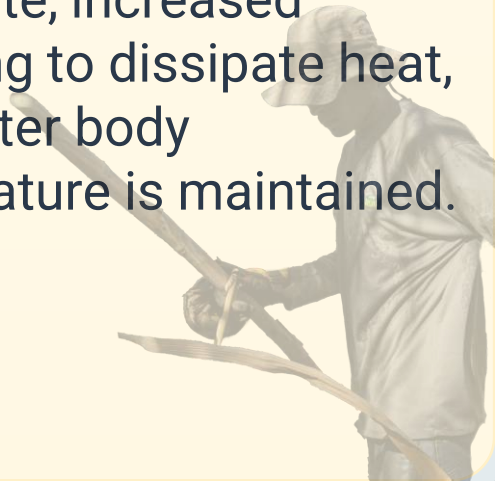
Wine industry professionals weigh in on the future of workers' rights. Photo courtesy of De



# A Key Factor to Consider



The workers' bodies adapt to achieve greater blood expansion, a decrease in HR at the same intensity and an increase in the sweat rate. Hormonal adaptations occur: lower heart rate, increased sweating to dissipate heat, and better body temperature is maintained.



During the first days of the harvest, it is recommended to establish an acclimatization period of 8 to 10 days. The working day of every worker who is going to start work is reduced and is gradually increased until the established maximum is reached. It also applies to workers who return to work after 15 days of absence.

A 4-day adaptation is also recommended when a worker has switched from a lower-load activity to a higher-load activity. It starts with a workload corresponding to 60% of the minimum established in the activity to which it is being changed and will increase to 70% on the second day, 85% on the third day and 100% on its fourth day.



The following table describes the acclimatization process according to the work activity.



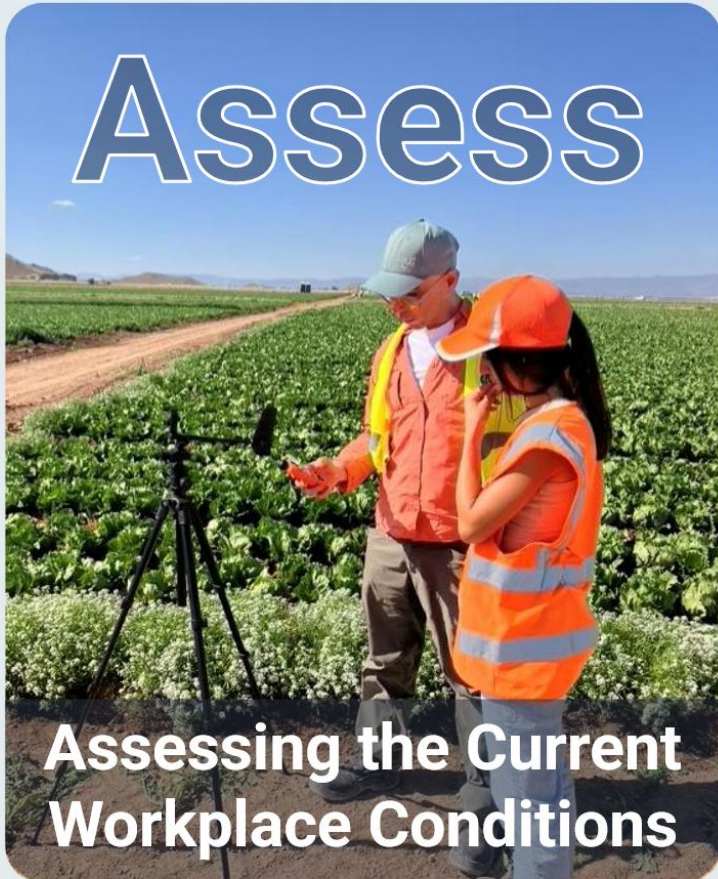
Activity	Task	1st Day	2nd Day	3rd Day	4th Day	5th Day	6th Day	7th Day	8th Day	9th Day
Manual Cane Cutting	5.2 tons	1.5 tons	2 tons	2.5 tons	3 tons	3.5 tons	4 tons	4.5 tons	5 tons	5.3 tons
Seed Cutting	140 bundles	60 bundles	70 bundles	80 bundles	90 bundles	100 bundles	110 bundles	125 bundles	140 bundles	
Replanting	16 sacks	8 sacks	9 sacks	10 sacks	11 sacks	12 sacks	13 sacks	14 sacks	16 sacks	
Replanting (Marking)	24 sacks	12 sacks	12 sacks	14 sacks	16 sacks	18 sacks	20 sacks	22 sacks	24 sacks	
Replanting (Semi-mechanized)	8 hours	10:00 AM	11:00 AM	11:00 AM	12:00 PM	12:00 PM	1:00 PM	1:00 PM	2:00 PM	
Planting (Irrigation - Covered)	9 sections	4 sections	5 sections	5 sections	6 sections	6 sections	7 sections	7 sections	8 sections	
Planting (Irrigation only)	12 furrows	5 furrows	6 furrows	6 furrows	7 furrows	8 furrows	9 furrows	11 furrows	12 furrows	
Drip Repair	8 hours	10:00 AM	10:00 AM	11:00 AM	11:00 AM	12:00 PM	12:00 PM	1:00 PM	2:00 PM	
Weeding	8 hours	10:00 AM	10:00 AM	11:00 AM	11:00 AM	12:00 PM	12:00 PM	1:00 PM	2:00 PM	



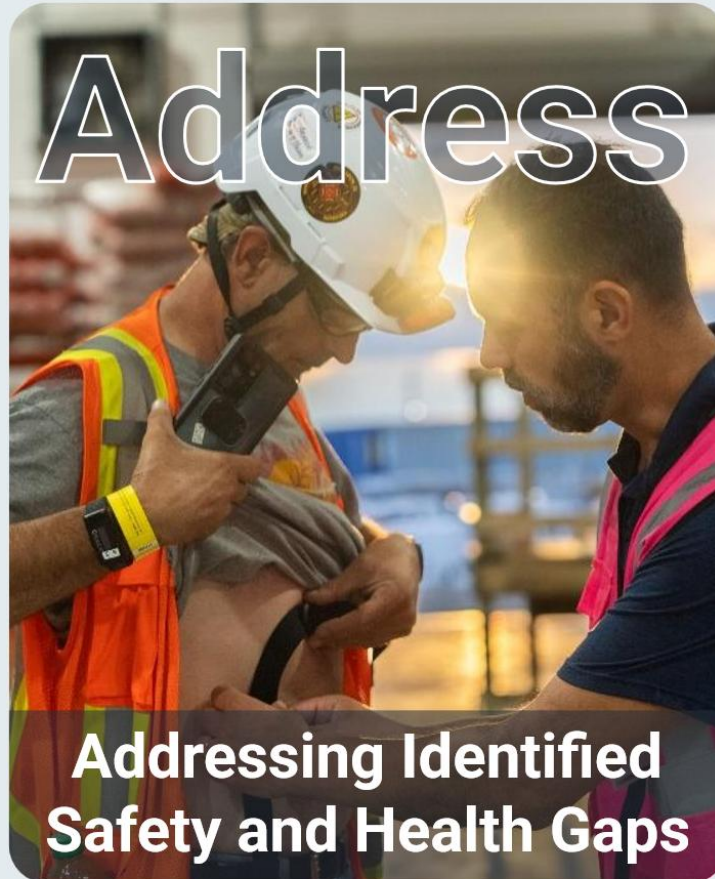
# Risk Mapping & Practical Interventions



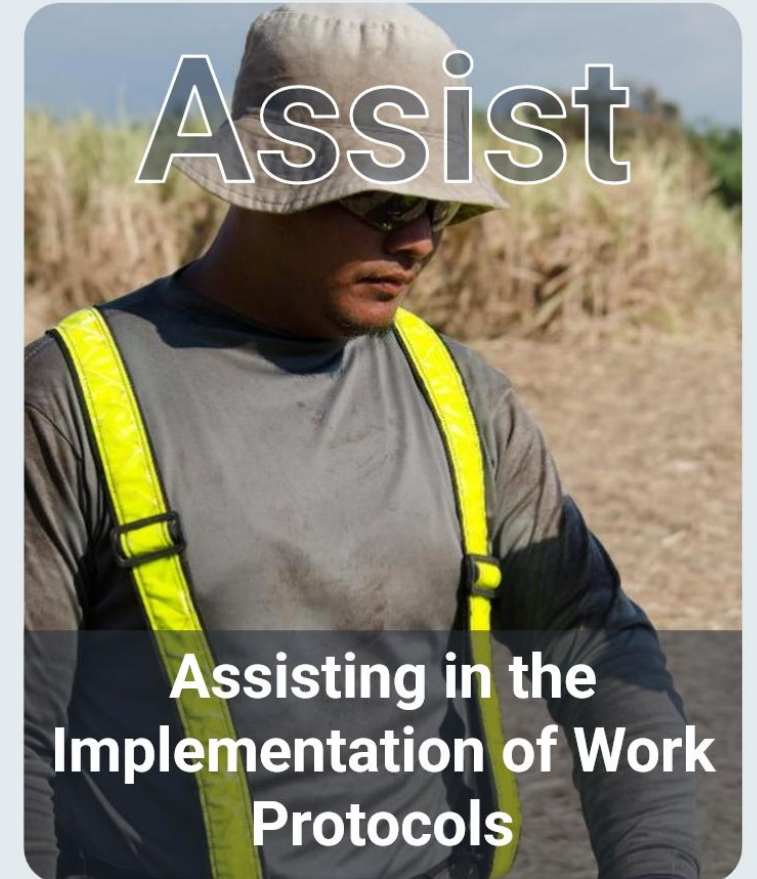
## Assess



## Address



## Assist





# Improving RSH+s

Rest | Shade | Hydration + Sanitation



Mandated Breaks



Portable shade tents



Clean water and electrolytes

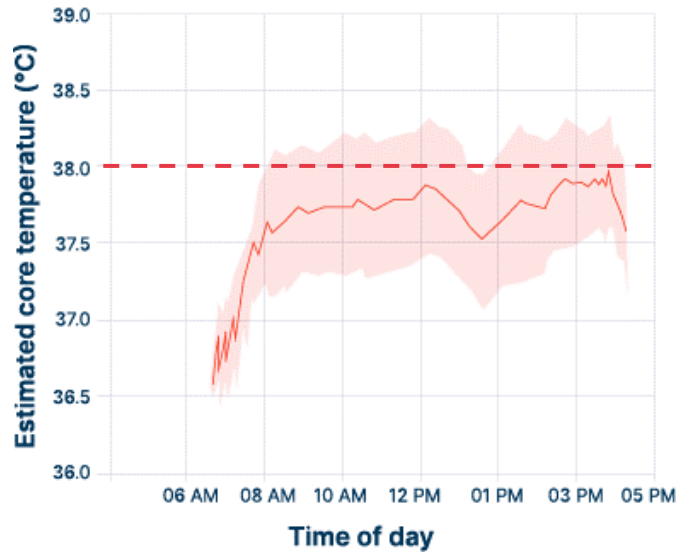


Importance of good hygiene



# Comparing Results for Break Frequency and impact on kidney injury over the harvest (IKI)

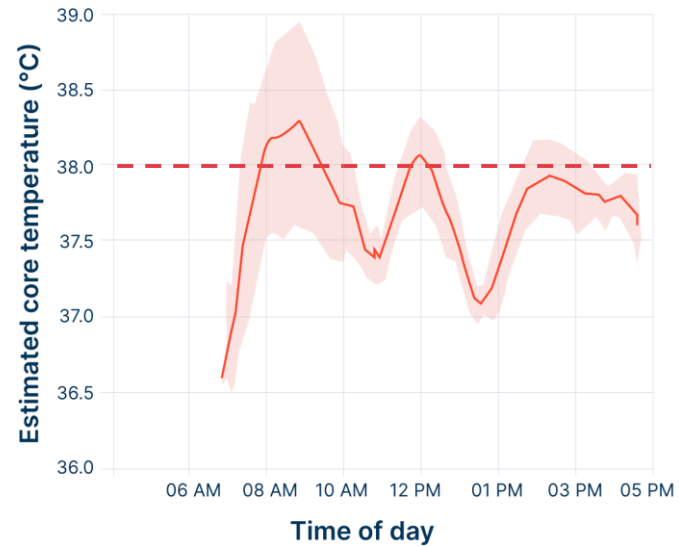
## No Intervention



- » 20% (1:57) of the workday >38° C
- » ~11% (65 min) of the working day at rest

**30% IKI** 

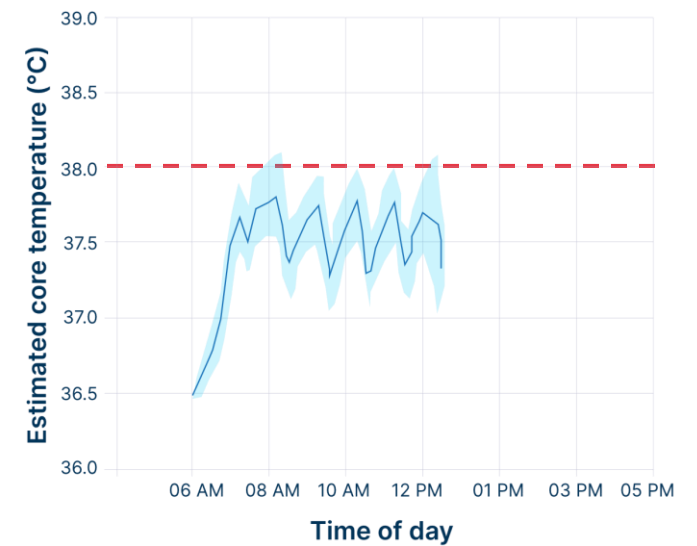
## Insufficient intervention



- » 18% (1:29) of the workday >38° C
- » ~10% (58 min) of the working day at rest

**17% IKI** 

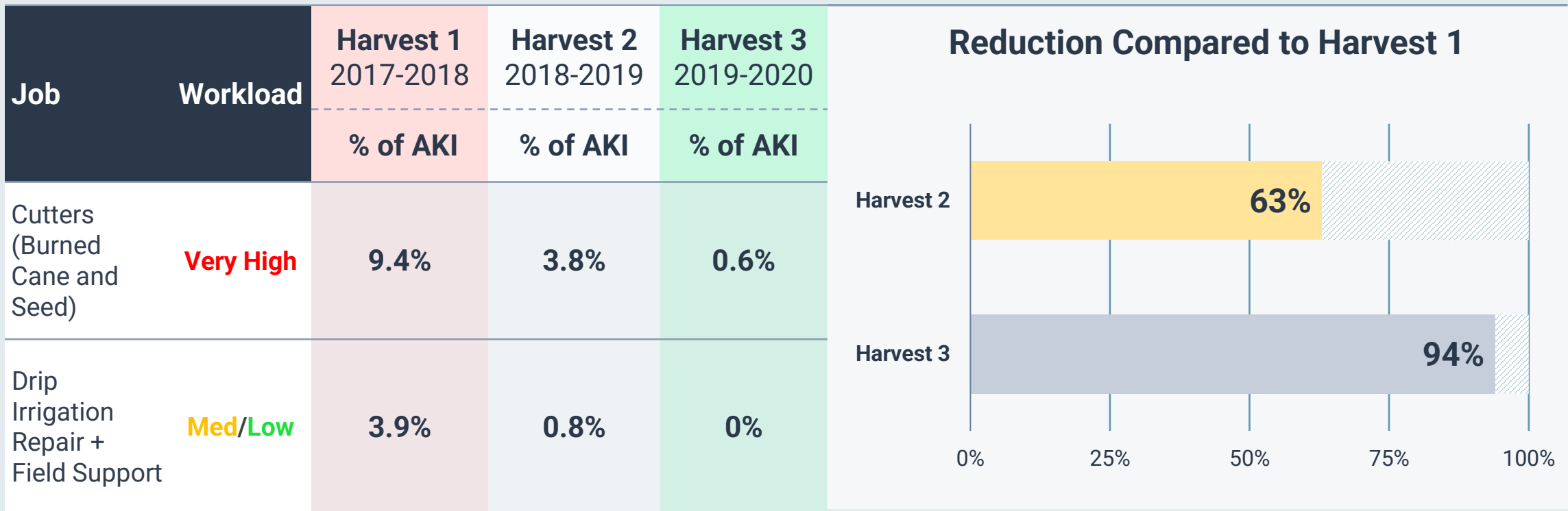
## Adelante Center of Excellence



- » 9% (0:32) of the workday >38° C
- » 23% (80 min) of the working day at rest

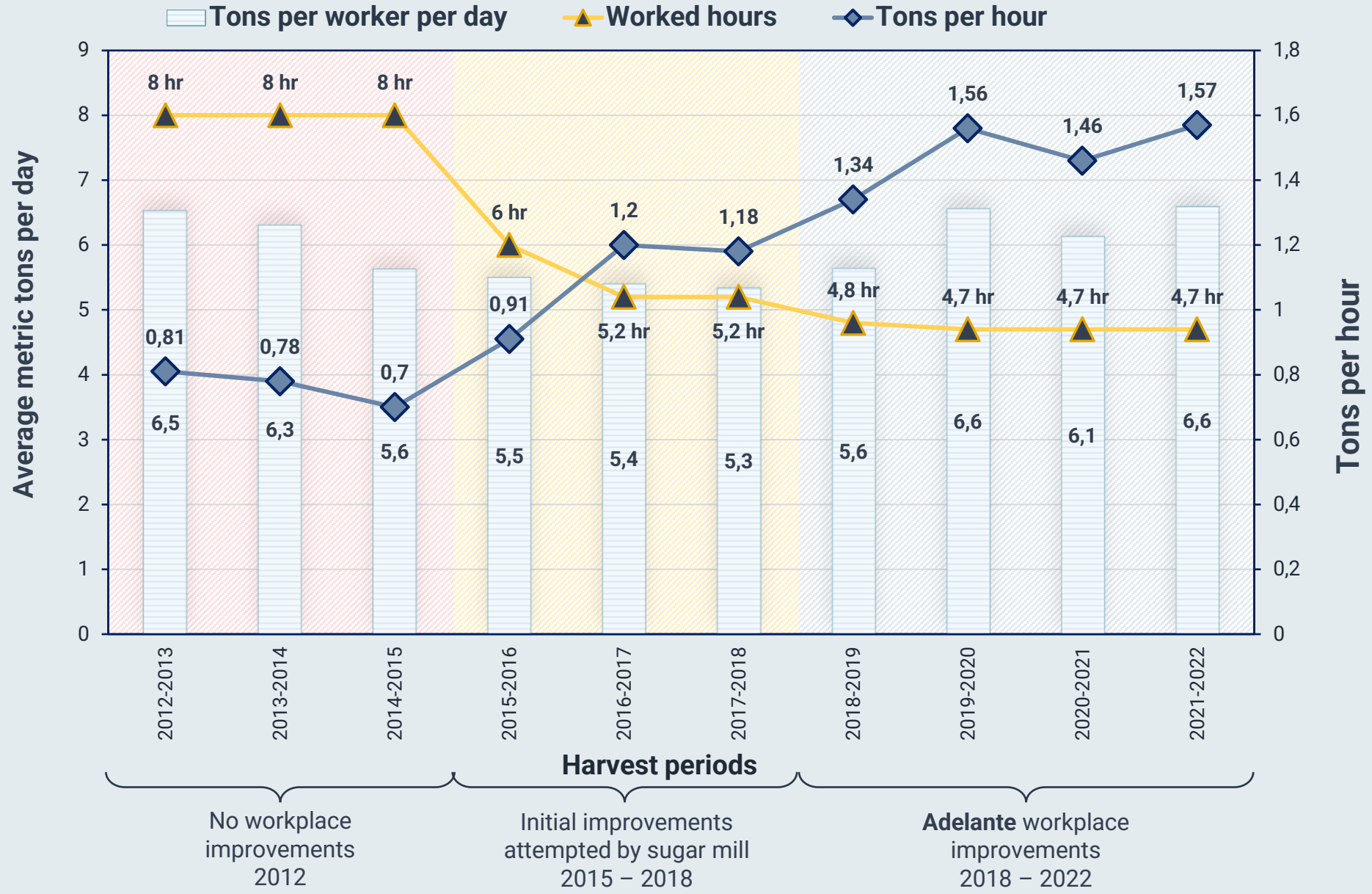
**1% IKI** 

# Reduction in Heat Stroke hospitalizations and Acute Kidney Injury (AKI)

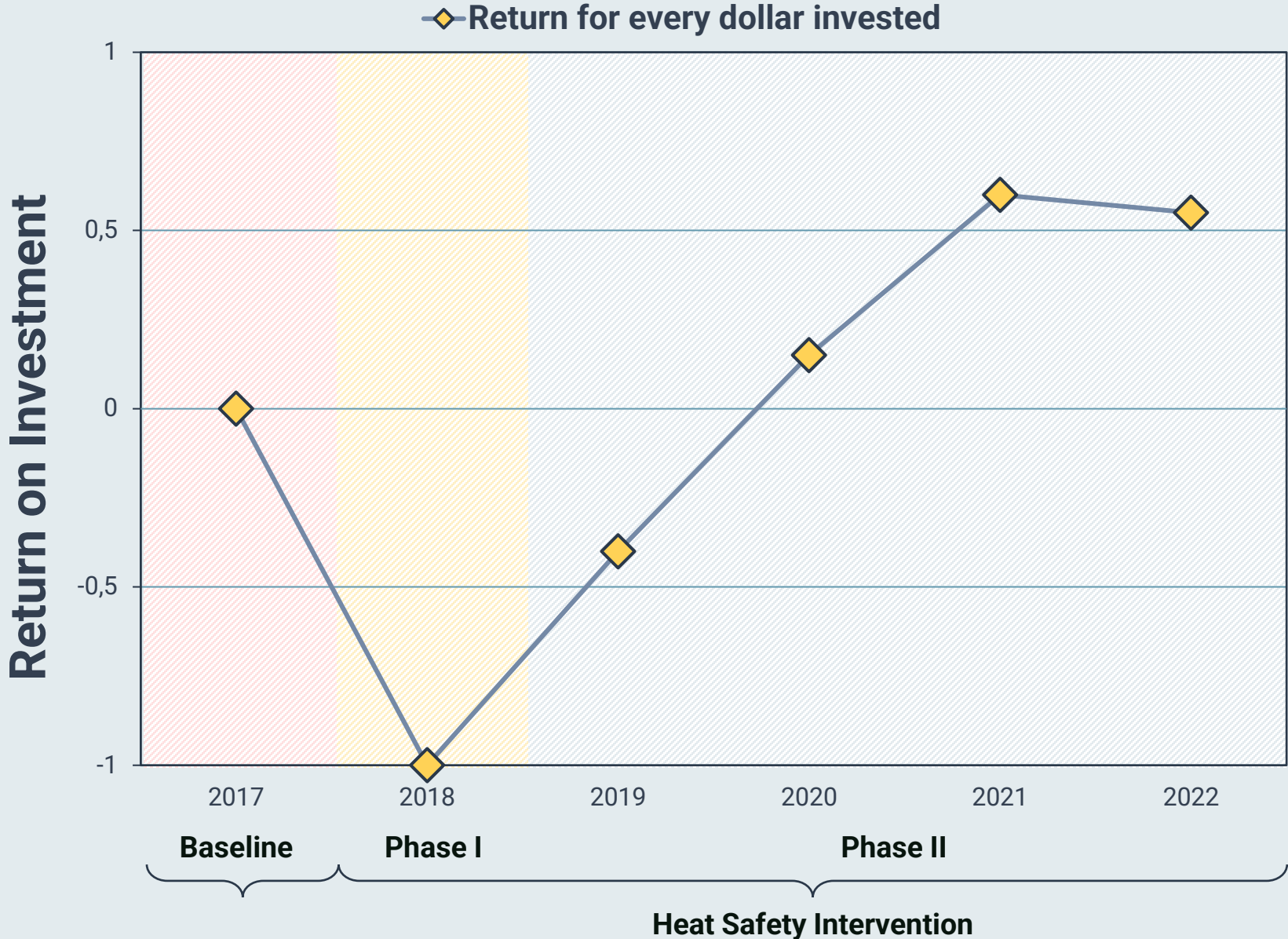




# Increase in Productivity, breaks support greater efficiency



# Provided an Return of Investment of 60%



ROI of 60% three years after the initial investment due to:

- » Lower staff turnover
- » Reduction in absenteeism
- » Reduction in accidents
- » Reduction hospital care
- » Ensures the well-being of the worker



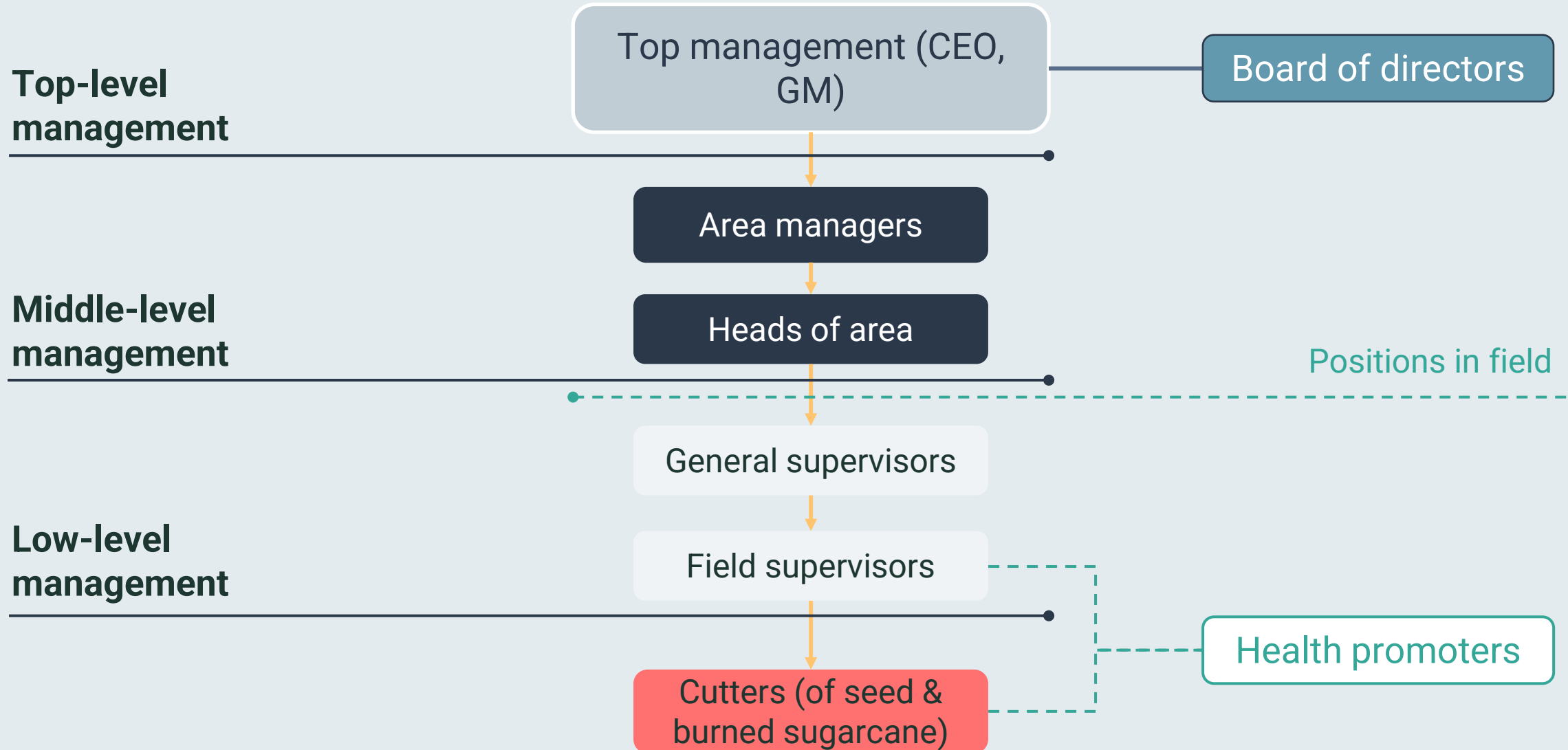
# Positive ROI in our Center of Excellence

## How?

- » Lower staff turnover
- » Reduces absenteeism
- » Reduces accidents
- » Reduces hospital care
- » Healthier workforce
- » Higher productivity
- » Improved finance terms from development banks



# Organizational Assessment Provides Insights





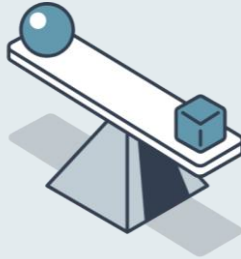
# Changed priorities and operational commitments



ACTIONS

## Align Metrics

Elevate health indicators alongside productivity.



## Embed Accountability

Tie RSH-h performance to supervisor reviews.



## Co-Design Practices

Involve members from Human Resources, OSH and Harvest teams in developing rest/shade protocols.



OUTCOMES

15%

Health & safety now account for **15 %** of every supervisor's performance score regardless of department



Enhanced management messaging from board to supervisors to workers clarified that both health and productivity are connected.

-XX%



Formalized health policy in operations to close accountability gaps and reduce kidney injuries

# And introduced policies still not found in most U.S. or E.U. Agriculture

- » Ended subcontracting
- » Paid sick leave for field workers;
- » Routine access to care and services;
- » Augmented pay, improving on the solely piece-rate system;
- » Routine data capture and implementation monitoring of heat stress intervention
- » Improved IT networking between harvest, HR, clinic, and OSH departments to identify, measure, and address both primary exposures/risks and upstream drivers.





# When Addressing Exertional Heat Stroke, Act with:



## H



### Heat Exposure

Identify if the individual has been in a hot environment or engaged in rigorous activity.

## A



### Altered Mental Status

Look for signs like headache, confusion, combativeness, fainting, ataxia, or disorientation.

## S



### Start Cooling

Begin cooling the patient immediately with cold or ice water. If there's no pulse, start CPR.

## T



### Time

Recognize the urgency. If these signs are present, call emergency services immediately.

## E



### Emergency

Act quickly to prevent further complications and ensure the best possible outcome.

# Adelante Initiative and PREP 4 Change: A Center of Excellence Model in Action

Bringing together workers, employers, researchers and practitioners with the support of governments and funding institutions.

Developing scalable, adaptive, and cutting-edge practices, technologies and policies with a space for peer-to-peer learning.





# We need businesses and governments to invest in regional Centers of Excellence, to protect workers, productivity and industry sustainability



# Case Study: Work with G's Group & Sainsbury's



Sainsbury's



Foros Comercio Ético  
Ethical Trade Forums

## Project Highlights:

- » Data-driven assessment of agricultural workers in Spain
- » Intensive collaboration between all project partners
- » Sharing results via LIN-authored report and community of best practices via Ethical Trade Forums





# Protecting Coconut Farmers from Rising Heat



## Project Findings:

- » **Challenge:** Coconut farmers face extreme heat, long hours, and little protection
- » **Current reality:** Self-managed breaks and hydration are the only safeguards
- » **Impact:** Heat illness is common, formal protections rare



## Solutions:

- » Introduce RSHH protocols
- » Supply climate-fit PPE and training
- » Integrate prevention into farmer groups and supply chains.



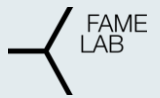


# Thank you

## And thank you to our colleagues and partners



### Key partners and funders





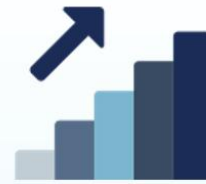
# How a CoE will benefit your company



**Increase  
productivity**



**Improve  
workforce health  
by reducing harm**



**Achieve a positive  
return on  
investment (ROI)**



**Reduce risk and  
liability for your  
organization**



**Strengthen your  
market position as  
a responsible  
company**

**SUSTAINABLE  
DEVELOPMENT  
GOALS**







**Thank you**

Together we get this done

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