

**IOWA**

# REPORT ON UNIVERSITY OF IOWA PESTICIDE AND FERTILIZER USE

BASED ON AVAILABLE DATA FOR CALENDAR YEAR 2018

**IOWA**

Office of Sustainability  
and the Environment





## ACKNOWLEDGMENTS

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# INTRODUCTION

## PESTICIDES AND PUBLIC HEALTH

The 1994 Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) defines a pesticide as any substance or mixture of substances that is intended to be used for regulating plant growth and defoliating plants or for preventing, destroying, repelling, or mitigating any pests (1). The term includes, but is not limited to, herbicides, insecticides, fungicides, algacides and rodenticides.

Pesticides were intentionally created for the control of pests and disease carriers responsible for public health problems and agricultural disasters. According to the EPA, pesticides help reduce and control vector-borne diseases, asthma and allergies, microbial contamination, avian flu, prions, and anthrax (2). However, pesticides can also pose risks to people if not used, handled or stored properly. According to the EPA, most people are rarely ever exposed to pesticide levels that can pose any risk, except pesticide workers (3). Currently, the EPA commits to efforts for the protection of pesticide workers, endangered species, and pollinators and to reduce the number of occurrences of a phenomenon called pesticide drift.

At the state level, Chapter 45 of the Iowa Administrative Code requires commercial applicators to have records of all application activities and maintain these records for two years from the date of use of the pesticide (4). Such records contain information about the license, landowner or customer, location of application, the product used, the quantity applied, and weather conditions during time of application. At the federal level, the EPA does not require private applicators to maintain records. Under the EPA Plan for the Federal Certification of Applicators of Restricted Use Pesticides within Indian Country, also known as the 2014 EPA Plan, commercial applicators must also include the information listed above about any restricted-use pesticides and would also keep these records for two years if they apply pesticide in “areas of Indian country” covered by the plan (5). Under the 1990 Farm Bill, the United States Department of Agriculture (USDA) also requires all private pesticide applicators to keep records of their use of federally restricted-use pesticide applications for two years (6).

Through FIFRA the Secretary of Agriculture can collect statewide or regional data on the use of pesticides to control pests and diseases from surveys of farmers and other sources (1). The USDA oversees the Pesticide Data Program, a national pesticide residue database program, focusing on the pesticide residues in the U.S. Food Supply (7). Additionally, the U.S. Geological Survey (USGS) provides estimates of agricultural pesticide use for many pesticides at the state and county level (8). This data is based on surveys and estimates of harvested crop acres collected for the Pesticide National Synthesis Project (8). The EPA Office of Pesticide Programs developed a report providing the expenditures, volume of pesticide applied, number of pesticides and applicators for the years 2008-2012 (9). It has been the only report since then. However, there is no pesticide use reporting that is comprehensive enough to include home-and-garden, industrial, institutional and agricultural use.

## MOTIVATION FOR THIS REPORT

The Pentacrest, the heart of campus, is known for its green turfgrass almost year-round. However, the effort, money, labor, and chemicals put into maintaining this turfgrass may be taken for granted by many. The Pentacrest is just one area on the UI campus that requires lawn care and maintenance. The University of Iowa spans across more than 1,900 acres of which just over 15% is maintained turf. It is also home to 8,000 trees and 24 acres of planted beds. Though some appreciate the greenery and aesthetic of the campus, there continues to be concerns over

the practices of the pesticide applications on campus lawns.

Over Labor Day weekend in 2019, UI Landscaping Services treated Pentacrest lawns with fertilizers and herbicides. As required by the law, signs were placed on the lawns to make students, faculty, staff and other University of Iowa community members aware of the risk of chemical exposure. Despite the signage, some individuals accessed the Pentacrest lawns and sat on the grass, drawing media attention from the *Daily Iowan* (“UI treats lawns with chemicals, students unaware of health risks”) (10). A similar incident also occurred in 1990 when the UI

Environmental Coalition expressed concerns over the size of the signs posted after pesticide application and lack of publicly available information about such application by UI Landscaping Services (11). Importantly, in both cases, all UI Landscaping Services’ practices were in accordance to Chapter 45 of the Iowa Administrative Code (12).

As the number of sustainability-conscious community members grows at the University of Iowa, the demand for action and data transparency increases. Throughout the years, faculty, staff, students, and community members have expressed their concerns over pesticide applications on campus lawns with little known correspondence from the University. In 1994, the University of Iowa formed a pesticide and herbicide task force to investigate the University’s use of pesticide and herbicides (13). However, there is no known documentation of any studies, data, or information disseminated by this task force. Today, such a task force no longer exists.

Over the past several years and in response to these more high profile application events, both the Office of Sustainability and the Environment (OSE) and the Center for Health Effects of Environmental Contaminants (CHEEC) have received numerous inquiries about risks and the extent of pesticide use at the University of Iowa. Motivated by these inquiries and in response, both offices decided to sponsor an interdisciplinary internship starting in the Fall of 2019 to collect data related to pesticide use on campus.

**FIGURE 1.** (Top) Students sitting on grass during 2019 Labor Day weekend regardless of yellow signs warning of recently chemically treated lawn. Photo Credit: Katie Goodale. (Bottom) Students walking on the Pentacrest in 1990 near lawn with yellow sign warning students to keep off. Photo Credit: Randy Bardy



## SCOPE AND GOALS OF THIS REPORT

With the health and safety of the UI community at the forefront, this report was created to increase awareness and provide transparency about the types and amounts of pesticide products being applied across the UI campus. This report does not provide alternative options for any products used nor does it make any claims about potential risks and benefits from any of the applications. This report focuses on lawns serviced by various UI operations and uses data provided by and collected from different lawn chemical applicators. Any limitations are noted in the methodology.

The overall goals of this report are:

- 1. Determine the types, amounts and application locations of different chemical pesticides and fertilizer used on the UI campus grounds.**  
The data collected for pesticides are compared for each commercial applicator based on:
  - 1. Acid Equivalent:** This is the theoretical yield of a parent acid from a pesticide active ingredient that has been formulated as a derivatives e.g. esters, salts, amines.
  - 2. Function:** This is a classification of pesticides based on the targeted pest species. Functions include but are not limited to herbicide, insecticide, and fungicide.
- 2. Identify opportunities to establish and standardize best practices regarding pesticide use, information distribution, and stakeholder relations.** All stakeholders related to this project can help pave the path for the University of Iowa to provide the campus environment that students deserve. Any recommendations are based on practices by other schools, goals set by the state of Iowa, and those presented by collaborators in this project

# COMMITMENT TO PUBLIC AND ENVIRONMENTAL HEALTH

CHEEC and OSE both have distinct, but interrelated, missions that strive to improve and protect public and environmental health. CHEEC focuses on research and education regarding environmental contamination and associated human health effects. OSE's mission is to challenge and inspire the UI community in striving for excellence in systems-based solutions for the grand environmental challenges of the 21st century through impactful transdisciplinary education, research, and service.

## CHEEC

CHEEC was established by mandate within the 1987 Iowa Groundwater Protection Act with the mentioned mission. CHEEC focuses on developing and maintaining environmental databases communicating health information to the general public, cooperating and collaborating on community-engaged programs and projects, and providing environmental health expertise on state and local committees. CHEEC is comprised of faculty from UI Departments of Civil and Environmental Engineering, Epidemiology, Occupational and Environmental Health, Chemistry, Geographical and Sustainability Science, and the State Hygienic Laboratory. This project was made possible through their ongoing Education, Outreach, and Engagement efforts.

## OSE

OSE's mission is to challenge and inspire the greater University of Iowa community—through impactful transdisciplinary education, research and artistry, and public engagement—to strive for excellence in creating and maintaining systems-based solutions for the grand environmental challenges of the 21st century. OSE provides a base for coordinating sustainability-and environment-related programs across the university community, including sustainability education and research. OSE support's connections among existing academic programs, faculty research, and outreach efforts, as well as the coordination of initiatives for a more sustainable community. OSE's goals include building and improving partnerships that work towards a sustainable Iowa, advocating for changes to enhance operations to adapt and combat the effects of human-induced climate change, promote OSE and OSE partner advancements in use-inspired research, and assisting in creating and promoting student opportunities. This project is part of their efforts in Student Life, Outreach, Research, and Campus engagement.

## 2030 SUSTAINABILITY GOALS

On May 2020, the OSE announced the framework for campus-wide sustainability goals to be met by 2030. One of the goals includes using the campus a "living laboratory" for sustainability education and exploration. In this goal, the UI will develop goals to increase opportunities for students and researchers to use the UI campus as an educational and research laboratory for improvement of campus sustainability and ecosystems. This could reasonably include implementing recommendations made in this report.

# METHODOLOGY

## OVERVIEW

Pesticide use information was obtained directly from UI applicators (see below) and was recorded in a Microsoft Excel spreadsheet that served as a chemical inventory to perform calculations related to pesticide application.

## DATA SOURCES

The data sources collected were from calendar year 2018. Applicators considered for this project had to be employed or contracted by the University of Iowa or any of its units, departments, or offices to provide lawn care to facilities or grounds essential to major University of Iowa operations.

According to Iowa Code, a commercial applicator refers to a person, company or employee of a person or corporation that in some form or another applies pesticide on property or land for another entity as a business. This definition does include exceptions for farmers and their employees. To distinguish between the companies and the individuals, this report refers to commercial applicators as those departments and businesses that are in contract with the University to provide lawn care. Individuals who are certified and authorized to use any pesticide will be referred to as certified applicator as per Iowa Code. Pesticide and fertilizer usage data for this report was provided by the following commercial applicators:

### Commercial Applicators

UI Landscaping Services is a branch of Facilities Management for the main campus led by Scott Gritsch. The landscaping services team, composed of over 40 employees, oversees the turf program, flower bed installation and maintenance, litter and waste removal, and snow and ice removal. This team is composed of people with different backgrounds in forestry, horticulture, and landscape design. They are responsible for 290 acres of maintained turf, 8,000 trees, and many miles of sidewalks, bike paths, and roads. For the past 11 years, Landscaping Services has earned the honor of Tree Campus USA Award. This award is given to campuses that have a campus tree advisory committee, a campus tree-care plan, a campus tree program with dedicated annual expenditures,

an annual Arbor Day Observance, and a service-learning project to engage the student body (15). In 2018, UI Landscaping Services released its Landscape Services Management Plan. The plan was created in order to define appearance expectation, establish standards for maintenance and provide a structure for monitoring results (16). The plan also included information about the services areas, rate of application for chemicals in 2018 turf program and maps detailing the areas served by Landscaping Services, and their priority designation. Note that the turf program in the plan is subject to change throughout the years based on new information, environmental conditions, goals, and budgets.

**UI Athletic Grounds** oversees athletic grounds under the University of Iowa Athletics Department.



**FIGURE 2.** UI Landscaping Services Tree Crew receiving their 9th Tree Campus USA award in at the 28th Annual Community Forest Awards Luncheon in Des Moines in 2018. Photo source: UI landscaping Services Facebook.

**Quality Care-The Nature Company** is contracted out by the University of Iowa Housing and Dining unit to perform lawn care, landscape and pond maintenance, and snow and ice removal. Thus, their services are used year-round.

Lawn chemical applicators whose data were requested but were not received in time to be included in this report include:

- (1) University of Iowa Facilities Management at Oakdale
- (2) Jan’s Lawn Care contracted by Heritage Property Management
- (3) The University of Iowa Hospital and Clinics main campus

**LOCATIONS**

This inventory reports 2018 pesticide and fertilizer applications for the applications listed in **Table 1**.

**TABLE 1. LOCATIONS SERVICES BY THE APPLICATORS MENTIONED IN THIS REPORT IN 2018a,b**

<b>HOUSING FACILITIES</b>	<b>RECREATIONAL AND ATHLETIC FACILITIES</b>	<b>LEARNING FACILITIES</b>	<b>SERVICES FACILITIES</b>	<b>OPEN SPACES</b>
Burge Residence Hall	Beckwith Boathouse	Alder Journalism and Mass Communication Building	Hancher Auditorium	Pentacrest
Catlett Hall Residence Hall	Campus Recreation and Wellness Center	Becker Communication Studies Building	Iowa Memorial Union (IMU)	Quad Ravine/ Skunk Hollow
Currier Residence Hall	Elliot Park	Biology Building	Iowa Memorial Union Parking Ramp	
Daum Residence Hall	Field Hockey	Boyd Law Building	Landscape Services Complex	
Hillcrest Residence Hall	Field House	Calvin Hall	Mossman Business Services Building	
Mayflower Residence Hall	Gerdin Athletic Learning Center	Dental Science Building	University of Iowa Aircare Maintenance Facility	
Petersen Residence Hall	Gibson Square Park	English Philosophy Building	University of Iowa Health Care-Iowa River Landing	
President’s Residence	Hansen Football Performance Center	Iowa Advanced Technology Laboratories	University of Iowa Research Park	
Rienow Residence Hall	Hubbard Park	Main Library		
Slater Residence Hall	Kinnick Stadium	Nursing Building		
Stanley Residence Hall	University of Iowa Athletics Hall of Fame	Obermann Center for Advanced Studies		
		Pappajohn Business Building		
		Seamans Center		
		Seashore Hall		
		Theatre Building		
		Wendell Johnson Speech and Hearing Center		

a Locations excluded from the applicators mentioned in this report include: (1) UI Finkbine Golf Course and Clubhouse overseen by UI Athletics Grounds and UI Parking & Transportation Facilities overseen by Landscaping Services, except the IMU Parking Ramp.

b Locations overseen by lawn applicators whose datasets are not present are unknown.

## DATA TYPES

### Pesticide and Fertilizer Usage Data

Pesticide and fertilizer usage data was collected directly from the commercial applicators identified above. Recordkeeping of pesticide and fertilizer applications is mandatory by state and federal law. Currently, none of the UI applicators in this report use restricted use chemicals. Data collected from each applicator included some or all the following information:

- Name of commercial product
- Date of application
- Cost per application
- Location of application
- Rates per area
- Quantities applied
- Purpose of application
- Tools used for application

### Safety Data Sheets and EPA Approved Label Sheets

Safety data sheets and EPA Approved Label Sheets were obtained from the manufacturer websites, distributors, and EPA's Pesticide Product and Label System. Safety Data Sheets (SDS), also known as material safety data sheets and product safety data sheets, provide basic information of a chemical product such as the properties of each chemical; the physical, health, and environmental health hazards; protective measures; and the safety precautions for handling, storing and transporting the chemical (7). EPA Approved Label Sheets are documents that the EPA must approve under FIFRA that contain information regarding the conditions, directions and precautions needed to apply the pesticide (18).

### Quantity and Use Calculations

In this report two different values related to pesticide quantities are discussed: total commercial product and total acid equivalent. Total commercial product refers to the total amount of product that contains both active and inert ingredients. Most applicators apply based on the actual commercial product. However, this can be converted to acid equivalent or even active ingredient quantities.

Total acid equivalent refers to the total amount of the parent acid from a pesticide active ingredient in a commercial product. Though the term active ingredient is more common, acid equivalent is more informative about the quantities of the action portion of an active ingredient that binds to the target site of the pest (19).

Active ingredients can be found in dry and liquid pesticide formulations (20). Usually, in dry formulations ingredients are measured in percentage active ingredient by weight of product, while in liquid formulations the active ingredient is measured in pounds per gallon. Regardless, the total active ingredient is described in terms of pounds (20). The same applies to acid equivalent quantities. It is important to note that there are different formulations for pesticides and fertilizers. The applicators listed in this report use liquid and dry formulations.

This report will report acid equivalent totals in pounds including those that are a liquid formulation as per standards. However, total commercial products are reported in units based on their actual formulation. Pounds and gallons are used for dry and liquid formulations, respectively.

# RESULT DETAILS

This inventory reports pesticide and fertilizer applied by Athletic Grounds, Landscaping Services, and Quality Care in 2018 to areas deemed essential for administrative, operational, and student services. We acknowledge that pesticide application protocols, including the type and amount of chemicals applied, may have changed since 2018. In some cases, more area may not be treated by pesticides. For example, Mayflower Residence Hall was under construction in 2018 and did not receive any lawncare treatment or landscape maintenance from Quality Care. As such, these numbers may not be reflective of current use or practice.

## 2018 OVERVIEW

### Pesticide Usage by Function and Commercial Product

Total commercial product in this report refers to the total amount of pesticide used regardless of the amount of diluted pesticide solution that is applied to grounds. For example, data collected by Athletic Facilities contains the amount of pesticide used per gallon or tank of water. A solution can call for 640 ounces of pesticide per 300 gallons of water. The 300 gallons of water are then sprayed in various areas depending on the total area treated. However, in calculating pesticide usage total we are only looking at quantifying the 640 ounces of pesticide in the solution.

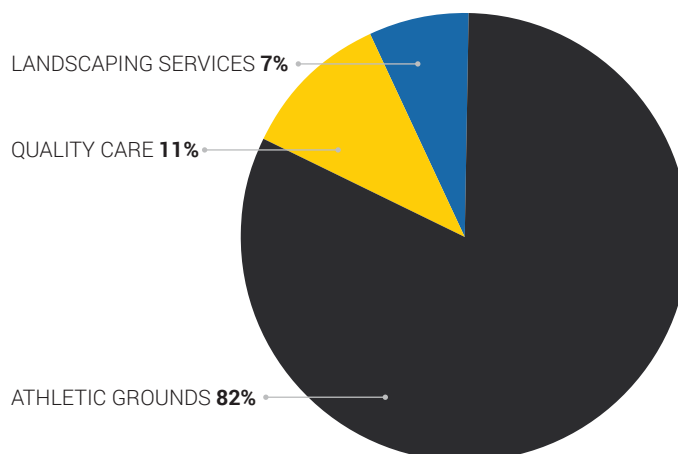
**TABLE 2. TOTAL COMMERCIAL PRODUCT (GALLONS) BY FUNCTION APPLIED BY EACH APPLICATOR**

FUNCTION	ATHLETIC GROUNDS	LANDSCAPING SERVICES	QUALITY CARE
Herbicide	22	3.3	5.5
Fungicide	19	-	-
Insecticide	4.5	-	-
<b>Total</b>	<b>39.5</b>	<b>3.3</b>	<b>5.5</b>

Most of the pesticides applied on campus were applied in liquid form except for those mixed with solid fertilizer. Pesticide quantities mixed with fertilizer are calculated separately. Pesticide quantities from these mixed chemicals are discussed in the individual subsections associated with each applicator found below because pesticides are usually in the form of their parent acid form in these formulations. **Table 2** includes the chemicals categorized by function and the amount applied, with the greatest use by Athletics Grounds. As

shown in **Table 2**, Athletic Grounds, Landscaping Services and Quality Care used a total of 22, 3.3, and 5.5 gallons of herbicides, respectively. Additionally, Athletic Grounds used 19 and 4.5 gallons of fungicide and insecticide commercial products, respectively. Use information from other UI applicators was not provided in time for completion of this report.

As shown in **Figure 3**, in 2018, the 39.5 gallons of pesticides used by Athletic Grounds accounted for 82% of all liquid pesticides applied on campus. This should be expected



**FIGURE 3.** Percent contribution of total commercial pesticides applied in 2018

given the higher standard of care required to host and maintain intercollegiate athletic activities at UI. About 11% of the pesticides were applied by Quality Care. In the same year, Landscaping Services applied 7% of the total pesticides applied by three applicators.

The manufacturer and product names of the pesticide commercial products used in 2018 by applicators were:

- BASF Drive XLR8
- BASF Lexicon
- BASF Trinity

- Bayer Banol Fungicide
- Nufarm Cool Power
- Nufarm Horsepower
- Nufarm Millennium Ultra 2
- Nufarm Razorburn
- Nufarm Stellar Fungicide
- Nufarm Sureguard SC
- PBI Gordon Vessel

**TABLE 4. POUNDS OF ACID EQUIVALENT APPLIED ON CAMPUS GROUNDS IN 2018 FOR SELECT UI APPLICATORS**

		ATHLETIC GROUNDS	LANDSCAPING SERVICES	QUALITY CARE	
Acid Equivalent	Function	# of Pounds applied			Total
Chlorothalonil	fungicide	77.2	-	-	<b>77.2</b>
Glyphosate	herbicide	56.0	-	-	<b>56.0</b>
2,4-D	herbicide	17.8	-	10.5	<b>28.3</b>
MCPA	herbicide	-	10.3	2.9	<b>13.2</b>
Propamocarb hydrochloride	fungicide	6.5	-	-	<b>6.5</b>
Quinclorac	herbicide	4.5	-	0.3	<b>4.8</b>
Pyraclostrobin	fungicide	4.6	-	-	<b>4.6</b>
Dicamba	herbicide	2.2	1.0	1.2	<b>4.4</b>
Triticonazole	fungicide	2.9	-	-	<b>2.9</b>
MCPP or Mecoprop	herbicide	-	-	2.8	<b>2.8</b>
Fluxapyroxad	fungicide	2.3	-	-	<b>2.3</b>
Prodiamine*	herbicide	-	1.6	0.5	<b>2.1</b>
Mesotrione	herbicide	1.4	-	0.6	<b>2.0</b>
Diquat	herbicide	2.0	-	-	<b>2.0</b>
Triclopyr	herbicide	-	1.0	0.3	<b>1.3</b>
Dithiopyr*	herbicide	-	-	1.1	<b>1.1</b>
Imidacloprid*	insecticide	-	-	1.1	<b>1.1</b>
Clopyralid	herbicide	1.1	-	-	<b>1.1</b>
Chlorantraniliprole (rynaaxypyr)	insecticide	0.8	-	-	<b>0.8</b>
Acibenzolar-S-methyl	fungicide	0.2	-	-	<b>0.2</b>
Fluopicolide	fungicide	0.2	-	-	<b>0.2</b>
<b>Total</b>		<b>179.5</b>	<b>13.9</b>	<b>21.2</b>	<b>214.6</b>

\* These chemicals were part of a fertilizer and pesticide mix. These quantities were calculated separately using the acid equivalent rates.

- PBI Gordon Surge
- Prime Source Prodiamine 4SC Select
- Syngenta Acelepryn
- Syngenta Daconil Action
- Syngenta Tenacity
- Winfield United Cornerstone Plus

All the products listed above are non-restricted use pesticides based on comparison to the EPA’s list of restricted use pesticides. Since all three applicators take care of areas with different functions, few of the commercial products are used by more than one of the applicators.

**Pesticide Usage by Acid Equivalent**

A commercial product can contain the same active ingredient as another commercial product. Because commercial product ingredients vary in composition and form, acid equivalent data was used to better compare use across all three applicators. This allows comparison that accounts for different forms of the active ingredient in the commercial products used by different applicators.

**Table 4** lists the number of pounds of pesticide active ingredients as acid equivalents used by Athletics Grounds, Landscaping Services, and Quality Care in calendar year 2018. Use information from other UI applicators was not provided in time for completion of this report. Also provided in **Table 4** is the function of each active ingredient (herbicide, fungicide or insecticide), and the cumulative amount of pesticide active ingredient used by each of the three applicators. Note that the

**TABLE 5. TOTAL PRODUCT APPLIED (LBS) OF MIXED FERTILIZER AND PESTICIDE COMMERCIAL PRODUCTS**

COMMERCIAL PRODUCT	TOTAL PRODUCT APPLIED (LBS)
Award 15-0-5 with 0.37% Prodiamine	125
DK & P 15-0-3 0.125% Dimensions 25% RXN	887
Green Yard 20-0-3 100% STN 0.2 Mallet	560

list of pesticide active ingredients in **Table 4** are arranged from highest to lowest total use across UI.

The most extensively used pesticides at UI in 2018 based were chlorothalonil, a fungicide, and the herbicides glyphosate, 2,4-dichlorophenoxyacetic acid (or 2,4-D) and 2-methyl-4-chlorophenoxyacetic acid (or MCPA). Chlorothalonil and glyphosate use were limited to Athletic Grounds, while 2,4-D and MCPA were used across UI by multiple pesticide applicators. Also used by multiple applicators were quinclorac, dicamba, prodiamine, mesotrion, and triclopyr. In terms of pesticide function, fungicides were only used by Athletic Grounds, herbicides were commonly used across all three applicators, and insecticide use was limited to only two species, including the neonicotinoid imidacloprid. Quality Care was the only applicator to use solid fertilizer with pesticides. **Table 5** lists the names of the three mixed fertilizer and pesticide products and the total pounds applied of each one.

These products were applied as granular form. Their labels contained the acid equivalent or active ingredient measurements as a rate of pound per pound, thereby allowing the amount of active ingredient applied in 2018 to be determined. Active ingredients originating from these mixed commercial products are noted in **Table 4**.

# RECOMMENDATIONS AND NEXT STEPS

## RECOMMENDATIONS

1. **Update UI Operations Manual or Policy regarding pesticide use on campus**
2. **Adopt an Integrated Pest Management Plan with Appropriate Oversight Committee**
3. **Join PESP, PGMS or comparable organizations that promote efforts to reduce pesticide risk and usage.** The Pesticide
4. **Reconstitute the UI Pesticide Task Force**
5. **Develop and Maintain a UI Pesticide Use Inventory**
6. **Publicly Facing Website Dedicated to Disseminating Information on UI Pesticide Use**
7. **Improve Notification and Alert System for Applications**
8. **Convert Unused or Low Foot Traffic Turf to Native Lawn**

The following table includes a list of recommendations, best practices and community resources that were informed through the preparation of this report, and influenced by practices at peer institutions, OSE and CHEEC collaborators, and state and federal environmental goals.

## RECOMMENDATIONS

**1. Update UI Operations Manual or Policy regarding pesticide use on campus**  
UNI and the University of Wisconsin-Madison have formal institution-wide policy regarding pesticide use on campus and make an official statement regarding the implementation of an integrated pest management (IPM) plan to prevent using pesticides or other chemicals, if deemed unnecessary.

### **2. Adopt an Integrated Pest Management Plan with Appropriate Oversight Committee**

Currently, only UI Landscaping Services has developed a cohesive and publicly available Landscape Services Management Plan. All UI applicators, both internal and external, should adopt comparable, publicly available plans aligned with Integrated Pest Management (IPM). The US EPA encourages use of Integrated Pest Management (IPM) as an “environmentally friendly, common sense approach” that prioritizes pest prevention and using pesticides only as needed (21). According to the EPA, IPM is “not a single pest control method but rather involves integrating multiple control methods based on site information obtained through inspection, monitoring, and reports (21)”. EPA recommend a four-tier IPM approach based on (i) identifying pests and monitoring progress; (ii) setting action thresholds; (iii) prevention; and (iv) control (21). As an example, Penn State University has two IPM Committees that oversee separate IPM plans for indoor pests and landscape pests. UI would benefit from the formation of a similar committee to develop an IPM plan for Iowa and provide ongoing evaluation of pesticide practices at UI. The committee should include, but not be limited to, representatives from all UI applicators and other relevant stakeholders.

**3. Join PESP, PGMS or comparable organizations that promote efforts to reduce pesticide risk and usage.** The Pesticide Environmental Stewardship Program (PESP) is an EPA partnership program that works with pesticide applicators—private, commercial, and general-use pesticide users—to promote IPM practices. This program was created to reduce pesticide risk more efficiently and to a greater extent using the informed actions of pesticide

## RECOMMENDATIONS

**1. Update UI Operations Manual or Policy regarding pesticide use on campus**

**2. Adopt an Integrated Pest Management Plan with Appropriate Oversight Committee**

**3. Join PESP, PGMS or comparable organizations that promote efforts to reduce pesticide risk and usage.** The Pesticide

**4. Reconstitute the UI Pesticide Task Force**

**5. Develop and Maintain a UI Pesticide Use Inventory**

**6. Publicly Facing Website Dedicated to Disseminating Information on UI Pesticide Use**

**7. Improve Notification and Alert System for Applications**

**8. Convert Unused or Low Foot Traffic Turf to Native Lawn**

users in addition to the government regulations that already exists to reduce pesticide risk. Over 250 nationally recognized organizations have joined the PESP program. PESP offers many benefits to its members including help with creating IPM programs.

Similarly, the Professional grounds Management Society (PGMS) is a society that focuses on uniting professional grounds managers to promote the sharing of materials and reliable information to execute grounds management function while attaining and maintaining a high standard of business ethics. PGMS sponsors the Green Star Award program which serves to nationally recognize grounds maintained with a “degree of excellence,” individual professional efforts, and challenge other responsible for ground maintenance to achieve a higher level of excellence. The categories in which members are graded on include: turf management, landscape, safety, challenges, budget, and sustainable practices. The following Big Ten schools have been or are members of PGMS: University of Nebraska-Lincoln, University of Maryland, Penn State, University of Minnesota-Twin Cities, Purdue University and the University of Wisconsin. Joining PGMS would allow for a better comparison of the management, strategies, and aesthetics between the University of Iowa and other Big 10 universities. Additionally, benefits including (i) help in developing IPM strategies; (ii) funding opportunities to support strategy implementation; (iii) professional development and continued education for ground maintenance crew members; and (iv) national recognition to grounds management program.

### **4. Reconstitute the UI Pesticide Task Force**

As mentioned, a pesticide task force once existed at the University of Iowa. This task force should be revitalized to provide stakeholder input on pesticide use on campus. Such a task force could include representatives from UI student government, sustainability focused student groups, and representatives of offices including OSE and CHEEC, among others. The Task Force could interact with and provide feedback to the IPM Committee, while also help promote dissemination of relevant information to community members and other UI stakeholders.

### **5. Develop and Maintain a UI Pesticide Use Inventory**

A pesticide or lawn chemical use inventory should be maintained and updated periodically (e.g., every two years). This inventory would promote transparency and help inform the UI community of pesticide use on campus lawns. There are potential benefits to UI applicators including increased data sharing and implementation of best practices across applicators. Developing such an inventory would also require standardizing collection and archiving of data related to the types and amounts of pesticide used by all applicators at UI. This would help overcome the largest challenge (e.g., limited and highly variable pesticide data availability and format) revealed through the compiling of this report.

## RECOMMENDATIONS

**1. Update UI Operations Manual or Policy regarding pesticide use on campus**

**2. Adopt an Integrated Pest Management Plan with Appropriate Oversight Committee**

**3. Join PESP, PGMS or comparable organizations that promote efforts to reduce pesticide risk and usage. The Pesticide**

**4. Reconstitute the UI Pesticide Task Force**

**5. Develop and Maintain a UI Pesticide Use Inventory**

**6. Publicly Facing Website Dedicated to Disseminating Information on UI Pesticide Use**

**7. Improve Notification and Alert System for Applications**

**8. Convert Unused or Low Foot Traffic Turf to Native Lawn**

### **6. Publicly Facing Website Dedicated to Disseminating Information on UI Pesticide Use**

The University of Wisconsin-Madison has created reports similar to this one since 2013, and they are accessible to the public. Similarly, the University of Iowa should provide information regarding pesticide use on campus lawns (e.g., chemical inventories, application schedules and maps, etc.) accessible to the student body and general public through a dedicated uiowa.edu interface.

### **7. Improve Notification and Alert System for Applications**

In Iowa, a prenotification registry maintained by a municipality is an alternative to the public notification specified in the Iowa Administrative Code subrule 45.50 (5). This registry provides notification to individuals in that registry at least 24 hours prior to a pesticide application made adjacent to their property. This registry is updated yearly and made available upon request to commercial and public pesticide applicators. Additionally, an occupant of a property adjoined to lawns, parks, playgrounds, athletic fields, or a golf course can request prior notification of a pesticide application by personally contacting the applicator or anyone else responsible for the application (5). In addition to signs after application, UNI also employs a pre-notification registry to increase awareness of pesticide applications. Those who request inclusion on the UNI registry are notified in advance of pesticide application plans for university grounds, and a simple, web-based data entry form is provided to allow members of the UNI community to be placed on this registry. UI should develop a similar pre-notification registry system for all UI applicators. To increase efficacy of this approach, UI could employ an opt-out strategy (as opposed to voluntary opt-in) to reach a broader segment of the UI student population.

### **8. Convert Unused or Low Foot Traffic Turf to Native Lawn**

Good Neighbor Iowa collaborates with the UNI Conservation Corps to promote community environmental conservation through a turf-to-prairie initiative. They have done work in schools, public parks, childcare centers, institutions and residential areas. As of June 2020, the UI Environmental Coalition has begun to work with Good Neighbor Iowa to achieve a pesticide-free campus.

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