



Glyphosate Scientific Review

Update on Phase One Activities

May 23, 2022



Presentation Topics

- Introductions (ERG and Tetra Tech)
- Review of Phase One scope and schedule
- Glyphosate uses and alternatives
- Resources to evaluate in Phase Two
 - Human health impacts
 - Environmental impacts
- Stakeholders to contact in Phase Two
- Next steps

Phase One Scope/Schedule (1)

- Overall project scope:
 - “...conduct a scientific review of the potential impacts of glyphosate and its most common alternative herbicides on the environment and public health.”
- Phase One scope:
 - “...a summary of available information on the use of glyphosate in the Commonwealth and key herbicide agent alternatives”
 - “...a list of key assessments (e.g., recent assessments by recognized authorities...; peer reviewed publications; precedential judicial decisions)”

Phase One Scope and Schedule (2)

- Phase One scope (continued):
 - “...a list of key stakeholders to be consulted”
- Phase One presents the resources we will consider in Phase Two; Phase Two is the evaluation
- Status
 - Internal draft of Phase One report completed
 - Submit draft Phase One report this week
 - Submit final Phase One report after receiving and responding to comments
 - Phase One will be completed within budget

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Glyphosate Uses and Alternatives (1)

- Most widely used herbicide in the U.S. and around the world (e.g., Roundup)
- Used in row crop production (corn, soybeans), fruit growing, residential and commercial landscape maintenance, highways, railways, and government property weed control
- Uses in Massachusetts include corn and cranberry production, nursery operations, rights of way, and residential and commercial

Glyphosate Uses and Alternatives (2)

- Glyphosate usage in Massachusetts for different applications is uncertain
 - Better information for agricultural uses
- Potential alternatives include chemical, biological, physical, and mechanical methods
- Systemic herbicides often preferred by users
 - Lower maintenance and labor costs
 - Can be more effective than other alternatives (e.g., contact herbicides, mechanical)

Glyphosate Uses and Alternatives (3)

- Many chemical alternatives used in Massachusetts
- Phase One research presents some options for prioritizing chemical alternatives for evaluation in Phase Two
 - By type of application in Massachusetts (e.g., landscape maintenance, rights of way, certain types of crops)
 - By current usage of alternative herbicides in Massachusetts
- Stakeholders will be contacted to help direct the prioritization process and alternatives evaluated

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Human Health Impacts

- Discuss Phase One outputs
 - List of key assessments issued by authoritative bodies
 - Plan for conducting a literature search
 - List of precedential judicial decisions
- Key assessments
 - Different scopes, methods, and publication dates
 - Federal and state agencies
 - International bodies
 - Agencies from selected foreign governments

Human Health: Key Assessments (1)

- Assessments led by U.S. federal/state agencies
 - EPA glyphosate registration review docket (e.g., draft human health risk assessment, responses to comments, reviews of recent publications)
 - ATSDR's 2020 *Toxicological Profile for Glyphosate*
 - NTP's ongoing research on glyphosate and glyphosate formulations
 - U.S. Forest Service 2011 human health and ecological risk assessment of glyphosate
 - NCI/NIEHS-funded Agricultural Health Study
 - California's 2017 "Proposition 65" review of glyphosate

Human Health: Key Assessments (2)

- Assessments issued by international bodies
 - IARC's 2017 *Some Organophosphate Insecticides and Herbicides* monograph
 - European Union review of glyphosate, including assessments by the European Food Safety Authority (2015) and the Assessment Group on Glyphosate (pending)
 - A 2016 review of glyphosate residues in food products conducted jointly by the (a) Food and Agriculture Organization of the United Nations and (b) the Core Assessment Group on Pesticide Residues of the World Health Organization

Human Health: Key Assessments (3)

- Assessments issued by agencies from selected non-EU foreign countries:
 - 2017 Health Canada (Pest Management Regulatory Agency) review of human health impacts and pending 2022 update
 - 2016 Food Safety Commission of Japan assessment of glyphosate human health risks (executive summary only)
 - 2016 Australian Pesticide and Veterinary Medicines Authority regulatory position paper considering human health and ecological risks

Human Health: Literature Review

- Major assessments were based on systematic reviews of the literature prior to cutoff dates
- In recent years, several peer-reviewed publications have reported on glyphosate and cancer, reproductive effects, and other outcomes
- ERG to conduct a literature search in Phase Two:
 - Using PubMed
 - Focusing on articles issued between 2018 and 2022
 - Considering articles written in English

Human Health: Precedents

- Searched case law database using the Casetext Research software application
- Initial findings:
 - No case law out of Massachusetts state court
 - Most litigated issues are product liability and negligence, which are cited in toxic tort cases and regulatory law cases
 - Multiple toxic tort cases pertaining to allegations of glyphosate causing cancer (primarily lymphoma)
 - Recent lawsuit challenging EPA's registration decision regarding glyphosate

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Environmental Impacts (1)

- Key assessments
 - Phase One provides list of key ecological assessments, links to assessments, publication dates. Assessments thus far include:
 - Federal agencies (USEPA, USDA, USFS)
 - EU (ECHA, EFSA)
 - MDAR
 - Select peer-reviewed journal articles
 - NGOs (e.g., Forest Stewardship Council, NRDC, NOFA)
 - Most of the ecological assessments rely on EPA's analyses (e.g., EPA Interim Registration Review Decision)

Environmental Impacts (2)

- EPA FIFRA assessments focus on direct effects of glyphosate
 - Other effects uncertain:
 - Effects on non-target species (e.g., T&E plants)
 - Species habitat (e.g., honeybees, monarch butterflies)
- FIFRA assessments focus on active ingredient
 - Effects of actual products (containing adjuvants, other herbicides) uncertain

Environmental Impacts (3)

- Phase Two tasks will include:
 - Tetra Tech to conduct a literature search focusing on uncertainties of recent assessments as well as assessments of priority chemical alternatives
 - Tetra Tech will compile information on precedential judicial decisions pertaining to ecological risks of glyphosate as well as priority chemical alternatives

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Stakeholders to Contact (1)

- Reasons for contacting stakeholders:
 - Identify additional scientific publications
 - Ask questions about research and works in progress
 - Understand topics of greatest interest
- Categories of stakeholders to contact:
 - Scientific leads for major assessments
 - Massachusetts parties that register pesticides
 - Organizations voicing concern on glyphosate use
 - Organizations representing users of glyphosate

Stakeholders to Contact (2)

- Current considerations:

Scientific leads of assessments: <ul style="list-style-type: none">NCI designated contact(s)ATSDR designated contact(s)EPA designated contact(s)Agricultural Health Study contact(s)	Pesticide Board Subcommittee: <ul style="list-style-type: none">DPH designated contact(s)MDAR designated contact(s)DCR designated contact(s)Public member (Richard Berman)
Organizations voicing concern: <ul style="list-style-type: none">MASSPIRGNortheast Organic Farming Assn.Regeneration MassachusettsGreenCAPE	Organizations representing users: <ul style="list-style-type: none">MA Farm BureauMA Nursery and Landscape Assoc.MA Assoc. of Lawn Care ProfessionalsMA Assoc. of Landscape Professionals

Plus: MA Natural Heritage and Endangered Species Program; North American Invasive Species Management Association

Next Steps

- Phase One
 - ERG to submit *draft* Phase One report
 - Glyphosate Commission to provide feedback
 - ERG to submit *final* Phase One report
 - Glyphosate Commission to authorize work on Phase Two
- Phase Two
 - ERG and Tetra Tech to execute research methodology
 - ERG to submit draft Phase Two report
 - Glyphosate Commission to provide feedback
 - ERG to submit final *Phase Two* report