



City Council Memorandum

City of Arts & Innovation

TO: HONORABLE MAYOR AND CITY COUNCIL DATE: JANUARY 14, 2020

FROM: COMMUNITY & ECONOMIC DEVELOPMENT WARDS: ALL
DEPARTMENT

SUBJECT: CONSIDERATION OF GLYPHOSATE USE BY CITY DEPARTMENTS

ISSUE:

Determine whether to continue or amend the Citywide temporary glyphosate moratorium.

RECOMMENDATIONS:

That the City Council:

1. Receive and review this report on glyphosate use by different City departments;
2. Consider the outcomes and impacts of the Citywide temporary glyphosate moratorium placed into effect in April 2019; and
3. Provide direction to staff on whether to continue or amend the Citywide temporary glyphosate moratorium.

BACKGROUND:

Members of the public have expressed concerns regarding the City of Riverside's use of glyphosate. As a result, a request was made of staff to come to the City Council with a discussion on the City's use of this herbicide. It is hoped that this report will serve as an informative discussion of the reasons why and how the City uses glyphosate-based products, as well as address the public's concern over the product.

Glyphosate is a broad spectrum, non-selective systemic herbicide. This means the targeted weed is killed completely to the root and does not come back. It is currently approved and registered as a general use herbicide under several trade names, with the Roundup label being the most well-known. Glyphosate is used as a post-emergence herbicide in agricultural operations and turf grass (including golf courses and residential lawns) applications. In the U.S., the product contains a surfactant, Polyethoxylated Amine (POEA), which is used to lower the surface tension of the plant to allow for root permeation, and therefore provides a systemic treatment to kill the entire targeted plant. The product comes as an acid and several salts.

The largest use of glyphosate is in agricultural applications in conjunction with genetically altered crops to control weeds. In particular, approximately 90% of corn and soy crops grown in the U.S.

have been genetically modified to tolerate glyphosate. The combination of genetically engineered crops and application of glyphosate have been a cause of concern for some consumers. Between 1987 and 2012, the use of glyphosate by farmers grew from 11 million pounds to nearly 300 million pounds. Some consumers feel testing on the safety of food crops treated with glyphosate are insufficient to ensure glyphosate-treated crops are safe. However, information published by the manufacturer, government agencies, non-government agencies, and research organizations state glyphosate-based herbicides when used as directed have a long history of safe use, with more than 800 studies submitted to regulators as part of the registration process supporting the safety of glyphosate. Studies relevant to the United States Environmental Protection Agency's 2017 Cancer Risk Assessment concludes "glyphosate is not likely to be carcinogenic to humans," the Agency's most favorable rating.

Glyphosate was introduced commercially by the Monsanto Corporation in 1974, and is currently used in more than 160 countries and mostly in agricultural applications. Recently, local municipalities and other organizations have questioned the use of glyphosate for weed control and treatment of other broadleaf plants and grasses.

Glyphosate is labeled for use and regulated by the United States Environmental Protection Agency (EPA or Agency), and in the State of California by the California Department of Pesticide Regulation (DPR). All approved pesticides and herbicides carry a label, and one of three ratings - "Caution," "Warning," and "Danger" - to inform of the potential hazard of the active ingredients and other solvents contained in the product. "Caution" is the least toxic of the category, and generally less dangerous but still must be handled carefully and label instructions must be followed. Herbicides with the "Warning" label pose a specific hazard to people, such as severe skin or eye injury, or a particular danger to the environment. Herbicides with the label "Danger" are the most toxic or dangerous, and often have the word Poison and the skull-and-crossbones on the label. Any substance - whether a pesticide, household cleaner, or over-the-counter medication - can be dangerous if not used correctly and in accordance to its label instructions. The Roundup label carries the "Caution" warning. Common household products with a "Danger" label include Clorox Bleach and Clorox Cleaner.

A substance's acute toxicity, or short-term poisoning potential, is determined by Lethal Dose 50 (LD50). LD50 is the dose of a chemical given at once that will cause death in 50 percent of the test animals receiving it. The larger a chemical's LD50 number, the less toxic the product is. The acute oral LD50 for glyphosate is 5,600 mg/kg in rats. For perspective, the LD50 for rats for some common products are as follows: caffeine 140 mg/kg, aspirin 200 mg/kg, sugar 30,000 mg/kg, salt 3,000 mg/kg, chlorine 850 mg/kg, alcohol (ethanol) 7,060 mg/kg, and water 90,000 mg/kg. Even though the LD50 values show the glyphosate compound to be relatively non-toxic it can cause significant eye irritation. (Source: EXTOWNET Pesticide Information Profile on Glyphosate, Cooperative Extension Offices of Cornell University, Michigan State University, Oregon State University, and University of California at Davis). For a 150 pound person, it takes about 120 cups of coffee, or about 17 shots of 90 proof alcohol to kill half of the people who ingest this amount. Label applications require Roundup concentrate to be diluted to a 1.5% solution, or 4 tablespoons per gallon of water. While no one would ever drink Roundup, for comparison purposes, one would have to drink seven gallons of the diluted product to kill half of the 150 pound people used in this example.

In July 2017, the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (CalEPA OEHHA) added glyphosate to the Proposition 65 list of carcinogens based on a finding by the World Health Organization's International Agency for Research on Cancer (IARC) that glyphosate is an animal carcinogen and "probably carcinogenic

to humans.” It is important to note that the Proposition 65 list is not a list of banned chemicals. Rather, Proposition 65 requires clear and reasonable warnings for exposures to chemicals. The Proposition 65 list includes a wide range of chemicals, including certain constituents found in pesticide and herbicide formulations, common household products, food, drugs, dyes, and solvents. Proposition 65 does not ban or limit the use of listed chemicals; instead, it requires a business to provide a warning prior to exposing a person to a listed chemical when typical use of a product or a business’s operations results in exposure to the chemical.

On August 8, 2019, the U.S. EPA issued a statement challenging CalEPA’s mandate to place glyphosate on the Proposition 65 list stating, “The State of California’s much criticized Proposition 65 has led to misleading labeling requirements for products, like glyphosate, because it misinforms the public about the risks they are facing.” The news release further states, “In April, EPA took the next step in the review process for glyphosate. EPA found – as it has before – that glyphosate is not a carcinogen, and there are no risks to public health when glyphosate is used in accordance with its current label. These scientific findings are consistent with the conclusions of science reviews by many other countries and other federal agencies.” (Source: EPA News Release EPA Takes Action to Provide Accurate Risk Information to Consumers, Stop False Labeling on Products, August 8, 2019)

The U.S. EPA published the 2017 Draft Human Health Risk Assessment on Glyphosate Memorandum (2017 Memorandum), which reviewed the potential human health risks of glyphosate as part of the product’s registration renewal. The Agency reevaluated the human carcinogenic potential of glyphosate, which included a weight-of-evidence evaluation of data from animal toxicity, genotoxicity, and epidemiological studies. The memorandum’s occupational risk assessment summarized for glyphosate, “based on the currently registered use patterns, there is a potential for short-term dermal and inhalation exposure to occupational handlers (mixing, loading, and applying) as well as short-term dermal and inhalation exposure from post-application activities.” The EPA concluded that glyphosate should be classified as “not likely to be carcinogenic to humans.” (Source: United States Environmental Protection Agency, “Glyphosate. Draft Human Health Risk Assessment in Support of Registration Review,” December 12, 2017).

While the EPA’s 2017 Memorandum did not identify public health risks in the report’s health risk assessment, the report’s ecological assessment did identify ecological risks. To address identified ecological risks, EPA has proposed spray drift management measures to assist farmers with target pesticide applications on the intended pest, to protect pollinators, and reduce the problem of weeds becoming resistant to glyphosate.”

In 2018 and 2019, three jury verdicts tied Roundup to cancer, awarding plaintiffs millions of dollars in compensatory and punitive damages. In each of these cases, plaintiffs successfully argued that continuous exposure from their use of Roundup and its active ingredient glyphosate over long spans of time, played an active role in the development of non-Hodgkin’s lymphoma. In August 2018, a jury found that former groundskeeper Dewayne Johnson likely developed non-Hodgkin’s lymphoma from many years of use of Roundup. A March 2019 trial resulted in a jury concluding that Monsanto was responsible for the Plaintiff’s non-Hodgkin’s lymphoma and that the manufacturer acted in “malice or oppression.” This second case took place in Alameda County, where a jury ruled that Alva and Alberta Pilliod, a couple in their 70s, developed non-Hodgkin’s lymphoma from their 30 years of use of Roundup to kill weeds at three properties they owned; the jury concluded that Roundup had been defectively designed, that the manufacturer failed to warn of the herbicide’s cancer risk, and that the manufacturer acted negligently.

Bayer AG, the parent company of Monsanto, is appealing these decisions, saying Roundup and its active ingredient are not carcinogenic and safe for human use. The August 22, 2019 Reuters article “Explainer, What are the obstacles to Bayer settling Roundup lawsuits?” states Bayer AG, the parent company of Monsanto, is in mediation to potentially settle thousands of U.S. lawsuits claiming that the company’s Roundup causes cancer. There is an estimated 18,400 plaintiffs claiming Roundup cause non-Hodgkin’s lymphoma. Bayer is in confidential global mediation with plaintiffs to potentially settle lawsuits.

DISCUSSION:

The City of Riverside has historically used Roundup to control weeds. From an aesthetic perspective, proper and safe use of Roundup has facilitated maintenance of City facilities, landscapes, open space, streets, alleys, and public spaces. Uncontrolled weeds can cause damage to asphalt and concrete surfaces resulting in increased maintenance and require replacement sooner if not kept weed free. Untreated, weeds also provide harborage for rodents, are a fire hazard, and moreover are considered a nuisance per City Code.

Roundup, as a systemic herbicide, has been the preferred herbicide because a single application has the ability to kill the weed from the green tissue to the root rather than simply burning the leaves off. According to the EPA, “there are no risks to public health when glyphosate is used in accordance with its current label” (EPA website), and state laws require applicators to obtain and demonstrate appropriate training prior to use. Alternative products, such as vinegar, plant oil extracts, and other organic and chemical herbicides (e.g. contact herbicides) are available for weed control. It should be noted that horticultural vinegar is not labeled for use as a pesticide in the state of California and therefore it is illegal to use as a pesticide. While these non-glyphosate products control weeds, they do not provide systemic weed abatement, meaning the product only kills the leaves it comes in contact with and the weed will regrow from the root stock that was not killed from treatment with a contact herbicide. In other words, if half of a weed is sprayed with a non-systemic herbicide, only that half of the weed that is exposed above ground will die, and can later re-establish with its root system still intact. Non-systemic herbicides work best on very small weeds (seedlings) and are not effective on larger weeds or perennial weeds such as Bermuda grass. In order to have measurable control of weeds using non-glyphosate herbicides, they must be applied more frequently, as much as bi-weekly, or be completely removed manually with its root stock intact. Roundup, by comparison, has historically been applied two to three times annually for effective systemic treatment, killing the entire weed to its roots. Roundup products used by the City are the same products containing glyphosate that homeowners can purchase at home improvement retailers.

Health and safety of city employees and residents are paramount. City departments are responsible for maintaining the Department’s pesticide use manual which provides recommendations and includes special conditions for safe use and maintains updated Safety Data Sheets for each pesticide and herbicide product. Additionally, the Public Works’ Safety Officer oversees a comprehensive Citywide environmental, health and safety management program, and staff works closely with its labor groups to maintain a safe work environment. All City employees who perform pesticide and herbicide applications undergo annual training on safety, and safe and effective use of pesticides and herbicides, and don proper Personal Protective Equipment (PPE) prior to applications. Additionally, state law requires that City staff follow strict safety guidelines in the use of herbicides and must hold either a California Department of Pesticides Regulation Qualified Applicator Certificate or License. These licenses and certificates demonstrate City employees have studied for and passed a test concerning the

proper application of pesticides and herbicides, and the laws surrounding their use. Supervising staff, Crew Leads, Inspectors, and Maintenance Workers in the Public Works and Parks & Recreation Departments hold DPR Qualified Applicator Certificates. Every contractor hired by City departments for landscape maintenance and vegetation control are required by the City and state regulations to hold current DPR Qualified Applicator Certificates and Licenses. City staff and contract landscapers are required to follow protocols that provide application rates and application timing recommendations to minimize risks of glyphosate exposure to the public.

The Riverside County Agricultural Commissioner's Office also requires annual pesticide and herbicide use reporting and storage facilities inspections to insure compliance with state and federal laws, including confirming the responsible parties have licenses and certifications in good order. The City's pesticide use and storage facilities undergo annual reporting and inspection with the Riverside County Agricultural Commissioner's Office.

In April 2019, the City Manager placed a temporary moratorium on the use of glyphosate as City staff collected information on how the product is being used Citywide and aggregate this information for City Council to review. The following discussion provides responses to questions that were asked of each City department identified to use glyphosate-based products:

1. Locations and frequency of treatment;
2. Observations of using alternative treatments since the temporary moratorium was placed;
3. Additional relevant information that may assist in informing the City Council and City Management.

City Use by Department

City departments using glyphosate include: Public Works; Parks, Recreation & Community Services; General Services; and Riverside Public Utilities.

Public Works

The Public Works Department has the responsibility of maintaining streets and public right-of-ways including greenbelt shoulders, edge of roads, cracks within the road, dead ends and cul-de-sacs, medians, bike lanes, bike paths, the Santa Ana bike trail, canal maintenance roads, and properties owned by Public Works. Public Works operated facilities include the wastewater treatment facility, which is connected to the retention basin. Prior to the moratorium, glyphosate was used for weed control two to three times annually. Since the temporary ban was placed, use of alternative chemically-based weed control herbicides have required increased treatment frequency, increasing applications to an equivalent of seven to eight times annually. Landscape contractors have been experimenting with applications of alternative non-glyphosate herbicides such as Finale, Reward, and Speed Zone. Use of these alternative chemical herbicides, known as contact herbicides, have imposed longer times required before re-entry into treatment areas. Contact herbicides function differently than systemic herbicides by only killing green vegetation and not down to the roots; as a result, previously treated weeds have returned and required subsequent reapplications, and weed populations have been observed to expand. The cost of these alternative contact herbicides are approximately three times the cost of using Roundup and require more follow-up treatments when regrowth occurs. Organic-based treatment products have not been utilized by Public Works, as they are cost prohibitive at approximately five times the cost compared to Roundup. The effectiveness of contact herbicides are currently still under experimental application by contractors and will require more time to determine their efficacy. In the meantime, the Department's Street Division has experienced a tripling of public complaints

due to regrowth of weeds treated with non-glyphosate herbicides.

Parks, Recreation and Community Services Department

The Parks, Recreation and Community Services Department maintains park sites, and areas around park areas such as sidewalks, gutters, parking lots, and planters. Playgrounds are not treated by herbicides. Prior to the temporary glyphosate moratorium, developed park sites and surrounding areas were treated once per month with glyphosate. A fifty-foot perimeter along fence lines of Department-owned open-space and undeveloped park sites were treated twice annually with the same product. Since the moratorium, the Department has also used non-glyphosate herbicides to control weeds, and found increased costs with these products and reduced effectiveness in weed control. The Parks, Recreation and Community Services Department has received increased complaints regarding weeds from residents and the public.

Riverside Public Utilities

Riverside Public Utilities (RPU) owns and maintains properties on which RPU water and utility infrastructure exists, such as well and pump facilities, canal maintenance roads, and open fields. Public Utilities operates in two counties and five city jurisdictions outside the City of Riverside. Each of the sites operated by RPU have specific regulations for vegetation management and fire suppression. Water and electric sites have sensitive equipment and require zero vegetation; effective weed control is a critical component of onsite fire safety protocol. RPU utilizes landscape maintenance contractors to treat active water and electric facilities. Sites are on weekly, monthly, and quarterly visitation timeframes and Roundup was the primary product used for weed abatement prior to the glyphosate moratorium. When a landscape contractor visits a utility site, the Utility Substation Area Operator is required to be onsite while weed abatement activities are occurring. Glystar, a contact herbicide, has been the replacement product for weed control. The effectiveness of Glystar treatment at utility sites have been determined to be ineffective in terms of weed abatement performance when compared to the systemic-effectiveness accomplished by Roundup.

RPU has seen an increase in weed abatement costs in terms of materials as well as labor costs associated with more frequent treatments and additional labor to remove weeds. Landscape contractors have informed RPU that many sites may see a doubling in maintenance costs due to more frequent and time intensive weed abatement activities. Landscape contractors also provided warnings of increased weed infestation over time due to contact herbicides only providing vegetative kill, and not systemic treatments.

Due to sensitive equipment located at electrical substations and water treatment plants, RPU will request an exemption should the glyphosate moratorium continue. In the past six months since the glyphosate moratorium, RPU has seen an increase of 7.5%, or \$18,000, in their landscape maintenance from switching herbicide products. Should the City Council choose to ban glyphosate use, RPU must find an equally effective weed abatement product to stay in compliance with regulations across multiple jurisdictions in which Riverside Public Utilities operates its facilities. At this time, there is no available similarly effective systemic weed control product like Roundup that is both cost effective and very efficient at controlling weeds and unwanted vegetation at Riverside Public Utilities' sites.

General Services

The General Services Building Maintenance Division receives infrequent weed abatement

requests, which are sent to the Parks, Recreation and Community Services Department or a landscape contractor for treatment. General Services' Airport Division applied Roundup on a 6-week treatment cycle to control weeds along airport taxiways, runways, parking lots, and facility entrance. Since the moratorium, horticultural grade vinegar (20% acidity) has been utilized in a recipe for weed abatement and found to be ineffective. Similar to the other Departments, General Services has seen an increase in materials and labor costs from more frequent weed abatement activities with alternative non-glyphosate weed control products.

Cost Comparison

In 2018, the City of Riverside and its landscape contractors reported use of approximately 1,600 gallons of glyphosate-based herbicide for weed abatement across the city. The table below provides a materials cost analysis of using glyphosate herbicides versus non-glyphosate based herbicides.

Material	Material Cost per Acre	Number of Treatments Annually(generalized across the city)	Total Material Costs per Acre (annual, not including labor)
Glyphosate-based herbicides	\$25.06	2-3 times	\$50.12 - \$75.18
Non-glyphosate based herbicides	\$32.48	7-8 times	\$227.36 - \$259.84
Material cost difference per acre			\$177.24 - \$184.66

Alternative treatments include manual weeding, heat treatments via weed burners, non-glyphosate herbicides, and organically-based herbicides, with each having specific implications. Manual weed abatement requires increased costs in labor, equipment, and personnel. Weed burners require careful training, and additional personnel and equipment costs, and pose potential fire risks if used incorrectly. Contact herbicides and organic herbicides are limited in efficacy and can require at least three to four times more treatments compared to Roundup, thereby requiring additional labor and material resources.

Staff recognizes the public concern on Roundup. It is important to note the City's use of glyphosate is on an as needed basis, and staff and contract landscape applicators are highly trained to follow application guidelines to minimize any chemical exposure to the public.

Since the temporary moratorium was placed on glyphosate in April 2019, the City's use of alternative products and weed abatement activities have demonstrated increased frequency in alternative herbicide applications, resulting in increased applications of alternative herbicides, and increases in other supplies and labor costs associated with reduced effectiveness of non-glyphosate weed management methods. Maintaining effective weed control ensures the community has high quality parks, well-maintained streets and alleys, and safe city facilities at the lowest possible costs in both manpower and herbicide products used that is safe for both the applicator and public. The EPA is currently conducting further studies on Roundup and should it be determined that this product is unsafe, the City will not use it.

It is worth noting that at least three regional school districts have discontinued the use of Roundup based on public request. The districts in Irvine, Glendale and the Burbank Unified School District (BUSD) have stopped using the pesticide. BUSD agreed to stop using Roundup at the request of a locally organized group called Non-Toxic Burbank. BUSD advised that the

discontinuance would have little impact on their operations and maintenance costs due to the fact that they had a very limited number of places that required the use of any herbicides.

Municipalities that have restricted their use of Roundup are the Cities of Irvine, Sonoma, and Long Beach. Following City Council action in 2015 in response to a locally organized group, Non-Toxic Irvine, the City of Irvine agreed to restrict their use and will only use as a last resort with challenging areas. Irvine contracts out the majority of their landscape maintenance and has stated that the restriction has increased their costs. Municipalities that have reviewed glyphosate use and made decisions to continue the use of glyphosate as a weed management tool include Burbank and Glendale. The Burbank City Council directed staff to place a one-year moratorium on glyphosate at its park sites and directed park staff to test alternative products and return to council with findings on potential replacement products; Burbank's Public Works Department was allowed to continue use of glyphosate on sidewalks, alleys, and street medians.

It is important to note that use of glyphosate by City departments are in accordance with product label instructions and protocols, applied by trained staff under specific conditions. Additionally, the City relies on the U.S. EPA, the lead Agency that regulates glyphosate, on product safety information.

Staff recommends that the City Council consider whether the glyphosate moratorium should be stayed, released, or amended.

FISCAL IMPACT:

Since the temporary glyphosate moratorium, City departments have experienced a two to threefold increase in weed abatement and vegetative control costs from the use of alternative herbicide materials compared to that of glyphosate products. Labor costs associated with increased applications and weed abatement activities have not yet been quantified. Should the City Council consider banning or limiting the use of glyphosate including Roundup, it is anticipated that there will be a fiscal impact; by exactly how much is yet to be determined.

Prepared by: David Welch, Community & Economic Development Director
Certified as to availability of funds: Edward Enriquez, Chief Financial Officer / City Treasurer
Approved by: Rafael Guzman, Assistant City Manager
Approved as to form: Gary G. Geuss, City Attorney

Attachments:

1. Letter from Public Concerning Glyphosate
2. Fact Sheet on Glyphosate Safe Use
3. Fact Sheet on the Health Impact of Glyphosate
4. U.S. EPA 2017 Draft Human Health Risk Assessment on Glyphosate Memorandum
5. World Health Organization Q&A on Glyphosate
6. CalEPA Notice to Place Glyphosate on Proposition 65 List
7. U.S. EPA News Release
8. Washington Post Article on Glyphosate Lawsuits
9. Presentation