AERIAL HERBICIDE SOLUTIONS FOR FOREST MANAGEMENT IN MAINE

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NER.COFE

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CURRENT APPLICATION TECHNOLOGY : REDUCED RISK AND IMPROVED QUALITY

- Larger droplet technology to reduce drift
- Conventional booms with Accu-flo nozzles for effective swath placement.
- Smaller aircraft (Jet Rangers) and smaller block sizes.
- Larger droplet allows for higher allowable wind speeds (8-9 mph)


Ryder
Ryder

Conventional boom with drop down Accu-flo 0.020nozzles

ThruValve Boom with 0.020 nozzles

DROPLETS FROM AN ACCU-FLO™

Uniform Droplet Pattern produced from an ACCU-FLO™ Nozzle as seen under a strobe

DESIGN RESULTS

PRODUCES A TIGHT SPECTRUM OF DROPLET SIZES

- .016 500-700 MICRON COARSE
- **.020 600-800 MICRON** MODERATE RAIN, MINIMAL DRIFT
- **.028 800-1000 MICRON** MODERATE RAIN, MINIMAL DRIFT
- .047 1400-1500 MICRON VERY COARSE, VERY LITTLE DRIFT
- .063 2500-3000 MICRON VERY COARSE, VERY LITTLE DRIFT
- .085 4000-4500 MICRON VERY COARSE, VERY LITTLE DRIFT

CURRENT APPLICATION TECHNOLOGY : REDUCED RISK AND IMPROVED QUALITY

- In Maine customers and applicators are using the closed system batching associated with the 30 gal returnable/refillable premixed herbicide containers
- Decreases the risk of handler and environmental (spills) danger during the batching process.
- Premixed prescriptions allow for less mixing errors and correct application rates.
- AUTOCAL system allows for pump pressure changes with speed to apply the correct rate per area.

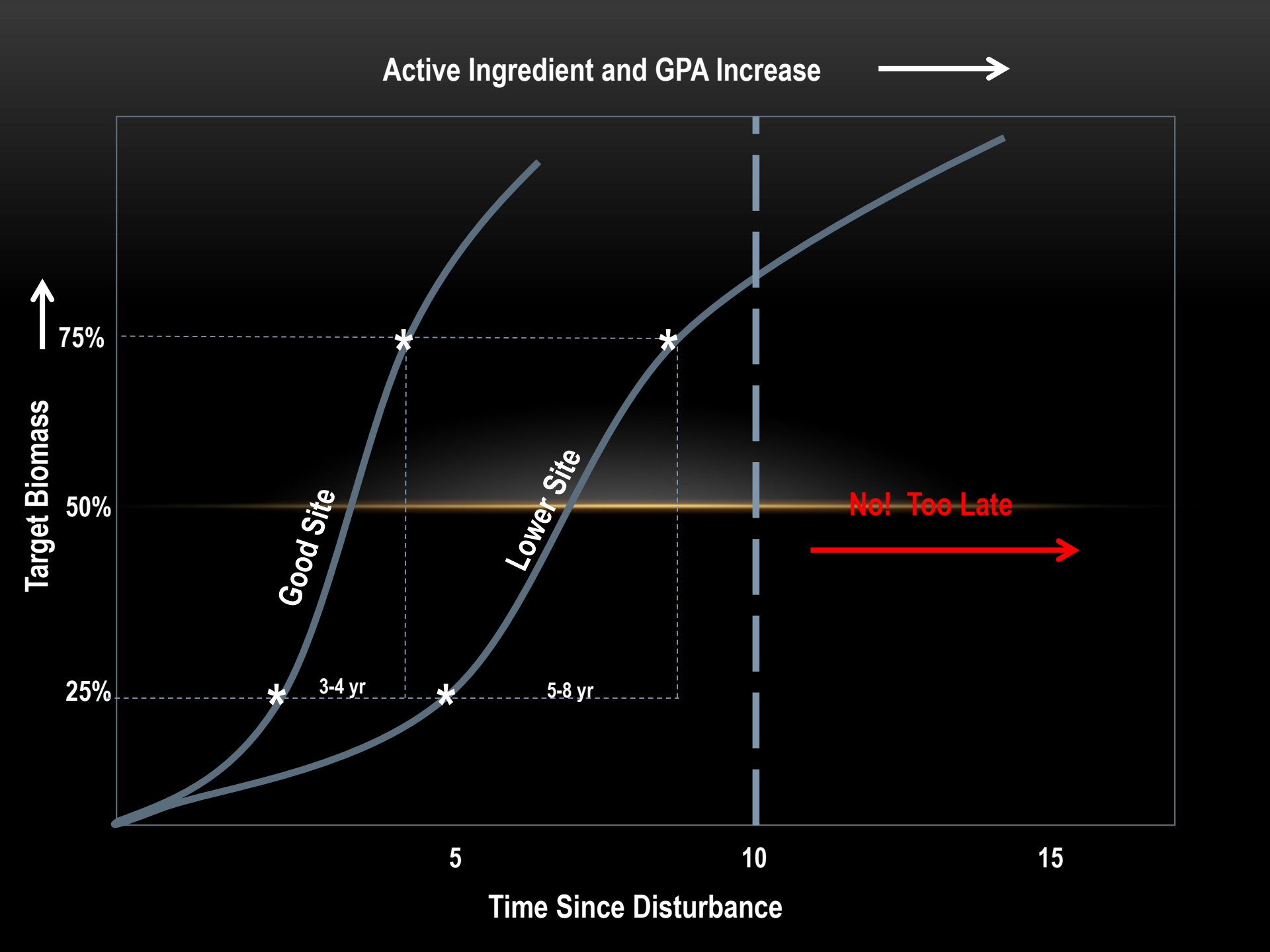
CLOSED SYSTEM BATCHING WITH RETURNABLE-REFILLABLE PRE-MIXED CONTAINERS SYSTEM

AERIAL APPLICATION IN MAINE

- In the past, most application was softwood release performed in August-September.
- Total annual acres treated has dropped considerably from 50,000 to 10-15,000 acres.
- Acreage is gradually going up, with Site Preparation becoming more prevalent in the industrial ownership.
  - 2016 - 16,000 acres
  - 2017 - 15,000 acres
  - 2018 - 18,500 acres
- Breakdown by treatment scenario:
  - 2016 – Site Prep (2500), release (13,500)
  - 2017 – Site Prep (1200), release (13,800)
  - 2018 – Site Prep (4100),SW release (13,000), SM release (1,400)

THE ROLE OF HERBICIDES IN FORESTRY

- When competition overwhelms crop trees both the investment and the assumption are lost
- Timing and site quality are important factors in controlling competition


Active Ingredient and GPA Increase
Target Biomass
75%
50%
25%
Good Site
Lower Site
No! Too Late
3-4 yr
5-8 yr
5
10
15
Time Since Disturbance

NEW ENGLAND AERIAL FORESTRY

- **Glyphosate** (Rodeo, Accord XRT II)
- **Imazapyr** (Arsenal AC, Polaris AC)
- **Sulfometuron Methyl** (Oust XP)

THREE RELEASE TREATMENT SCENARIOS

- Release Treatments
  - Sugar Maple/Softwood
  - Spruce Plantations
  - Natural softwood stands

COMMON PLANTATION RELEASE PRESCRIPTIONS FOR MAINE

- Total volume applied is 5 -8 gallons per acre. Heavier weed biomass would dictate higher volumes.
- Glyphosate labelled release rates are 1.5 – 2.25 quarts per acre (2-3 lbs active per acre).
- Imazapyr (53%) is added at 1 ounce/acre for maple competition.
- Sulfometuron methyl (Oust XP) is added for heavy herbaceous and grass competition at 1-3 ounces/acre.

NATURAL SOFTWOOD RELEASE

- Rates are usually 6-8 GPA .
- Depends on whether the hardwood trees overtop the softwood regeneration.
- Older sites with taller hardwoods can be treated effectively at 6 GPA.
- Usually apply a rate of 1.85 qts per acre of glyphosate.
- Higher if maple is a significant component, and also may add some imazapyr.

IMPROVING THE COMPOSITION OF BEECH-DOMINATED NORTHERN HARDWOOD UNDERSTORIES IN NORTHERN MAINE

Robert Wagner & Andrew Nelson

Cooperative Forestry Research Unit

University of Maine

Orono, ME

CFRU

1865 THE UNIVERSITY OF MAINE

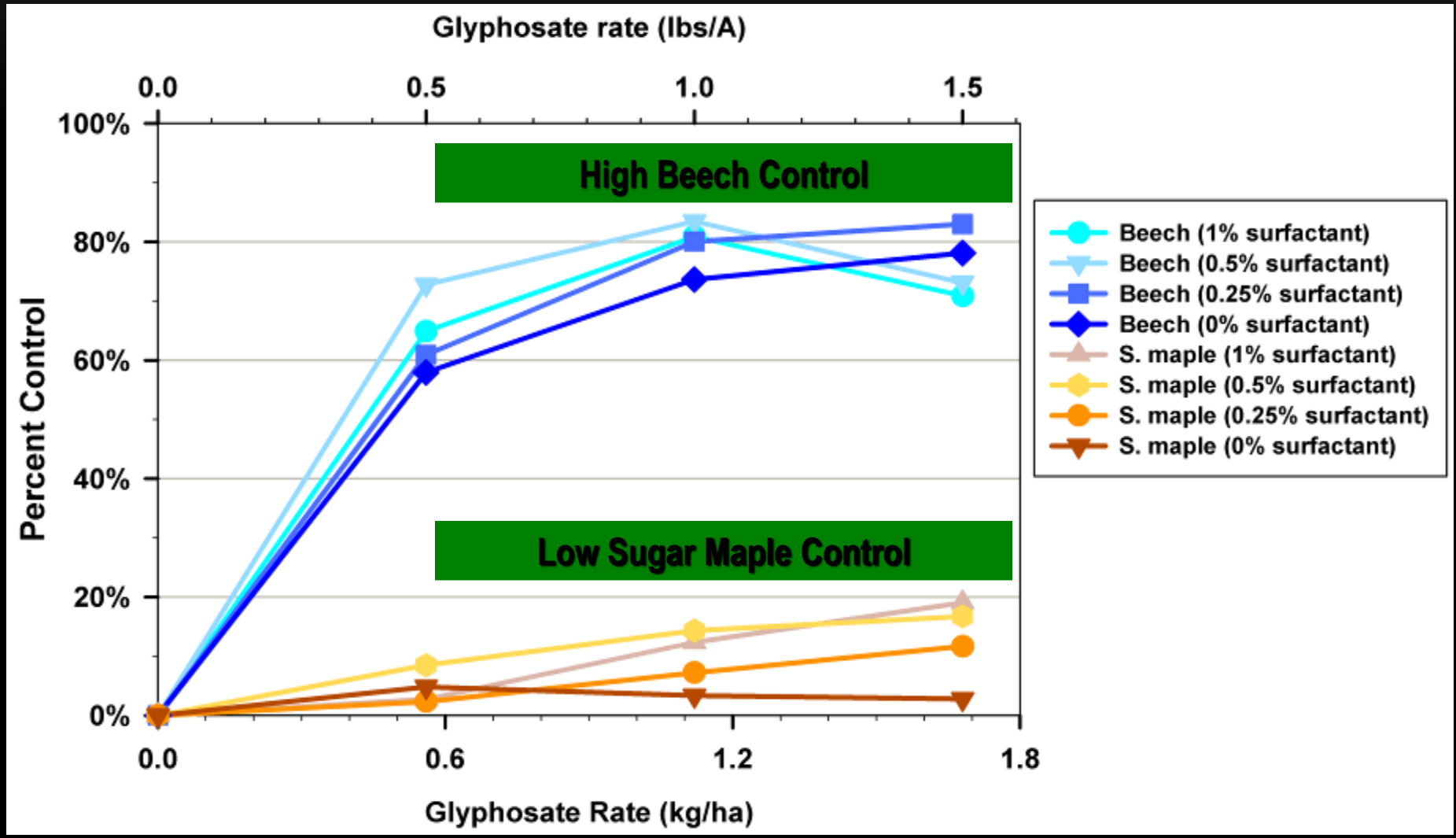
Objective

Develop an effective and low-cost vegetation management strategy after harvest that could substantially reduce beech abundance and enhance the regeneration of more desired hardwood species (sugar maple, yellow birch, red maple)

Hypothesis

There is an optimum combination of glyphosate herbicide and surfactant that can successfully control beech regeneration while preserving desirable maple species (red & sugar)

3RD-YEAR CONTROL OF BEECH AND SUGAR MAPLE TO TREATMENTS



CONCLUSIONS

- 3rd-year results indicated that glyphosate treatments selectively shifted species composition from beech to sugar and red maple
- "Sweet Spot" of maximum beech control and minimal sugar maple control obtained with 1 lb/A glyphosate and between 0.25% and 0.5% surfactant
- Glyphosate rate mattered more than surfactant
- Hardwood species varied in susceptibility to glyphosate in the following order:

  beech > str. maple > yellow birch > red maple > sugar maple

- Results transferable to tractor-mounted mistblower applications
- Results were very robust across a wide range of application rates, surfactant, application methods, sites, and time.

COMMERCIAL IMPLEMENTATION OF THE SUGAR MAPLE RELEASE IN MAINE

- Applications have been performed via helicopter and skidder mounted mist blower.
- Timing is usually later in the summer to allow for effective softwood release
- Averaging maybe 1000+ aerial acres per year in Maine
- For effective release we have to concentrate on stands having the ideal target biomass and not chase stands that are too far gone (heavy tall biomass)

AERIAL SUGAR MAPLE RELEASE

Once the overstory is removed an aerial application can be accomplished.

Application volume is usually 6-8 GPA, with 1.5-1.85 quarts/acre of glyphosate.

SUGAR MAPLE RELEASE

SUGAR MAPLE RELEASE WITH SKIDDER MOUNTED MISTBLOWER

- Shelterwood systems where Sugar Maple and Birch crop trees are left.
- Beech and Striped Maple biomass should be less that 12 feet (4m) in height.
- Changes understory to a mixedwood site of Sugar Maple and softwood.


NO!!! Too Late! Invest your $ wisely

QUESTIONS?

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GLYPHOSATE??

What is the Risk?
Does it Cause Cancer in Humans?

Developed and Registered by Monsanto in the early 70's
(approaching 50 years of data!)

GLYPHOSATE??

Personally, I believe the answer is whether you believe in science or the emotional wave generated from public statements based on the lack of science.

WHO – World Health Organization

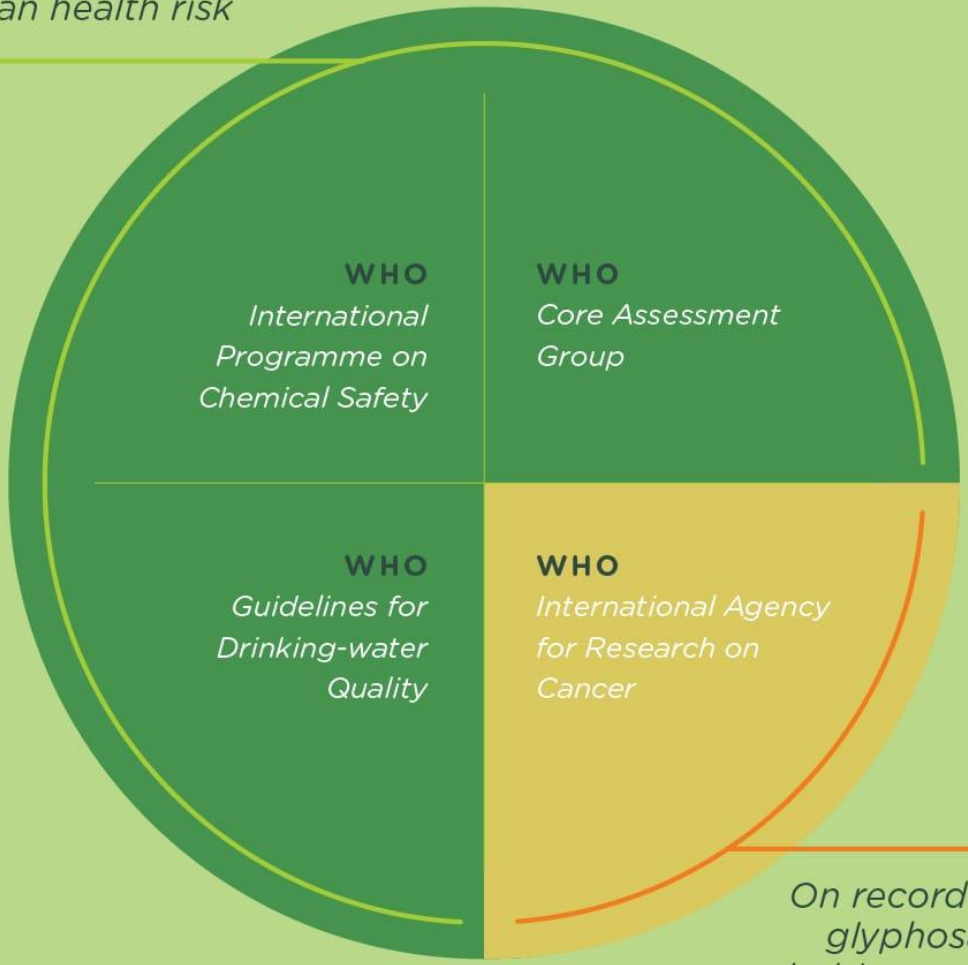
In 2015 the International Agency for Research on Cancer (a branch of the WHO) classified Glyphosate as a probable carcinogen (IARC Monograph 112).

This Agency is one of four agencies that make up the WHO

The other three agencies of the WHO do not agree with the classification above.

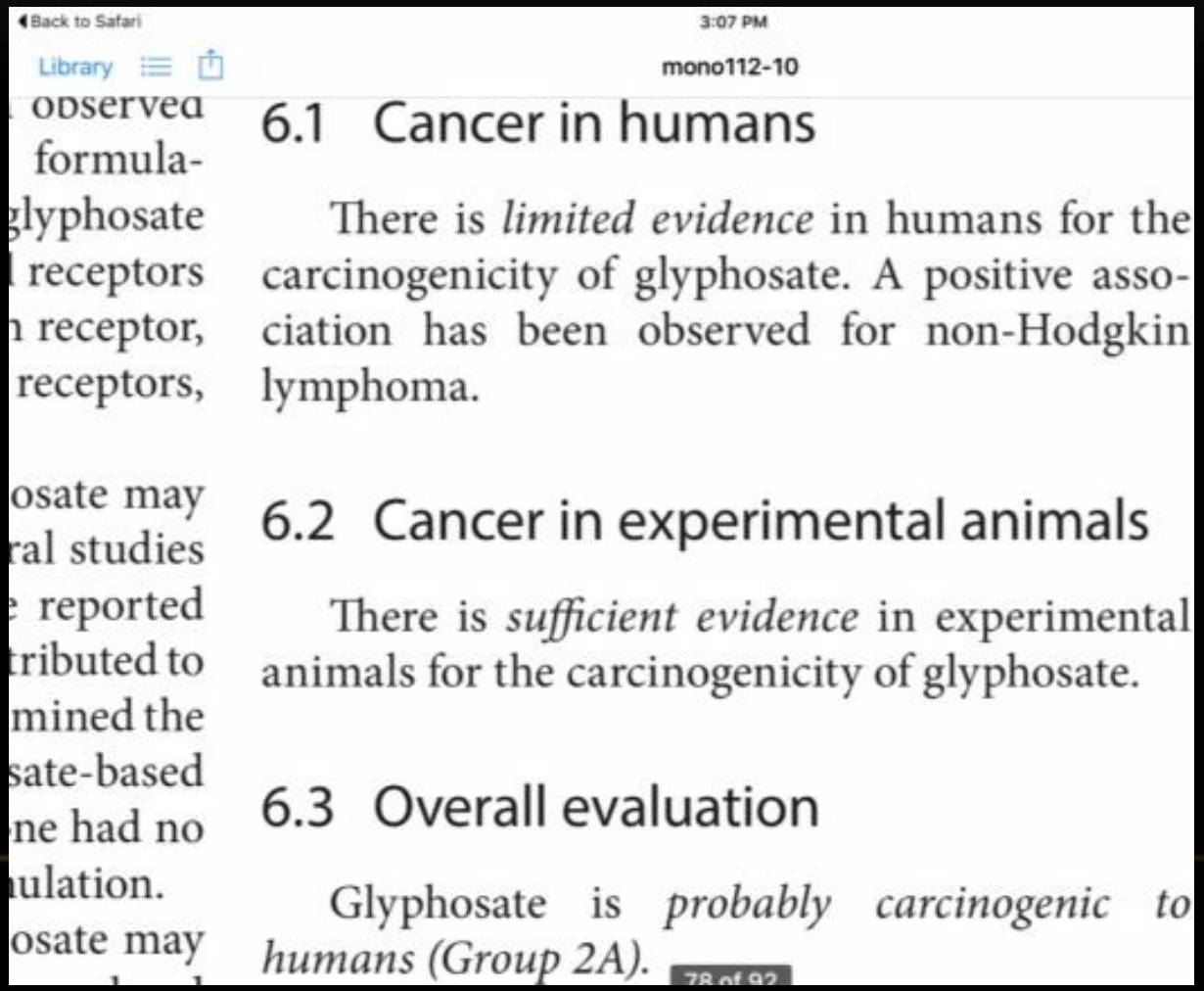
3 out of 4 WHO programs agree on glyphosate safety

*On record saying glyphosate **does not** present a cancer or human health risk*



On record saying glyphosate is a probable carcinogen

IARC Monograph 112 Statement – as written in the summary of their study



Since the WHO classification in 2015, a large number of regulatory organizations have undergone rigorous scientific reviews of glyphosate and determined that it is NOT a human carcinogen.

THE SCIENCE BASED LIST!

- Canadian Pest Management Regulatory Agency (PMRA) 4/2015, 4/2016
- European Chemical Agency (ECHA) Committee for Risk Assessment (RAC) 3/2017
- Korean Rural Development Administration (RDA) 3/2017
- Australian Pesticides and Veterinary Medicines Authority (APVMA) 10/2016
- Expert Panels on Glyphosate – Peer Reviewed in Critical Reviews of Toxicology 9/2016
- United States EPA 6/2015, 10/2015, 9/2016
- New Zealand – EPA 8/2016
- German Federal Institute for Occupational Safety and Health 5/2016
- Joint FAO/WHO meeting on Pesticides Residues 5/2016
  - "glyphosate is unlikely to pose a carcinogenic risk to humans from exposure to diet"
- Japan – Food Safety Commission (FSC) 3/2016
- European Food Safety Authority (EFSA) 11/2015

THE SCIENCE BASED LIST!

- The most recent evaluation by Health Canada that just came out January 2019.
- “After a thorough scientific review, we have concluded that the concerns raised by the objectors could not be scientifically supported when considering the entire body of relevant data. The objections raised did not create doubt or concern regarding the scientific basis for the 2017 re-evaluation decision for glyphosate.”
- “**No pesticide regulatory authority in the world currently considers glyphosate to be a cancer risk to humans at the levels at which humans are currently exposed.** We continue to monitor for new information related to glyphosate, including regulatory actions from other governments, and will take appropriate action if risks of concern to human health or the environment are identified.”

WHO-ville, USA

The Anti-Glyphosate Movement decided to ride this legless "Who-horse" into California where a judge with a lot of scientific background decided to change state regulations regarding glyphosate!

In the United States, a California judge took the IARC assessment into account in a separate legal case in March when ruling that the state can require RoundUp to carry a warning label that it may cause cancer. Monsanto is now facing further litigation from hundreds of plaintiffs across the United States who say glyphosate gave them or their loved ones non-Hodgkin lymphoma, citing the IARC assessment as part of their claims.

Ron Lemin's Parting Remarks!

- ***Not everything you see on the internet is true or even science based***
- ***Make sure the research is peer reviewed!***
- ***If the paper talks about Toxicity and not Risk we are barking up the wrong tree.***
- ***Risk = Toxicity X Exposure***

  glyphosate toxicity is low, and our exposure is minimal

- ***You have to decide whether you believe the science or the emotion?***
- ***GMO??? What is the glyphosate attack actually directed toward?***

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