Reducing Chemical Use on University of Michigan's Campus

Anya Dale and Kenneth Keeler
University of Michigan Office of Campus Sustainability

planet blue
UNIVERSITY OF MICHIGAN

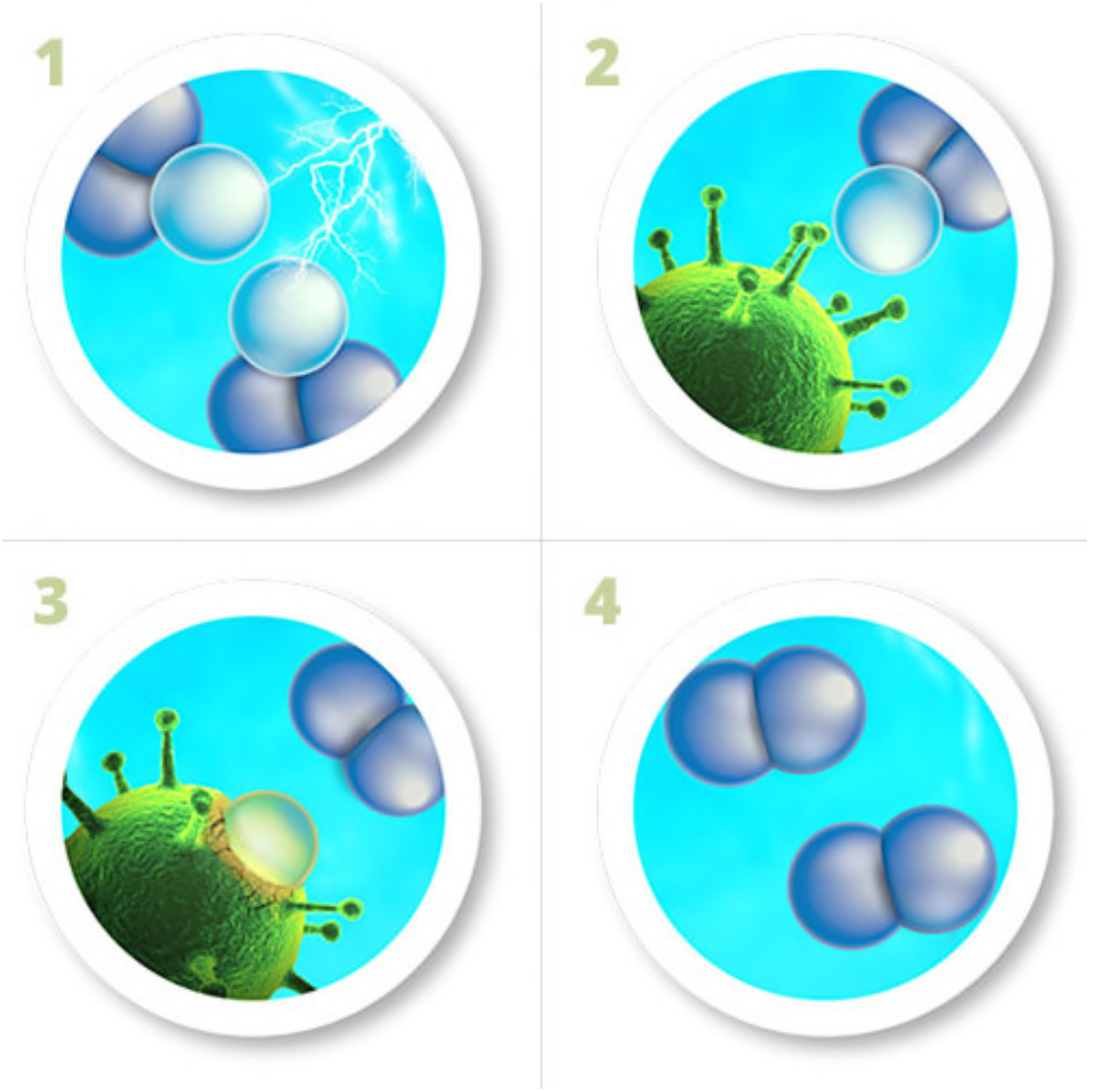
- 3,300 Acres - 5 Campuses
- 44,000 Students
- 43,000 Faculty & Staff
- 380 buildings >36 million ft^2
- 7.7 trillion BTUs energy
- 710,000 $MTCO_2E$
- 1.2 billion gallons water
- 18 thousand tons waste

2025 Sustainability Goals

- Climate Action
- Waste Prevention
- Healthy Environments
- Community Awareness

Heritage Wind Farm

Green Cleaning

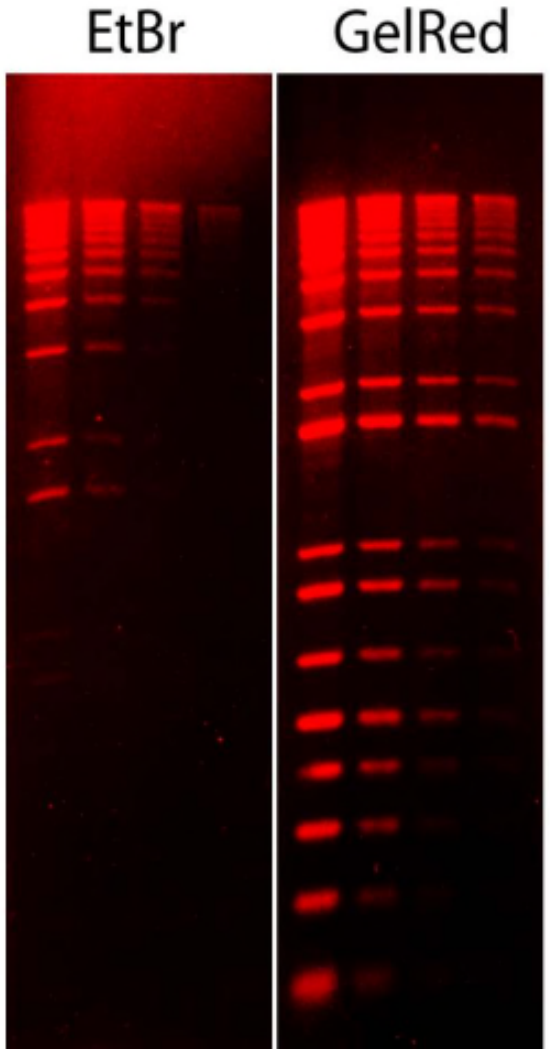


Aqueous Ozone

Kills 99.999% of test bacteria within 30 seconds.

Used in approximately 90% of residence hall cleaning and throughout University Unions.

Tersano 2002



Sustainable Labs: Chemical Substitution

Healthy Environment:

Protect Huron River water quality by reducing synthetic land application chemicals by 40%

2,600 acres of green space and many partners

Sustainable Land Management Guidelines :

- consider local climate and environment, and require minimum resource inputs
- preserve resources
- reduce stormwater runoff & pollutants
- avoid or minimize the use of chemicals through:
  - Prioritizing less harmful land management chemicals (minimum amount and toxicity necessary)
  - Implementing IPM
  - Proper plant selection
  - Irrigation efficiency
- Ongoing review and evaluation of products and practices

Some methods to reach this goal are:

1. Stormwater runoff reduction by limiting the effects of urbanization
2. Reducing frequency and rates of applications
3. Prioritizing more environmentally friendly options
4. Reducing maintenance area and levels

Healthy Environment:

Protect Huron River water quality by reducing synthetic land application chemicals by 40%

U-M owns 2,600 acres of green space. How that land is managed impacts the health of the Huron River and its watersheds. Healthy soils need fewer topical chemical inputs to grow healthy plants.

With this in mind, each U-M entity responsible for managing land has teamed to:

- Expand low-mow areas
- Integrate more native landscaping
- Reduce fertilizer applications
- Switch to organic:
- 75% of fertilizer used is organic
- Northwoods IV & V being organically maintained.
- Prioritizing more benign land management chemicals: Central Diag and Ingalls Mall were piloted in 2014 for a more ecofriendly weed preventative / treatment.
- Expand Environmental Certifications

Healthy Environment:

Protect Huron River water quality by reducing synthetic land application chemicals by 40%

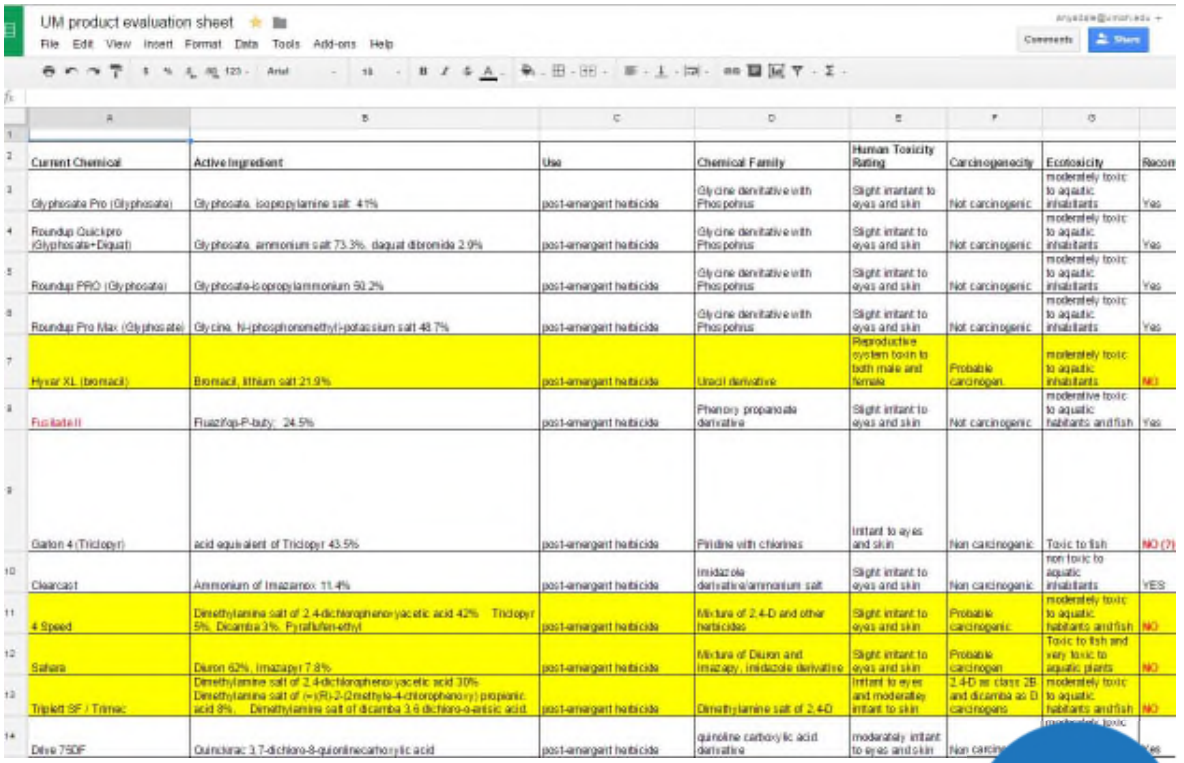
- The 54 percent reduction is largely due to a campus-wide transition toward using organic fertilizer on lawn areas.
- Most recently, the Diag was treated using a more environmentally friendly weed treatment that uses iron chelate rather than toxic synthetic chemicals to kill weeds, and is approved by the EPA as a low-risk alternative.
- Northwoods V & IV: Entirely organically managed.

Healthy Environment:

Protect Huron River water quality by reducing synthetic land application chemicals by 40%

- Current Chemical:
  - Active ingredient
  - Use
  - Chemical family
  - Human Toxicity Rating
  - Carcinogenecity
  - Ecotoxicity
- EPA studies
- Review by staff Chemist
- Scholarly article reviews

- Recommendations for use
- Investigations of potential alternatives



UM product evaluation sheet

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Current Chemical	Active Ingredient	Use	Chemical Family	Human Toxicity Rating	Carcinogenecity	Ecotoxicity	Recom
Glyphosate Pro (Glyphosate)	Glyphosate, isopropylamine salt 41%	post-emergent herbicide	Glycine derivative with Phosphorus	Slight irritant to eyes and skin	Not carcinogenic	moderately toxic to aquatic inhabitants	Yes
Roundup Quickpro (Glyphosate+Diquat)	Glyphosate, ammonium salt 73.3%, diaquat dibromide 2.9%	post-emergent herbicide	Glycine derivative with Phosphorus	Slight irritant to eyes and skin	Not carcinogenic	moderately toxic to aquatic inhabitants	Yes
Roundup PRO (Glyphosate)	Glyphosate-isopropylammonium 50.2%	post-emergent herbicide	Glycine derivative with Phosphorus	Slight irritant to eyes and skin	Not carcinogenic	moderately toxic to aquatic inhabitants	Yes
Roundup Pro Max (Glyphosate)	Glycine, N-(phosphonomethyl)-,potassium salt 48.7%	post-emergent herbicide	Glycine derivative with Phosphorus	Slight irritant to eyes and skin	Not carcinogenic	moderately toxic to aquatic inhabitants	Yes
Hyvar XL (bromacil)	Bromacil, lithium salt 21.9%	post-emergent herbicide	Uracil derivative	Reproductive system toxin to both male and female	Probable carcinogen	moderately toxic to aquatic inhabitants	NO
Fusilade II	Fluazifop-P-butyl: 24.5%	post-emergent herbicide	Phenoxy propanoate derivative	Slight irritant to eyes and skin	Not carcinogenic	moderatve toxic to aquatic habitants and fish	Yes
Garlon 4 (Triclopyr)	acid equivalent of Triclopyr 43.5%	post-emergent herbicide	Pirdine with chlorines	Irritant to eyes and skin	Non carcinogenic	Toxic to fish	NO (?)
Clearcast	Ammonium of Imazamox: 11.4%	post-emergent herbicide	Imidazole derivative/ammonium salt	Slight irritant to eyes and skin	Non carcinogenic	non toxic to aquatic inhabitants	YES
4 Speed	Dimethylamine salt of 2,4-dichlorophenoxyacetic acid 42% Triclopyr 5%, Dicamba 3%, Pyraflufen-ethyl	post-emergent herbicide	Mixture of 2,4-D and other herbicides	Slight irritant to eyes and skin	Probable carcinogenic	moderately toxic to aquatic habitants and fish	NO
Sahara	Diuron 62%, Imazapyr 7.8%	post-emergent herbicide	Mixture of Diuron and Imazapy, imidazole derivative	Slight irritant to eyes and skin	Probable carcinogen	Toxic to fish and very toxic to aquatic plants	NO
Triplet SF / Trimec	Dimethylamine salt of 2,4-dichlorophenoxyacetic acid 30% Dimethylamine salt of (+)-(R)-2-(2methyl-4-chlorophenoxy) propanic acid 8% Dimethylamine salt of dicamba 3,6 dichloro-o-anisic acid	post-emergent herbicide	Dimethylamine salt of 2,4-D	Irritant to eyes and moderatley irritant to skin	2,4-D as class 2B and dicamba as D carcinogens	moderately toxic to aquatic habitants and fish	NO
Drive 75DF	Quinclorac 3,7-dichloro-8-quinolinecarboxylic acid	post-emergent herbicide	quinoline carboxylic acid derivative	moderately irritant to eyes and skin	Non carcin		Yes

Extensive Green Certifications for Responsible Land Management Practices

- Washtenaw County Community Partners for Clean Streams, which specifically targets water quality
- Michigan Clean Corporate Citizens Program
- ePar environmental management system
- Audubon Cooperative Sanctuary Program
- Michigan Turfgrass Environmental Stewardship Program

COMMUNITY PARTNERS FOR CLEAN STREAMS

Michigan Turfgrass Environmental Stewardship Program

Huron River Watershed Council

Audubon International

Find Out More…..

www.sustainability.umich.edu

www.ocs.umich.edu

kkeeler@umich.edu
anyadale@umich.edu