

City of Edmonton

Edmonton

## Pesticide Usage Report 2022/2023/2024/2025

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## Executive Summary

Integrated Pest Management (IPM) is a comprehensive approach to address urban pest challenges, which encompass public health concerns, sanitation issues and disruptions in various areas. The City of Edmonton adheres to a well-defined framework for pesticide utilization, following federal and provincial regulations as well as its own IPM Policy. The City's IPM Policy is built on the pillars of accountability, efficacy, health & safety, and sustainability.

The trend for pesticide usage in the city has been increasing slightly in recent years, primarily due to dry conditions causing stress in many plants, and leading to the proliferation of regulated weed species. However, the overall trend over time is towards a decrease in the use of pesticides.

IPM aims to strike a balance between effective pest management and minimal risks to human health and the environment. It focuses on proactive measures to prevent pest issues but also utilizes pesticides when necessary. The City is transitioning from conventional pesticides to reduced-risk and biorational alternatives, which are pesticides derived from natural sources such as bacteria, or fungi. In comparison to conventional pesticides some of these products may require higher dosage to be effective, which may result in increased quantities of active ingredients when compared solely by kilogram to kilogram.

The City primarily uses pesticides for specific purposes, including antimicrobials for water quality, insecticides for mosquito control, and herbicides for turf maintenance and regulated weed management. Other pesticide categories, such as fungicides and rodenticides, contribute minimally to overall pesticide use.

The IPM programs in the City of Edmonton employ various products and techniques, such as biological larvicides for mosquito control and systemic trunk injections for tree pest management. These programs aim to mitigate pest populations and protect the urban forest canopy.

## City of Edmonton: Integrated Pest Management

*Pesticides are products used directly or indirectly to control, destroy, attract or repel a pest to mitigate or prevent injurious, noxious or troublesome effects.*

*Herbicides target unwanted plants, such as noxious and prohibited noxious weeds regulated under provincial legislation.*

*Insecticides target insects such as biting flies, yellowjackets, or pests that threaten the urban forest such as bark beetles or scale insects.*

*Fungicides target fungus that grow in moist conditions, and threaten turf or trees.*

*Rodenticides target vertebrate pests like pocket gophers, ground squirrels or mice that do damage to city infrastructure.*

*All pesticides used by the City of Edmonton are registered with Health Canada, and applied under supervision of licensed applicators.*

Integrated Pest Management (IPM) employs various tools to address the rising challenges posed by urban pests. While pesticides play a role, they are just one component of a comprehensive approach. Urban pests give rise to a range of problems, encompassing public health concerns, sanitation issues, and general disruptions. They can also compromise public utility services, invade buildings and facilities, impact the urban forest and green infrastructure like sports fields and golf courses, and cause harm to the city's natural biodiversity and ecosystems. IPM acknowledges these multifaceted pest-related issues and employs a diverse set of strategies to effectively manage them.



### The Cycle of Integrated Pest Management

- Identification: Required to ensure that what is observed is truly a pest, and that the prevention or intervention is matched with the biology of that species



Purple loosestrife

*Purple loosestrife is a semiaquatic invasive species that replaces native vegetation in wetlands, disrupting habitats and water quality*



Spongy moth

*The egg masses of the invasive defoliator, spongy moth, **Lymantria dispar**, can be laid on any surface such as train cars, motorhomes or goods being shipped. This can lead to introductions of the moth to new locations.*

- Prevention: Reducing or eliminating the conditions under which a species can become a pest. In some cases a strategic application of pesticides can act as a prophylactic or repellent, keeping the population from ever reaching the pest condition
- Observation: Regular scouting and monitoring to track populations and distribution of species that may become pests. Pesticides are sometimes used in this stage as part of the collection of species in traps, or attracting pests to traps
- Intervention: Taking action against a pest once it has reached an action threshold. Pesticides are one important tool once intervention becomes necessary, and are often the most effective and safest method
- Evaluation/Assessment: Reviewing the results to see what worked, what didn't, and adjusting the plan for the future

The City's use of pesticides adheres to a well-defined framework compliant with federal regulations governing product registration and safety across Canada, provincial regulations imposing sales and application restrictions in Alberta, and the City's Integrated Pest Management Policy (501A), which received Council's approval in July 2019. The underlying principle uniting these various policy layers is the implementation of an Integrated Pest Management (IPM) approach, ensuring the controlled and strategic use of pesticides.

IPM is about effective, knowledge-based and responsible pest management options with minimal risk to human health and the environment. The City's IPM Policy is built on the four pillars of Accountability, Efficacy, Health & Safety, and Sustainability.

As part of the commitment to Accountability, this report details some of the trends, products used, and categories of usage for pesticides in the 2022-2025 seasons. This includes all uses of pesticide by City employees.

*Pesticide usage is reported in kilograms of active ingredient.*

*The active ingredient is the component of a pesticide formulation responsible for its ability to control the target pest.*

*Some products have more than one active ingredient.*



White cockle

*Listed in Alberta Weed Control Act as a noxious weed, white cockle is a fragrant plant with five deeply notched petals. It invades disturbed areas, roadsides and farmland.*

## City of Edmonton Pesticide Usage

Integrated Pest Management (IPM) aims to strike a balance between the most effective and sustainable pest management practices while minimizing risks to health, safety, and the environment. Ideally, the focus is on proactive measures that prevent pest issues before they escalate into outbreaks. However, there are instances where direct intervention becomes necessary. In such cases, the goal is to select the appropriate method, targeting the pest at the right time and location, particularly during its most vulnerable life stage, utilizing the most effective tool available. This may occasionally involve the careful application of pesticides. By employing these strategies, IPM often leads to a reduction in overall pesticide usage, although it should be noted that seasonal rates of pesticide use can be influenced by various factors. While decreasing pesticide usage is an overarching objective of the IPM program, it should not be the sole metric for determining its success, considering the multifaceted nature of pest management and the diverse interconnected factors involved.

While conventional pesticides offer high potency at low concentrations, their broad-spectrum toxicity poses significant risks to non-target species. In contrast, biorational alternatives prioritize ecological selectivity but frequently demand higher application volumes and more frequent dosing due to their limited residual activity. Consequently, as the City shifts toward these reduced-risk options, the total volume of active ingredients used—measured by weight—is expected to rise.

Seasonal fluctuations play a significant role as well. Mosquito populations, in particular, are strongly influenced by precipitation during spring and summer. Years with above-average rainfall and warmer temperatures lead



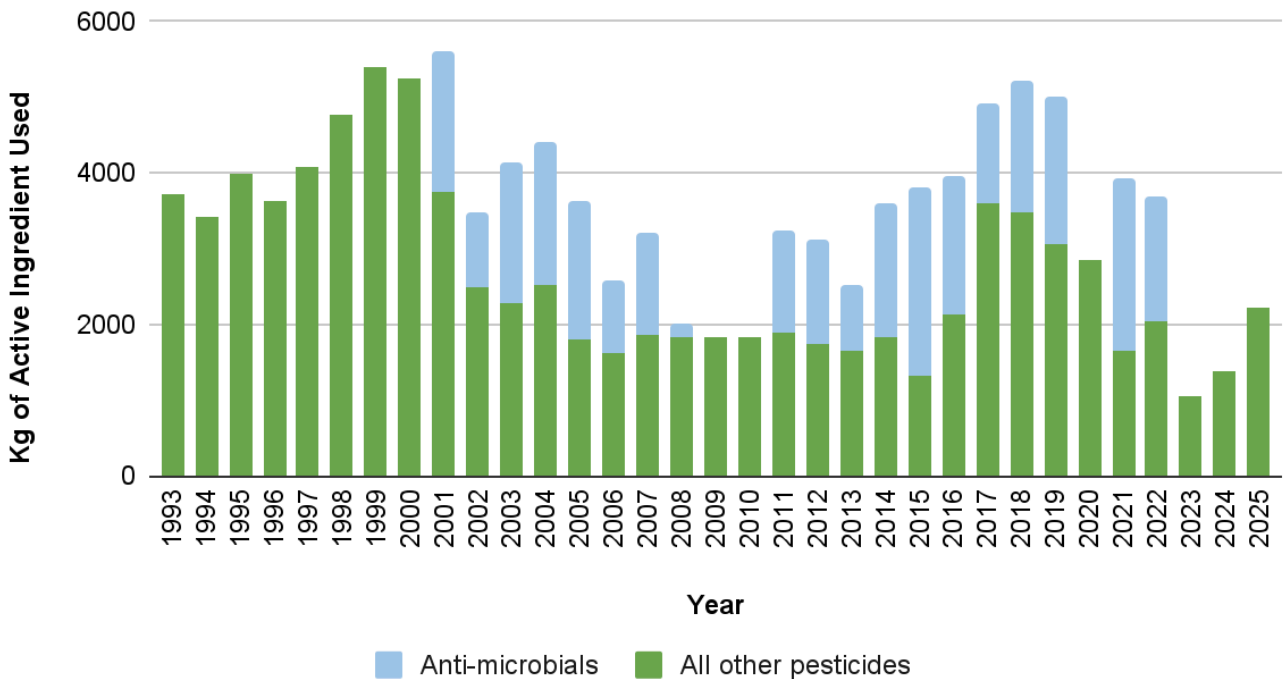
*Phragmites australis*

*This invasive reed can grow up to 4 metres tall. It grows in shallow water and outcompetes native plants*

to increased mosquito activity, necessitating greater application of larvicides to control their populations effectively.

In the case of cyclical pest species outbreaks or the introduction of invasive species, especially regulated ones like noxious or prohibited noxious weeds, prompt action is crucial to prevent their establishment. Often, pesticide application is necessary to address these situations and mitigate their impact.

**Fig. 1 City of Edmonton Pesticide Use 1993-2025**



*Average use of sodium hypochlorite in Hawrelak for water treatment = 1,500 kg/yr*

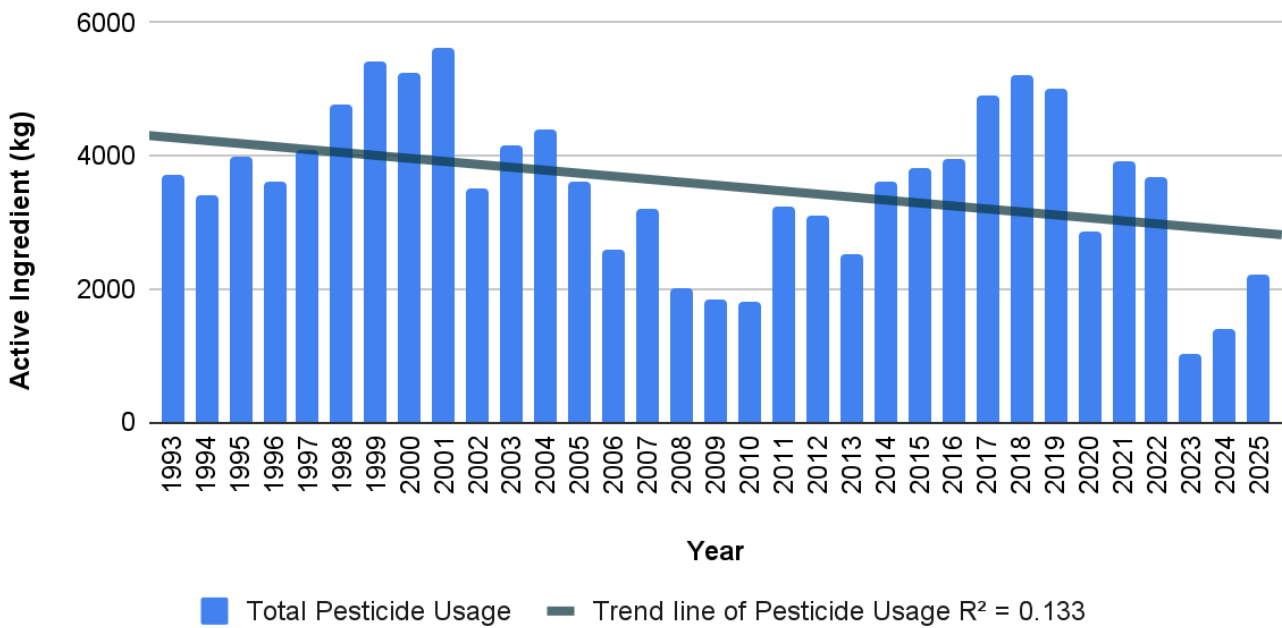
*Average use of sodium hypochlorite by EPCOR for drinking water = 250,000 kg/day*

The general trend for the 2021-2025 period has been for decreasing pesticide use.

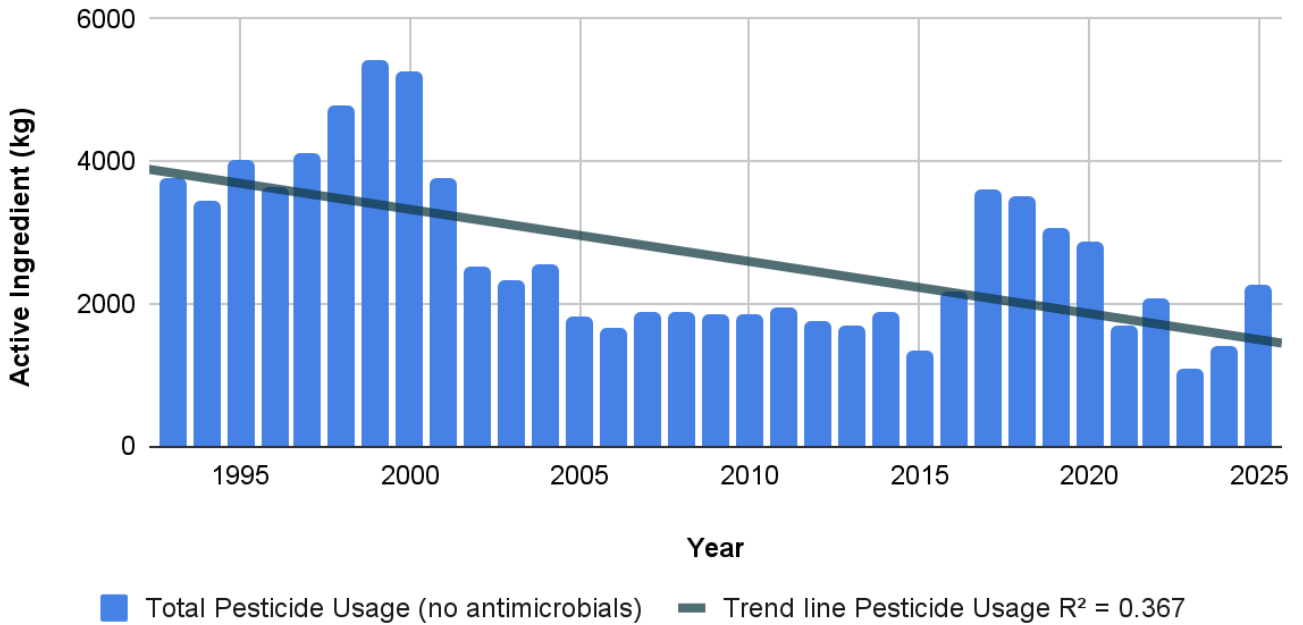
The largest use of pesticides in 2021 and 2022 was for antimicrobials for management of water quality in conjunction with water quality events in Hawrelak Park. These events did not take place in 2023-2025 as the park underwent renovations and rehabilitation.

2023 saw the lowest quantity of pesticides used by the City of Edmonton on record.

**Fig. 2 Trend of Pesticide Usage by City of Edmonton 1993-2025**



**Fig 3. Trend of Pesticide Usage (no antimicrobials) 1993-2025**



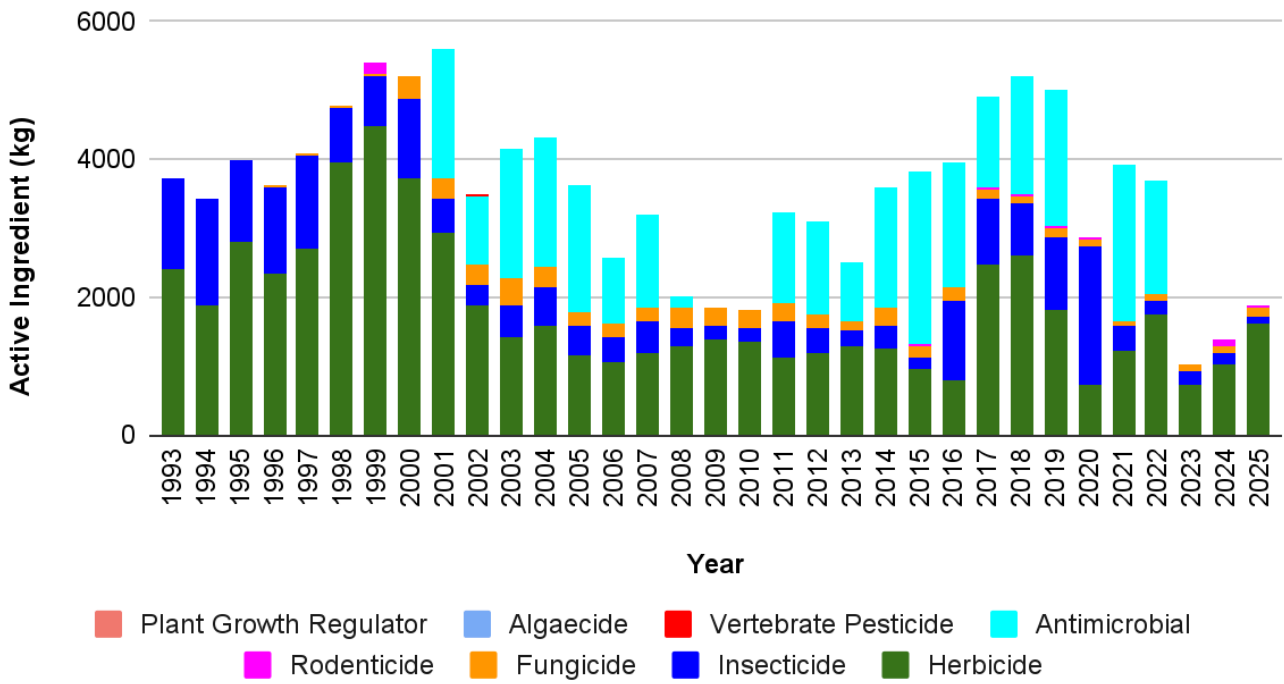
**Orange hawkweed**

*Native to Europe, Orange hawkweed invades grasslands and forms dense mats of rosettes that prevent other plants from growing. It is considered prohibited noxious under Alberta Weed Control Act.*

When the antimicrobial products are removed from the graph, the trend towards reduction of pesticide usage is more pronounced. This trend is maintained even with a shift to more bio-rational products that require applications of higher quantities to achieve efficacy.

Although the goal of the Integrated Pest Management policy is to ensure that any pesticide usage is the most environmentally sustainable option rather than a simple reduction of usage, it is always desirable to use the least amount of chemical intervention possible.

**Fig. 4 Pesticide Usage by Category 1993-2025**



Pine false webworm

*Originally from Europe, the pine false webworm is a sawfly, the larvae of which can cause extensive defoliation of multiple pine species. Lightly infested branches can be pruned out, but dense populations may justify chemical treatment.*

Comparing different categories of pesticide usage, in most years antimicrobials used for water contact events account for the highest proportion of usage.

Herbicides are typically the second most used category, followed by insecticides.

## Antimicrobials

For the period from 2001 to 2022, a considerable proportion or even majority of pesticide usage for City of Edmonton operations has been antimicrobials (sodium hypochlorite) used to reduce populations of pathogenic bacteria in conjunction with water contact events in Hawrelak Lake. This generally involves application of such antimicrobials in the week leading up to and during events such as the International Triathlon Union (ITU) World Triathlon Series. This is done to meet Alberta Health Services guidelines and ITU regulations in regards to acceptable levels of bacterial activity, and necessary owing to the shallow depth (~1.5 m) of the man-made 5 hectare pond, and high levels of added organics due to populations of Canada geese and ring-billed gulls around the lake that are artificially supported by park users feeding them, or scavenging excess food.

Across Canada, nearly one-third of all pesticide sales are for antimicrobials, and they made up 98.5% of non-agricultural pesticide sales in 2022 (PMRA, 2022) where they are used for water treatment, including pools and spas, and wood preservation.

Antimicrobials are widely used in the region for treatment of public pools and drinking water treatment, but these uses are not reported here, as they are not done by licensed pesticide applicators. The usage at Hawrelak is reported because it is an unusual application, and special use beyond the standard label directions of the product, and done with consultation with Alberta Health Services, Alberta Environment and Protected Places, and Health Canada’s Pest Management Regulatory Agency.

No application as a special use took place in 2020, as events were cancelled due to COVID-19. Starting in 2022 a Capital Renewal Project shut down Hawrelak Park to address aging park infrastructure and meet future demands. As part of this project, the artificial lake was updated, and is anticipated to mitigate the needs for antimicrobial applications when water contact events return in 2026.

Table 1 - City of Edmonton Antimicrobial Use : Water Quality Program (2022)			
Product Name	Active Ingredient	PCP Number	2022 Active Ingredient Usage (kg)
Hypochlor-12	Sodium Hypochlorite	30754	1648

## Herbicides

Herbicides are pesticides used to manage or eliminate unwanted plants. These include plants that are regulated as weeds under legislation such as the Alberta Weed Control Act (W-5.1).

Under that Act, there are two categories of regulated plants: Noxious weeds require the owner or occupant of any land to control those plants when they occur. Prohibited noxious weeds require the owner or occupant of any land to destroy those plants when they occur.

The City of Edmonton maintains over 4200 hectares of sports field, turf, and open grassland areas, as well as naturalized areas, golf courses, cemeteries, and infrastructure such as along LRT tracks that requires attention to prevent damage or invasion by regulated weeds.

Herbicides are primarily applied by the Integrated Pest Management (IPM) Vegetation Management team. However, Community Services uses herbicides for maintenance at golf courses and attractions.

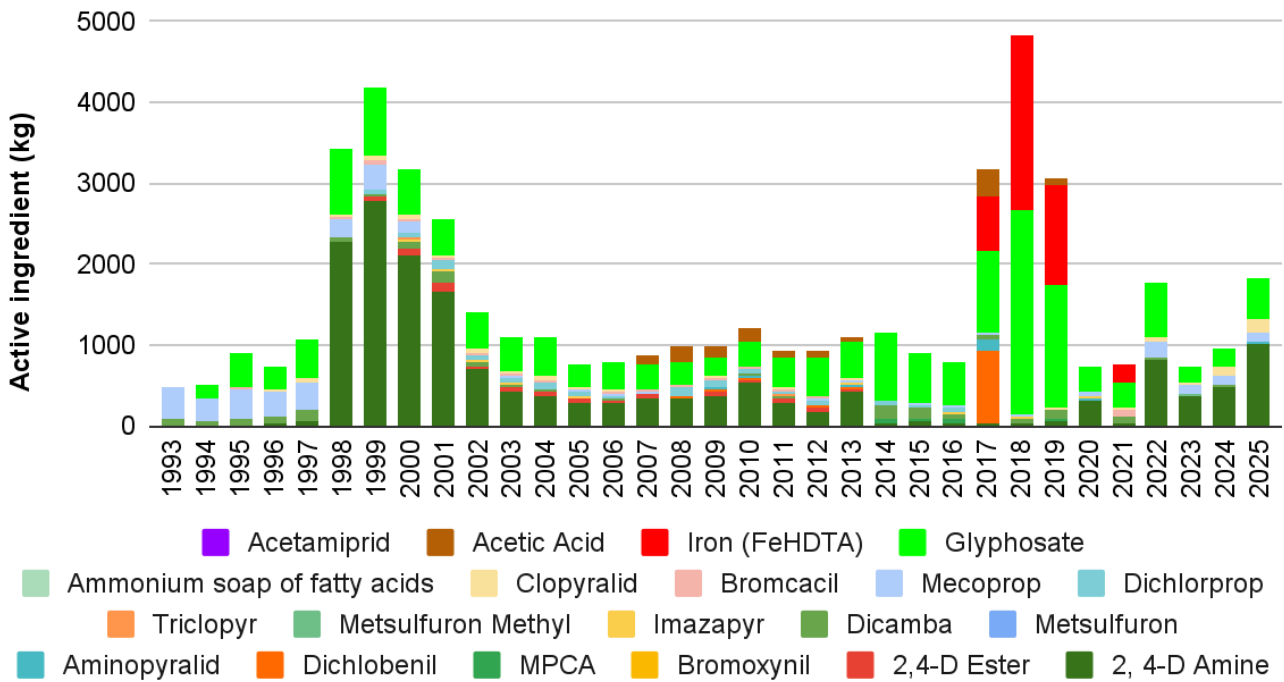
One of the major integrated pest management plans within vegetation management includes the naturalization of passive, mowed turf areas. This will eventually diminish the habitat available for many common weed species. This transition aligns with broader objectives of cultivating healthier, more sustainable, and resilient landscapes that offer long-term environmental benefits. However, during this naturalization process there is a transitional period where the management of non-native vegetation, including weeds, must be intensified to ensure the establishment and development of native species and sustainable ecosystems.

In addition, the expansion of naturalized areas, and reduction of mowing cycles comes with other maintenance and surveillance responsibilities that have an impact on operations. In particular, longer periods between mowing cycles leads to a higher chance of birds nesting in tall grasses which requires more thorough and complex inspections before equipment can operate. In response to these evolving complexities, the City has established a specialized biological surveillance team to enhance and protect Edmonton's natural systems.

**Table 2 - City of Edmonton Herbicide Use: Open Spaces (2022-2025)**

Product Name	Active Ingredient	PCP Number	2022 Active Ingredient (kg)	2023 Active Ingredient (kg)	2024 Active Ingredient (kg)	2025 Active Ingredient (kg)
2,4-D Amine 600 Herbicide	2,4-D Amine	5931	448.0	142.1	249.8	768.0
Clearview Herbicide	Aminopyralid	29752	-	-	-	21.0
	Metasulfuron					3.78
Escort Herbicide	Metsulfuron Methyl	23005	1.3	1.7	-	-
Esplanade SC Herbicide	Indaziflam	31333	-	-	43.3	73.8
Garlon RTU Herbicide	Triclopyr	29334	1.7	0.2	0.5	9.8
Hasten NT Ultra Spray Adjuvant	Methyl and ethyl oleate (esterified vegetable oil)	31760	-	-	39.2	39.9
IPCO Factor 540 Liquid Herbicide	Glyphosate	27988	-	-	-	327.7
Lontrel 360 Herbicide	Clopyralid	23545	-	-	-	0.9
Lontrel XC Herbicide	Clopyralid	32795	56.8	34.6	93.4	166.0
Milestone Herbicide	Aminopyralid	28517	1.0	0.8	-	8.3
Munger Horticultural Vinegar Plus	Acetic Acid	29405	-	8.0	-	-
Nufarm Estaprop XT Liquid Herbicide	2,4-D Ester		1.4	-	-	-
	Dichlorprop		0.7			
Nufarm Trillion Turf Herbicide	2,4-D Amine	27972	306.1	137.5	183.0	55.7
	Dicamba	27972	29.0	13.0	17.3	5.3
	Mecoprop	27972	161.1	72.3	96.3	29.3
Par III Turf Herbicide	2,4-D Amine	27884	40.3	79.6	31.2	-
	Dicamba	27884	3.8	7.5	2.95	
	Mecoprop	27884	21.2	41.9	16.41	
Roundup Transorb HC Liquid Herbicide	Glyphosate	28198	359.5	43.3	0.3	-
Roundup Weathermax with Transorb 2 Technology Liquid Herbicide	Glyphosate	27487	282.7	20.7	155.4	57.1
Roundup WeatherPro	Glyphosate	33653	14.1	135.4	77.6	101.4
WeedAway Premium 3-Way XP	2,4-D Amine	27848	-	-	17.9	156.5
	Dicamba	27848			1.7	14.8
	Mecoprop	27848			9.4	82.4

**Fig. 5 Herbicide Use in Parks and Open Spaces 1993-2025**



**Herbicide Spotlight: Indaziflam**

Indaziflam is a long-lasting pre-emergent herbicide used in products such as **Esplanade SC Herbicide**, ideal for managing tough weeds and unwanted growth in specific areas. It inhibits the biosynthesis of cellulose in developing plants. Essentially, it prevents the formation of cell walls in germinating seeds. Affected plants fail to emerge or die shortly after germination. As it targets the structural “skeleton” of the plant while it is still in the formative stages, it is exceptionally effective at low use rates.

Indaziflam also has exceptional longevity. It binds tightly to soil particles, and a single application can provide inhibition of plant growth for 6 to 12 months. This significantly reduces the need for multiple applications, and also minimizes the leaching of the product into surrounding soil or groundwater, keeping it in the germination zone within the top layer of soil where it was applied.



*In some areas any species of plant can be a safety issue.*

These properties make indaziflam an ideal preventative to keep any plants from sprouting in areas such as along LRT tracks where any vegetation can cause issues with security, structural integrity, and fire risk.

#### Herbicide Spotlight: Methyl and ethyl oleate (esterified vegetable oil)

Methyl and ethyl oleate are created by reacting fatty acids from vegetable oil with an alcohol to create an adjuvant that increases the efficacy of herbicides.



*Adjuvants can increase the efficacy of other herbicides*

The oleates act as powerful solvents which dissolve and soften the waxy cuticle that covers the leaves and stems of weeds. In a mix with a herbicide this allows the herbicide to travel through the leaf surface rather than just sitting on top of it. This allows a much smaller dosage of herbicide to effectively control a weed, especially for hardy weeds with thick, leathery leaves.

Oleates also have a high boiling point, and low volatility. When a product like **Hasten NT Ultra Spray Adjuvant** is mixed with a herbicide it can help prevent evaporation, which can cause a herbicide to crystalize or stop moving into a plant. The adjuvant helps keep the herbicide in a liquid, absorbable state on the leaf for a much longer period of time, helping to increase efficacy, lower dosages, and prevent the need for re-application.

The heavier droplets of herbicides with added oleates also help reduce application drift, and help the herbicide to “stick” to the leaf so it won’t wash away if it rains shortly after application.

## Insecticides

Insecticides are used to control insects, and this category is also used to cover the use of products intended to control mites (miticides), ticks (acaricides), and other invertebrate species (eg. molluscicides).

There are several different programs that specifically target the management of insects. Many of these are monitoring programs for the early detection of invasive species, and do not involve the regular application of insecticides, but some programs are more dependent on judicious application of insecticides.

### Mosquito Program

The mosquito control program encompasses an extensive area of over 1400 km<sup>2</sup>, covering both public and private properties within the City of Edmonton. It also extends to neighboring counties such as Sturgeon, Strathcona, Leduc, and Parkland, as well as the Enoch Cree Nation and the Town of Beaumont.



#### *Culex pipiens*

*This West Nile vectoring mosquito has invaded Alberta. It has been found thriving in Edmonton temporary pools, sewer catchbasins, and backyard containers.*

Following City Council's 2022 redirection of resources toward biological controls and surveillance, the aerial mosquito program was discontinued for the first time since 1973. Operational focus shifted to ground-based mitigation, with crews employing backpack equipment to treat temporary water impoundments in roadside ditches, parks, ravines, and industrial sectors throughout the city.

These temporary habitats provide ideal conditions for the rapid development of mosquito larvae, as they lack longer-lived species like fish or dragonflies that act as natural predators.

The products employed in the program contain biorational active ingredients derived from naturally occurring soil bacteria. These products comprise proteins that are specifically toxic to mosquito larvae that consume the treated water while feeding. They have minimal impact on most other species, ensuring a targeted approach.



**Insecticide Spotlight:**  
**VectoLex WSP Biological Larvicide**

VectoLex WSP (Water Soluble Pouch) is a specialized biological larvicide designed for targeted control of mosquito larvae, particularly in urban and suburban environments. It is highly regarded for its efficacy in “dirty” or polluted water, duration, and ability to target *Culex* species.

Pouches are designed to be dropped directly into catch basins or storm drains. They dissolve in about one minute, releasing granules that distribute throughout the larval feeding zone, and remain effective for up to 28 days.

Similar in action to Bti (*Bacillus thuringiensis israelensis*) widely used in the larger mosquito control program, VectoLex uses proteins derived from a different bacteria, *Lysinibacillus sphaericus*.

Floodwater mosquitoes take advantage of rainfall events to rapidly multiply, overwhelming potential predators. The goal of the program is not to eliminate mosquitoes entirely in the Edmonton area, but to flatten the peaks, and mitigate the population spikes triggered by precipitation. Treatment is administered only when significant hatching of mosquito larvae is detected, typically occurring around three to four times a year following snow melt, and major rain events.

Conditions from 2022-2025 have been extraordinarily dry, with some of the driest springs on record. This has resulted in very low populations of mosquitoes, and resultant low amounts of larvicides needed to reduce their populations following rain events.

Since its arrival in the Edmonton region in 2020, *Culex pipiens* (the northern house mosquito) has become a primary focus of local surveillance due to its potential role as a West Nile virus vector.

Unlike native floodwater species, *Culex pipiens* thrives in heat rather than rain, with populations peaking in late summer. It colonizes stagnant water in artificial containers, most notably urban stormwater catch basins, which it has rapidly inhabited across the city.

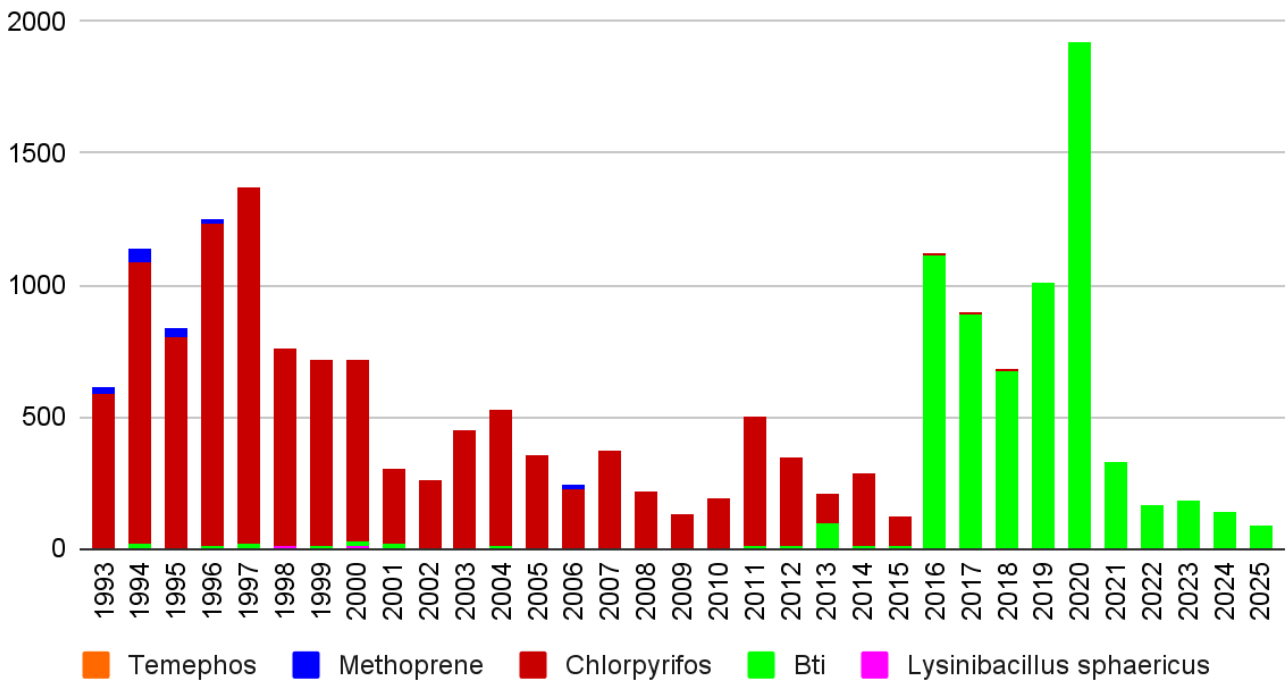
Current local populations appear to be ornithophilic (bird-preferring). Consequently, despite rising numbers, there hasn't been a corresponding increase in human biting complaints or West Nile transmission to residents.

A 2024 pilot program tested **VectoLex WSP Biological Larvicide** sachets in catch basins. While the treatment was highly effective at reducing larvae, the trial noted that a city-wide rollout would require significant operational resources and logistical scaling and was discontinued.

**Table 3 - City of Edmonton Insecticide Use: Mosquito Program (2022-2025)**

Product Name	Active Ingredient	PCP Number	2022 Active Ingredient Usage (kg)	2023 Active Ingredient Usage (kg)	2024 Active Ingredient Usage (kg)	2025 Active Ingredient Usage (kg)
Aquabac XT Biological Larvicide	<i>Bacillus thuringiensis israelensis</i> (Bti)	26860	22.47	-	-	-
Vectobac 200G Biological Larvicide	<i>Bacillus thuringiensis israelensis</i> (Bti)	18158	116.7	119.0	85.6	49.7
Vectobac 1200L Biological Larvicide	<i>Bacillus thuringiensis israelensis</i> (Bti)	21062	22.3	39.8	50.0	36.7
Vectolex WSP Biological Larvicide	<i>Lysinibacillus sphaericus</i> (Bsp)	28009	-	-	0.09	-

Fig 6. Mosquito Larvicide Use 1993-2025



### Black Fly Program

For the past several years, numbers of black flies (Diptera: Simuliidae) developing in Edmonton creeks and artificial facilities have been increasing. Artificial ponds and streams with rapidly flowing water over a hard substrate (rocks or concrete) in particular provide excellent habitat for black fly development.



#### Black Fly

*Black flies are small, black or grey flies. They feed mainly on nectar, but some species take blood meals from birds or mammals to provide protein for egg production.*

*Their eggs are laid in running water, and the larvae attach themselves to submerged rocks.*

In 2021 and 2022 a pilot program was developed to investigate the feasibility of treating black flies in artificial habitats, as well as sites in Mill Creek and Whitemud Creek with **Vectobac 1200L Biological Larvicide**. A Special Use Approval for this treatment was obtained from Alberta Environment and Protected Areas.



Mill Creek Ravine

The program found that treatment of black flies requires considerable usage of the product at regular intervals. The very limited 2022 program used nearly 50% of the amount of product as the entire mosquito roadside ditch mosquito program. Even with this amount of product used, it had minimal impact on black fly numbers, especially in natural environments. At the same time, numbers of black fly development sites and complaints about black fly bites dropped considerably in 2022, possibly due to weather conditions. There are no plans to continue with the program.

Table 4 - City of Edmonton Insecticide Usage: Black Fly Program (2022)			
Product Name	Active Ingredient	PCP Number	2022 Active Ingredient Usage (kg)
Vectobac 1200L Biological Larvicide	<i>Bacillus thuringiensis israelensis</i> (Bti)	21062	10.7

### Tree Pest Program

The urban forest canopy is a thriving, resilient, and interconnected network that enriches the lives of all in Edmonton. Protecting our canopy from insects and disease requires continual monitoring and assessment, and sometimes requires invention in the form of insecticides to combat infestations.



Elm scale treatment

*An invasive pest introduced on new plantings, European elm scale is now widespread across Edmonton. It is not a regulated pest, but threatens the health of many trees. Shown here, an elm tree is prepared for the injection of TreeAzin Systemic Insecticide to reduce this pest.*

These insect infestations are typically a byproduct of an unbalanced ecosystem and stressed trees, and commonly occur more often in the trees that line our boulevards and streets than in those in open park spaces or natural areas.

With over 300,000 inventoried, maintained trees in Edmonton, the

quantities of insecticide used for the protection of the urban forest are quite low. The primary target has been European elm scale, but systemic injections have also been used to protect black and Manchurian ash from cottony psyllids.

While no products are currently registered to directly target the beetle vectors of Dutch elm disease (DED), some elms near DED detections are receiving injections of **TreeAzin Systemic Insecticide**. This treatment is prioritized to reduce European elm scale, which can stress the trees and cause branch dieback. Since dead and dying branches are the main location for DED beetle vectors to establish breeding galleries, this proactive step aims to reduce favorable breeding sites.

**Table 5 - City of Edmonton Insecticide Usage: Tree Pest Program (2022-2025)**

Product Name	Active Ingredient	PCP Number	2022 Active Ingredient Usage (kg)	2023 Active Ingredient Usage (kg)	2024 Active Ingredient Usage (kg)	2025 Active Ingredient Usage (kg)
Dipel 2X DF Biological Insecticide Dry Flowable	BT Kurstaki	26508	1.37	-	-	-
Orthene 75% Soluble Powder Systemic Insecticide	Acephate	14225	1.78	-	-	-
Orthene 97% Soluble Granule Systemic Insecticide	Acephate	29499	2.17	1.4	0.2	0.0002
Pounce 384 EC Insecticide	Permethrin	16688	-	-	0.07	0.04
Safer Trounce Yard & Garden Insecticide Concentrate	Fatty Acids	20564	-	-	-	5.4
	Pyrethrins	20564				0.054
TreeAzin Systemic Insecticide	Azadirachtin	30559	0.13	11.8	11.4	8.9



Bald-faced hornet

*Although called a hornet, the bald-faced hornet is actually a type of yellowjacket. They typically build their nests high in trees, and are important predators of caterpillars and flies.*

### Yellowjacket Program

Yellowjackets thrive in hot, dry conditions. Nests grow larger and more quickly as workers are able to forage for more food. Several years of hot, dry summers has led to high populations of yellowjackets, and the summers between 2022 and 2025 have been some of the hottest on record. Six of the top ten hottest temperatures ever recorded in Edmonton have been in the last five years.

Pest Operations attend to hundreds of 311 Notifications regarding yellowjacket nests on City property every year, and many of these deal with multiple nests. Most nests can be removed mechanically, but hidden or inaccessible nests may require chemical treatment.

Table 6 - City of Edmonton Insecticide Usage: Yellowjacket Program (2022-2025)						
Product Name	Active Ingredient	PCP Number	2022 Active Ingredient Usage (kg)	2023 Active Ingredient Usage (kg)	2024 Active Ingredient Usage (kg)	2025 Active Ingredient Usage (kg)
Dragnet FT Emulsifiable Concentrate Insecticide	Permethrin	24175	0.12	0.08	-	0.06
Drione Insecticide Dust	Pyrethrins	15255	0.0042	0.0013	0.0035	0.001
	Piperonyl Butoxide	15255	0.04	0.001	0.03	0.01
	Amorphous Silica Gel	15255	0.17	0.005	0.14	0.04

**Insecticide Spotlight:**

**Imidacloprid**

Imidacloprid is a neo-nicotinoid insecticide, a class of pesticides frequently associated with negative outcomes, such as Colony Collapse Disorder. Nevertheless, when used correctly, such products remain a valuable part of our available resources.

Within the structural pest program, it is utilized in indoor bait stations in very minimal quantities, only a few hundred milligrams annually, which virtually eliminates risk to outdoor pollinators.

**Structural Pest Program**

City of Edmonton Pest Operations manages pests inside structures for over 200 City facilities, including Parks buildings, arenas, recreation centres, transit garages, and Fort Edmonton Park. Mice, ants, cockroaches, and silverfish are common targets. Most pesticides used are in tamper-resistant strategically placed bait stations.

The Structural Pest Program uses both insecticides and rodenticides in small quantities, but mostly relies on cultural and mechanical controls such as exclusion and removing food sources.

**Table 7 - City of Edmonton Insecticide and Rodenticide Usage: Structural Pest Program (2022-2025)**

Product Name	Active Ingredient	PCP Number	2022 Active Ingredient Usage (kg)	2023 Active Ingredient Usage (kg)	2024 Active Ingredient Usage (kg)	2025 Active Ingredient Usage (kg)
Contrac Blox Kills Rats & Mice	Bromadiolone	22239	0.004	0.007	0.004	0.003
Contrac Super Size Blox Kills Rats & Mice	Bromadiolone	23870	0.00007	0.0005	0.00007	0.0006
Dragnet FT Emulsifiable Concentrate Insecticide	Permethrin	24175	0.38	0.31	0.96	0.92
MaxForce Impact	Clothianidin	32275	-	-	0.00053	-
MaxForce Quantum Ant Bait	Imidacloprid	30513	0.000015	0.000009	.000005	0.00001
MaxForce Roach Killer Gel	Hydramethylnon	24240	0.007	0.002	0.002	0.00009

## Rodenticides

While some rodenticides are used to help control mice inside City buildings, most use of rodenticides targets Richardson's ground squirrels and northern pocket gophers which cause structural damage to sports fields, open spaces, and neighbouring gardens. When required, most are removed through physical trapping, but sometimes baiting of burrows or chemical intervention is required.

**Table 8 - City of Edmonton Rodenticide Use: External Rodents Program (2022-2025)**

Product Name	Active Ingredient	PCP Number	2022 Active Ingredient Usage (kg)	2023 Active Ingredient Usage (kg)	2024 Active Ingredient Usage (kg)	2025 Active Ingredient Usage (kg)
Rozol RTU Field Rodent Bait	Chlorophacinone	29515	0.007	0.009	0.009	0.002
Ground Force Paraffinized Pellets Rodenticide	Chlorophacinone	20239	-	0.0018	0.0016	-
RoCon Concentrate Rodenticide	White Mustard Seed Powder (Brassica Hirta)	27400	-	-	55.3	37.3
	Sodium Alpha-olefin sulfonate sodium	27400			35.1	23.6



### Northern pocket gopher

*Often mistaken for a mole or ground squirrel, northern pocket gophers are solitary underground dwellers who feed on plant roots and are active year-round.*

### Rodenticide Spotlight: RoCon Concentrate Rodenticide

**RoCon Concentrate Rodenticide** is a specialty pest control product designed primarily for the management of burrowing rodents, specifically Richardson's ground squirrels and Norway rats.

Unlike traditional rodent baits that rely on ingestion of anticoagulants or neurotoxins, RoCon uses a mechanical asphyxiation method. Utilizing a combination of white mustard seed powder and sodium alpha-olefin sulfonate it is pumped into the burrow and forms a soapy foam that fills the entire cavity, displacing the air.

*They are declared a nuisance under Alberta Agricultural Pest Act, but northern pocket gopher burrows are important overwintering habitat for many species such as tiger salamanders. Because of the possibility of non-target wildlife in the burrows, RoCon is NOT used for control of northern pocket gopher.*

Because it contains no poisons, it is considered non-toxic to the environment, and there is zero risk of secondary poisoning to predators such as hawks, coyotes, or dogs that might scavenge the remains. It also has a very high control rate as it does not depend on the rodent's feeding habits or bait acceptance.

## Fungicides

Fungi can cause serious damage in plants, and are a major concern for maintaining a healthy turf, especially in areas like golf courses where consistency is important. Many fungal pathogens can be deadly to plants, and act rapidly. Dutch elm disease is a fungal pathogen that is vectored by beetles, and affects all species of elms, but especially American elm, which makes up a major proportion of Edmonton's boulevard and park trees.



Smaller European elm bark beetle

*The primary vector of Dutch elm disease (DED) in North America, the smaller European elm bark beetle is named under federal, provincial and municipal regulations.*

*There has been only one detection of this beetle in Edmonton since 2021, indicating it is likely not the main vector of DED in Edmonton.*

### Fungicide Spotlight: Arbotect 20-S Fungicide

Dutch Elm Disease (DED) is caused by a fungus and has resulted in significant elm loss in other municipalities in the 81 years that it has been present within Canada. The potential impact on Edmonton's urban forest is substantial, as the City manages about 90,000 public elm trees (22 per cent of City inventory), with additional estimated 45,000 elms on private property.

In 2024 DED was confirmed for the first time in Edmonton, with 5 trees confirmed in 2024, and 2 more trees in 2025. Those trees were removed and disposed of immediately, but the fungus, vectored by beetles remains a threat to Edmonton's urban forest.

Fungicides such as **Arbotect 20-S Fungicide** are used not as a potential cure for afflicted trees, but as a prophylactic to prevent the fungus from infecting a healthy tree.



**Banded elm bark beetle**

*The banded elm bark beetle has spread to Edmonton and as far north as Grande Prairie. Numbers throughout the province have been increasing in recent years. It prefers Siberian elm, but has now also been found in American elm, seemingly pushing out the smaller European elm bark beetle.*

*These beetles are thought to have vectored the latest cases of Dutch elm disease in Edmonton. The beetle is not currently regulated under any level of legislation.*

Trees in the vicinity of any positive DED cases are assessed for suitability for injection, and given a preventative injection. The injection is only effective for a few years. Trees will be monitored, and may be re-injected depending on the progression of DED in the city.

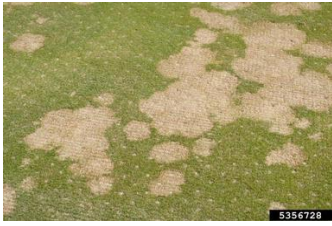
The applications are performed in late spring or early summer once the tree is in full leaf and actively transpiring, and uptake is assisted with supplemental watering. Small holes are drilled in the root flare, and a high-volume, low-pressure system is used to infuse the tree with a mixture of fungicide and water. This can take several hours per tree.

The tree must be relatively healthy, and well-hydrated to take the large volume of solution required for effective treatment. Any sort of root damage or restrictions may render a tree ineligible. If not diluted or applied correctly, there is a risk of chemical injury to the tree’s cambium layer at the injection sites.

Table 9 - City of Edmonton Fungicide Use: Dutch Elm Disease Program						
Product Name	Active Ingredient	PCP Number	2022 Active Ingredient Usage (kg)	2023 Active Ingredient Usage (kg)	2024 Active Ingredient Usage (kg)	2025 Active Ingredient Usage (kg)
Arbotect 20-S Fungicide	Thiabendazol	16694	-	-	-	7.2

**Golf Course Program**

The City of Edmonton manages the golf courses at Victoria, Riverside, and Rundle Park, where the focus is on upholding exceptional turf quality and meeting an enhanced standard. Sustaining the well-being of these greens requires year-round commitment to maintenance, which involves a variety of mechanical and cultural practices like mowing, irrigation, and



Snow mold on turf

*Fungus growing beneath the snow can cause extensive damage to managed turf. Some fungal pests of turf can be managed with pesticides. Cultural practices such as mowing turf short in the fall can help reduce fungal damage.*

fertilization. Furthermore, the judicious and timely use of pesticides is occasionally necessary to protect against weed growth and fungal turf diseases, ensuring the optimal condition of the golf courses.

Maintenance of golf courses does include some herbicide use, which is included in the Open Space Herbicide data (above). Most of the pesticides used in the golf courses are fungicides, listed here:

Table 10 - City of Edmonton Fungicide Use: Golf Course Program (2022-2025)						
Product Name	Active Ingredient	PCP Number	2022 Active Ingredient Usage (kg)	2023 Active Ingredient Usage (kg)	2024 Active Ingredient Usage (kg)	2025 Active Ingredient Usage (kg)
Banner Maxx Fungicide	Propiconazole	27003	4.7	-	-	4.3
Disarm Turf Fungicide	Fluxastrobin	31857	-	0.7	0.7	-
Heritage Maxx Fungicide	Azoxystrobin	28393	1.8	3.5	3.5	3.5
Instrata II A Fungicide	Fludioxonil	32712	1.8	-	-	-
Instrata II B Fungicide	Benzovindiflupyr	32711	0.2	-	-	-
Instrata Fungicide	Chlorothalonil	28861	72.4	82.7	82.7	82.7
	Fludioxonil		2.9	3.3	3.3	3.3
	Propiconazole		11.4	13.0	13.0	13.0
Posterity Fungicide	Pydiflumetofen	33019	0.3	0.6	0.6	0.3
Secure Fungicide	Fluazinam	32991	1.1	-	-	0.2

## Muttart Conservatory



Nestled in the river valley, the City's premier horticultural attraction features more than 700 species of plants in three climate-regulated biomes, and grows a variety of horticultural species in its greenhouses. These controlled environments provide unique challenges for pest management, with exotic insects being introduced, and the controlled environment allowing pests that could not survive outdoors in Edmonton to thrive.

Although pesticides are used when necessary, most pest management at the Muttart Conservatory is achieved through biological controls such as the release of natural predators. Many of the pesticides that are used are similarly biologically derived, or biorational products, including insect and plant growth regulators.

The unique environment of the enclosed greenhouses results in a similarly unique toolkit of products, few of which are used in any other program in the city. It also allows for very small quantities of products to be effective for managing issues. The artificial environments also result in highly dynamic pest situations, where an issue might be a significant outbreak one year, but does not reoccur regularly.

**Table 11 - City of Edmonton Insecticide Use: Muttart Conservatory (2022-2025)**

Product Name	Active Ingredient	PCP Number	2022 Active Ingredient Usage (kg)	2023 Active Ingredient Usage (kg)	2024 Active Ingredient Usage (kg)	2025 Active Ingredient Usage (kg)
Altus Insecticide	Flupyradifurone	33176	0.03	0.002	0.008	0.2
Avid 1.9% EC Miticide Insecticide	Abamectin	24485	0.001	0.003	0.007	0.008
Beleaf 50SG Insecticide	Flonicamid	29796	0.2	0.2	0.02	0.06
Dipel WP	BT Kurstaki	11252	-	-	-	0.003
Distance	Pyriproxifen	28414	0.009	8.1	-	0.06
Endeavor 50WG Insecticide	Pymetrozine	27273	0.005	0.02	0.02	-
Floramite SC Miticide	Bifenzate	27924	0.009	14.0	0.02	0.03
Fujimite Miticide/Insecticide	Penpyroximate	32302	0.01	0.01	0.02	
Kontos Insecticide	Spirotetramat	29567	0.2	-	-	
Pylon Miticide Insecticide	Chlorfenapyr	30666	-	-	-	0.04
Spear T Liquid Concentrate Biological Insecticide/Acaricide	GS-Omega/Kappa-HXTX-HV1A	34679	-	-	-	0.4
Ventigra Insecticide	Afidopyrofen	33309	0.005	2.0	0.04	3.9

### Insecticide Spotlight: Spear T Liquid Concentrate Biological Insecticide/Acaricide



Whitefly

*Whiteflies are tiny, winged insects related to aphids that feed on plant sap using piercing mouthparts.*

*Beyond physical damage, whiteflies are highly destructive because they act as vectors for numerous plant viruses. Their rapid life cycle and ability to develop resistance to common pesticides make them a difficult pest to manage in greenhouses and gardens.*

The primary component of **Spear T Liquid Concentrate** represents a significant technological shift in pest management by utilizing GS-Omega/Kappa-HXTX-HV1A, a synthetic version of a naturally occurring peptide derived from spider venom.

It is a neurotoxin that targets the central nervous system of specific insects. Once the insect comes into contact with or ingests the peptide, it causes paralysis and death.

Spear T is primarily used to control soft-bodied insects and mites, such as thrips, whiteflies, two-spotted spider mites and aphids in high-density greenhouse environments.

Because it utilizes a unique mode of action it is an excellent tool to control populations that have developed resistance to traditional chemical pesticides, such as whiteflies.

**Table 12 - City of Edmonton Fungicide Use: Muttart Conservatory (2022-2025)**

Product Name	Active Ingredient	PCP Number	2022 Active Ingredient Usage (kg)	2023 Active Ingredient Usage (kg)	2024 Active Ingredient Usage (kg)	2025 Active Ingredient Usage (kg)
Bonzi Plant Growth Regulator	Paclobutrazol	25453	0.0001	0.003	-	0.0005
Daconil 2787 Flowable Fungicide	Chlorothalonil	15724	0.07	0.2	0.02	0.01
Rhapsody ASO	<i>Bacillus subtilis</i> (Strain QST 713)	28267	0.003	-	-	-
Senator 50 SC Fungicide	Thiophanate-methyl	32096	0.04	0.2	0.3	3.5

## Appendix 1

### Photo Credits

- Cycle of Integrated Pest Management: prompted in Google Gemini, 2025
- Purple loosestrife: City of Edmonton Pest Management Lab
- Spongy Moth: Ferenc Lakatos, [ipmimages.org](http://ipmimages.org)
- White cockle: Daniel Laubhann ([edmonton.ca](http://edmonton.ca))
- Phragmites: Caleb Slemmons, National Ecological Observatory Network, [Bugwood.org](http://Bugwood.org)
- Orange hawkweed: Daniel Laubhann, City of Edmonton
- Pine false webworm: Barry Lyons, CFS, [Bugwood.org](http://Bugwood.org)
- Train tracks: prompted in Google Gemini, 2026
- Adjuvants on leaf: prompted in Google Gemini, 2026
- Culex pipiens: Ary Farajollahi, [Bugwood.org](http://Bugwood.org)
- VectoLex WSP Pouch: Valent Biosciences
- Black Fly: [Bugguide.net](http://Bugguide.net)
- Mill Creek Ravine: Danna, [tripadvisor.com](http://tripadvisor.com)
- Northern pocket gopher: [interestinganimals.net](http://interestinganimals.net)
- Smaller European elm bark beetle: Joseph Benzel, Screening Aids, USDA APHIS PPQ, [Bugwood.org](http://Bugwood.org)
- Banded elm bark beetle: Pest and Diseases Image Library, [Bugwood.org](http://Bugwood.org)
- Elm scale treatment: City of Edmonton Pest Management Lab
- Bald-faced hornet: City of Edmonton Pest Management Lab
- Snow mold: William M. Brown Jr., [Bugwood.org](http://Bugwood.org)
- Muttart Conservatory: [edmonton.ca](http://edmonton.ca)
- Whitefly: [lovethegarden.com](http://lovethegarden.com)

## Appendix 2

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