Understanding the Value of Glyphosate in Protecting Hawai‘i

A position presented by the Hawai‘i Invasive Species Council (HISC) Research and Technology Working Group

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The Position

Glyphosate is the active ingredient in many herbicide formulations registered in the State of Hawai‘i to control non-native weed species in many different types of environments. Glyphosate-based herbicides are critical weed management tools that help maintain profitability in local agriculture, turf and landscape industries, prevent degradation of our natural environments, mitigate wildfires through creation of firebreaks and control of fire-prone invasive grasses, and reduce disease vector habitats. With several decades of regulated use, this pesticide technology has proven to be one of the most cost-effective options in weed control with no historical reports of environmental or human health impacts in Hawai‘i. The new Hawai‘i Interagency Biosecurity Plan (HIBP) provides an ambitious mission to protect against new and existing biological threats to the local economy, environment and health of our island state. Pesticides, including glyphosate, are integral technology options for rapid, effective interventions against these threats. We recognize growing interest by some stakeholders to limit or in some cases ban the use of chemical control options. Efforts to restrict or ban these tools, however, could compromise the feasibility of participating agencies for implementing a well-developed plan to protect Hawai‘i. We recommend a careful consideration of risk and benefits in any future discussions about policies relating to glyphosate use, and endorse the expertise within our state and federal agencies responsible for pesticide regulation.

The Controversy

In 2015, the International Agency for Research on Cancer (IARC) published an evaluation of glyphosate categorizing this chemical as “probably carcinogenic.” The IARC uses this classification when a positive association has been observed between exposure to the agent and cancer but other explanations for the observations, such as chance, could not be ruled out. A chart listing other substances that are probably carcinogenic to humans, such as very hot beverages and wood fires, is below.

In 2017, the US Environmental Protection Agency evaluated the cancer risk of glyphosate to humans in the *Draft Human Health Risk Assessment in Support of Registration Review*. The EPA determined that glyphosate was “not likely to be carcinogenic to humans” and supports continuation of current approved use patterns. So, how could we have apparently conflicting positions from respected scientific agencies?

IARC Evaluations of Selected Products and Chemicals	
Processed red meat (consumption) Alcoholic beverages Tobacco	*Carcinogenic to humans*
Very hot beverages Red meat (consumption) Glyphosate Biomass fuel (wood fire)	*Probably carcinogenic to humans*
Aloe vera whole leaf extract Gingko biloba Goldenseal root powder Kava extract Radio frequency Electromagnetic fields	*Possibly carcinogenic to humans*

Hazard vs. Risk

Hazard is defined as a potential source of harm or adverse health effect on a person, while risk is the likelihood of harm or adverse health effects due to exposure of the hazard. The IARC Monographs Program evaluates cancer **hazards** distinct from actual **risk**. This means that the IARC classified glyphosate as a hazard even though it may be unlikely to cause cancer with current known uses and exposure rates. The EPA conducts risk assessment of hazard exposures under normal or adverse use patterns. Therefore, the IARC determination of hazard and EPA determination of risk may not be conflicting.

Risk Management

Risk management is the process of identification, evaluation, and prioritization of risks, along with the adoption of corresponding measures to minimize the potential impact due to hazard exposure. Pesticide

risk in Hawai‘i is managed through the registration and regulation processes administered by the US EPA in coordination with the Pesticide Branch of the Hawai‘i Department of Agriculture. Each registered pesticide product has a set of vetted guidelines explicitly stating how, when and where a pesticide can be applied, as well as how much and by whom. The product label also describes any protective equipment or training required for the applicator. These specified conditions are determined by established scientific protocols that aim to minimize the risk factors to people and the environment. In addition, the College of Tropical Agriculture and Human Resources (CTAHR) offers the "Pesticide Risk Reduction Education" short course for educating and training professional applicators on proper pesticide stewardship. Any use of a registered pesticide that is inconsistent with the label instructions is illegal and punishable by law.

Alternate positions that support the prohibition of glyphosate potentially undermine the authority and regulatory protocols established by these federal and state agencies. A ban on glyphosate would also remove currently irreplaceable tools for combatting invasive species, creating extreme challenges for local, state and federal agencies charged with protecting the unique, fragile ecosystems of Hawai‘i. Prohibiting effective tools could potentially result in the irreversible debilitation of our food, water, residential landscapes, and rare native plants and animals, all of which are heavily impacted by invasive species. Prohibition of this tool could also result in increased costs for physical control of invasive plants in forests and urban environments.

Pesticides, including herbicides, are technologies that have greatly benefitted from public and scientific scrutiny over the decades since their introduction. Today’s pesticide safety standards and use guidelines are a direct result of this scrutiny and help ensure that the risks associated with exposure are minimized. When used according to label instructions, in concert with established integrated pest management practices, herbicides such as glyphosate are an invaluable tool in managing invasive plants.

To learn about the differences between hazards and risks of glyphosate go to:

International Agency for Research on Cancer, 2017. Some organophosphate insecticides and herbicides: tetrachlorvinphos, parathion, malathion, diazinon and glyphosate. IARC Working Group. Lyon: IARC Monogr Eval Carcinog Risk Chem Hum, 112, pp.9-31. https://monographs.iarc.fr/wp-content/uploads/2018/07/mono112.pdf

US Environmental Protection Agency. 2017. Draft Human Health and Ecological Risk Assessments for Glyphosate. https://www.epa.gov/ingredients-used-pesticide-products/draft-human-health-and-ecological-risk-assessments-glyphosate

To learn about the Hawai‘i Interagency Biosecurity Plan 2017-2027 go to:

Hawai‘i Department of Agriculture: http://hdoa.hawaii.gov/blog/main/nr17-02biosecurityplan/

Hawai‘i Invasive Species Council: http://dlnr.hawaii.gov/hisc/plans/hibp/

This position paper was prepared by the staff and stakeholders participating in the HISC Research and Technology Working Group and does not in and of itself reflect a position of the Council.