



March 13, 2021

Docket ID: **EPA-HQ-OPP-2020-0585**

Tracy Perry
Environmental Protection Agency
Office of Pesticide Programs
Pesticide Re-evaluation Division (7508P)
1200 Pennsylvania Ave, NW
Washington, DC 20460-0001

Re: Glyphosate; Draft Endangered Species Act Biological Evaluations.

The Weed Science Society of America (WSSA) appreciates the opportunity to submit comments on EPA's draft Endangered Species Act (ESA) Biological Evaluations (BEs) for glyphosate. The WSSA was founded in 1956 as a non-profit scientific society that fosters an awareness of weeds and their impact on our environment. Our membership includes academic and private sector professionals providing science-based information to the public and government policymakers, while promoting research, education, and outreach activities.

Glyphosate is a uniquely effective and generally nonselective herbicide that is very toxicologically and environmentally safe. Glyphosate is the only broad-spectrum, systemic herbicide that is labeled for control of more than 230 weeds with over 400 labeled uses in almost every type of crop, non-crop, pasture, right-of-way, turf, and ornamental production setting. In addition, glyphosate is only one of 15 herbicides labeled for aquatic weed control in lakes, ponds, streams, and irrigation canals.

Glyphosate has been widely adopted in conjunction with glyphosate-resistant ('Roundup Ready') crops, and is also commonly used to manage weeds in conservation tillage crop production, resulting in significant soil improvement and savings. Over the last 25 years, American farmers have made huge progress in reducing soil losses as well as cutting energy use by eliminating or lowering the amount of tillage they use mostly for weed control by substituting glyphosate to manage emerged vegetation at planting time. Compared to conventional tillage, conservation tillage systems have decreased sediment losses from 28 to as much as 88%, depending on the type of system and region of the country. Glyphosate has made this possible as no other herbicide in American agriculture possesses its unique attributes. In addition, scientists from many disciplines have researched glyphosate products for decades and have provided input to EPA to help prevent any unreasonable adverse effects to human health and the environment.

As EPA has engaged in more recent years with additional analysis towards compliance with the Endangered Species Act (ESA), like other ESA assessments issued by EPA, the glyphosate BE

continues to lack a workable and consistent approach to species assessments. The current documents are:

- Overly complex,
- Incorporate unrealistic modeling assumptions,
- Fail to meet the stated goals of EPA's revised methods,
- Lack transparency, and
- Result in an assessment which does little to distinguish which species may truly benefit from possible label changes.

An assessment process which essentially equates **ANY** exposure to a pesticide as a possible concern for species does little to advance appropriate options which could be tailored to improve species protection.

The implications of unrealistic analyses will result in unjustified restrictions on the use of glyphosate products which remain critical weed management tools across the U.S.

WSSA areas of concern include:

- The glyphosate BE fails to incorporate best available science and lacks a quantitative weight of evidence approach which are critical to a reliable assessment of possible species risk. Probabilistic methodologies have been recommended, and promised, for many years, yet assessments continue to lack these refinements.
- EPA has not responded to past comments raising grower concerns about the problems with EPA's process for conducting pesticide BE's as part of the registration review process. These problems include use of results and conclusions based on data that does not meet the rigor and objectivity required, failure to use probabilistic methods, failure to use a rigorous weight of evidence approach, and using overly conservative ecological endpoints to identify possible concerns.
- EPA, in effect, moves the responsibility to make accurate and realistic assessments to other agencies (the US Fish and Wildlife Service and the National Marine Fisheries Service [the Services]). The Services are understaffed and generally unfamiliar with the registration evaluation process EPA conducts under FIFRA – further adding to the likelihood of unrealistic, and overly simplistic conclusions.
- There is little evidence in the glyphosate BE documents that EPA has established that pesticide exposure at a concentration causing adverse effects is reasonably certain to occur, and the BE does not incorporate available geographic use data to refine assessments of possibly impacted areas.

EPA should make a significant effort in the final glyphosate BE to **reduce the level of compounding conservatism** in the assessment. EPA's use of worst-case scenarios throughout the assessment and the use of overly conservative assumptions accumulate in

the analysis in a way that greatly exaggerates the effect of glyphosate on endangered and threatened species. EPA should adjust the approach to more accurately incorporate use and usage information, and strive to better establish whether pesticide exposure at a concentration potentially causing adverse effects is reasonably certain to occur.

As EPA completes its registration review process for glyphosate, WSSA wants to stress that glyphosate has large and significant benefits to growers across the country. We have attached letters on current glyphosate use patterns and the importance of glyphosate in integrated weed management plans from some of our leading weed science experts:

- Dr. Brad Hanson, University of California- Davis (p. 4)
- Dr. Tom Getts, University of California Cooperative Extension (p. 5)
- Dr. Corey Ransom, Utah State University (p. 6)
- Dr. Brian Mealor, University of Wyoming (p. 7)
- Dr. Matthew Bertucci, University of Arkansas (p. 8)
- Dr. Rodrigo Werle, University of Wisconsin-Madison (p. 9)
- Dr. Travis Legleiter, University of Kentucky (p. 10)
- Dr. Michael Flessner, Virginia Tech (p. 11)
- Dr. Kurt Vollmer, University of Maryland (p. 12)
- Dr. Lynn Sosnoskie, Cornell University (p. 13)
- Dr. Charlie Cahoon/Dr. Wesley Everman, North Carolina State University (p. 14)
- Dr. Mike Marshall, Clemson University (p. 15)
- Dr. Wayne Mitchem, Southern Region Small Fruit Consortium (p. 16)
- Dr. Joseph C. Neal, North Carolina State University (p. 17)

A clear pattern throughout these experts' letters is that actual glyphosate use rates rarely exceed half the maximum labeled rate, especially in non-agricultural areas such as pastures and rangelands where endangered species habitat may be more prevalent. WSSA encourages EPA to revisit its ecological endpoints determinations provided in the draft BE, update its approach and methodologies to incorporate the most recent and best available data, and employ a rigorous quantitative weight of evidence approach. Decades of scientific research has clearly shown that the benefits of glyphosate outweigh any potential ecological risks.

The WSSA understands the complexity of ESA and respects the challenges that ESA poses to the EPA. The WSSA is committed and hopeful for the opportunity to work directly with EPA to provide scientific input to assist in the development of recommendations that protect the pesticide user, the environment, and the consumer while effectively feeding and clothing the world.

Sincerely,



Dr. J. Anita Dille
President, Weed Science Society of America

UNIVERSITY OF CALIFORNIA, DAVIS

BERKELEY • DAVIS • IRVINE • LOS ANGELES • MERCED • RIVERSIDE • SAN DIEGO • SAN FRANCISCO

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COLLEGE OF AGRICULTURAL AND
ENVIRONMENTAL SCIENCES
AGRICULTURAL EXPERIMENT STATION
COOPERATIVE EXTENSION

March 11, 2021

To: Dr. Lee Van Wychen, Executive Director of Science Policy, National and Regional Weed Science Societies

From: Brad Hanson, Cooperative Extension Weed Specialist

Re: Glyphosate use in California tree and vine crop sector

Glyphosate is an important component of the chemical weed control programs used on the nearly 3 million acres of orchard and vineyard production systems in California. In every crop in this sector, which includes tree nuts, stone fruits, pome fruits, citrus, as well as many other specialty tree crops such as olive, fig, date, avocado, glyphosate is the most widely used herbicide active ingredient on a treated-acre basis.

In the mild climate of California and under our irrigated production systems, weeds are managed throughout the year. In contrast to many other crops, orchard and vineyard growers commonly use fairly intense herbicide programs within the tree or vine row ("the strips") and much less chemically-intensive or physical-only programs between the rows. The width of these treated strips varies among crops, crop age, and grower preference but is commonly 25-50% of the gross acreage.

In most cases, preemergence herbicide programs are utilized during the fall and winter, when rainfall is sufficient to incorporate the herbicides and these treatments often also include glyphosate to manage existing weeds. Weed control in these treated zones is often supplemented with spring "burndown" treatment that would also commonly include glyphosate, especially if perennial weeds such as field bindweed, yellow nutsedge or Johnsongrass are present. Tree crops such as almond, walnut, and fig that are harvested from the orchard floor also routinely are treated with a "preharvest" herbicide program of the entire orchard floor to improve crop quality and facilitate mechanical harvest operations.

Although the diversity and scale of this crop sector make it difficult to summarize easily, a reasonable estimate is that most California orchard acres are treated 1-3 times per year with a glyphosate-containing herbicide program. The most common use rates range from 1-2 lb ae/A for treatments made with conventional sprayers. The equipment used to apply glyphosate in orchards and vineyards is primarily pull-behind sprayers that spray one side of two tree rows in each pass at relatively low speeds so drift outside of the treated field is not common. Some growers supplement weed control during the growing season with "spot" treatments made with backpack or ATV sprayers which would have higher concentration but much lower treated acreage.

Best regards,

A handwritten signature in black ink that reads "Brad Hanson".

Bradley D. Hanson
Specialist in Cooperative Extension
Department of Plant Sciences
UC Davis

March 8th, 2021

Dr. Van Wychen,

Glyphosate is a fundamental, irreplaceable tool for weed management systems in the Intermountain Region of California. It is routinely used for weed control prior to planting any of the major crops in the area: alfalfa, grass hay, small grains, onions, potatoes and pasture. No other weed control tool provides control of both annual and perennial grasses and forbs without any plant back restrictions. Being able to seed immediately after controlling weeds, or even after seeding prior to crop emergence, is a characteristic unique to glyphosate. In cropping systems, glyphosate is routinely used from 12oz-44oz of product/acre.

Additionally, glyphosate is a key tool for the thousands of acres of Roundup Ready Alfalfa production systems. Weed control tools in alfalfa are limited, and the Roundup Ready systems gives producers a tool to control tough perennial weeds that would contaminate hay and devalue the agricultural product. Use rates in RR alfalfa range from 16- 32oz/acre.

In rangelands and natural areas, glyphosate is routinely used in spot treatments to control undesirable perennial weeds. It provides excellent control of most vegetation mixed at 1.5% volume to volume. Noxious weeds are a tremendous problem on our federal lands. Currently many of the federal weed control projects limit what herbicides can be used to control invasive vegetation next to waterways. Glyphosate with an aquatic label is often the only product currently being used on these federal projects within certain buffers from streams.

Woody vegetation is also often targeted with applications of glyphosate, as cut stump treatments of undiluted product applied directly to the cambium. Like spot treatments described above, cut stump applications are very targeted, and preferred by land managers seeking to limit the amount of collateral damage to surrounding vegetation.

Sincerely,



Tom Getts
UC ANR Weed Ecology and Cropping Systems Advisor



Utah State University

Department of Plants, Soils, and Climate

March 12, 2021

To: Dr. Lee Van Wychen, Executive Director of Science Policy, National and Regional Weed Science Societies
From: Corey Ransom, Utah State University Extension Weed Specialist
Re: Glyphosate use in Pasture/Rangeland/CRP

The use of glyphosate is critical for weed management in pasture, rangeland, and CRP. In general removing invasive grasses from desirable grasses is challenging. On rangeland, invasive annual grasses (i.e. cheatgrass, medusahead, ventenata, etc.) continue to invade and degrade native plant communities and have reduced fire cycles to every 3 to 5 years. The failures to control invasive annual grasses on range further endangers critical habitat for numerous species including the sage grouse. The battle against these invasive annual grasses requires the use of many different management approaches and options. Glyphosate is especially critical for use in controlling invasive annual grasses due to the absence of any soil residual activity that might limit the establishment of desirable seeded species used for site restoration. It is also critical for its ability to control invasive annual grasses selectively on sites with existing desirable perennial plants.

Glyphosate is usually applied at extremely low rates and in late winter or early spring while desirable vegetation is dormant allowing for the removal of invasive annual grasses, with limited impact to desirable perennial grasses and forbs. The use rates allowed for selective control range from 0.28 to 0.39 lb ae/acre in pasture and rangeland and 0.18 to 0.28 lb ae/acre in CRP. The amount of acreage treated is usually small as the application timing window can be very short and limited to the time after the snow melts, when the area is dry enough to travel across and the perennial plants have not broken dormancy. In addition, the cost of making each herbicide application in relation to the value of the crop/range would limit the number of applications to one per season or even one every few years in most settings. While higher rates (2.25 lb ae/acre) may be used in renovation of highly degraded sites (comprised of nearly 100% annual invasive grasses), such applications are less common as re-establishment of pasture/range/CRP can be very difficult and costly.

In pasture, annual grass control can be achieved with soil residual herbicides. However, preemergence products can be challenging to apply at the right time, prior to invasive annual grass germination. The use of glyphosate allows the producer to evaluate the weed problem before choosing to treat because it is applied postemergence, which allows a more iterative and judicious approach to herbicide use.

From my experience of working with producers and land managers on many levels, I would estimate only a small percentage (maybe 5 to 10%) of these areas are treated within a given year. Out of the acreage treated I would estimate that less than 25% of the treatments applied to pasture/rangeland/CRP include glyphosate in a given year.

Glyphosate remains an invaluable tool in controlling invasive weeds in crop and non-crop settings.

Sincerely,

Corey Ransom
Associate Professor and Extension Weed Specialist



College of Agriculture and Natural Resources
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March 12, 2021

To: Dr. Lee Van Wychen, Executive Director of Science and Policy, National and Regional Weed Science Societies

Re: Glyphosate use in Rangelands/Pasture/Conservation Reserve Program Lands

Dr. Van Wychen:

Thank you for request for information regarding glyphosate use in rangelands, pastures, and CRP lands in the western United States. While we have a suite of herbicides available for use in these systems, glyphosate fills a niche that others do not – making it an important tool for managing invasive and noxious weeds in these settings. While the impacts of invasive annual grasses are receiving much warranted attention recently, invasive plants of other plant functional groups also continue to impose negative impacts to the ecosystem goods and services that we receive from these ecosystems: biological diversity, wildlife habitat, forage for livestock, water cycling, and others.

Use rates per acre vary across these site types based on various factors. Overall, glyphosate is not used as prevalently or consistently in perennial forage systems (rangelands, pasture, CRP), as it may be in annual cropping systems. In many cases, it serves a specialized role and, as such, is probably used on only a small fraction of rangelands and pastures in the region. As a short-residual, post-emergent herbicide, glyphosate is used to control invasive annual grasses when those winter annuals are actively growing, yet many perennial plants are still dormant in early spring. Use rates in the range of 0.15-0.35 lb ae/acre are often seen with such programs. When renovating improved pastures (a practice perhaps done every 10 years in many parts of the West), higher rates (1.5-2 lb ae/acre) may be used as burndown prior to seeding new desirable species. Additionally, much of the glyphosate use in naturally-occurring rangeland vegetation would fall under spot treatments approaches – where the glyphosate concentration in solution may be higher, but the total amount of active ingredient per acre is relatively low compared to some applications in other systems.

I would summarize glyphosate's use in rangelands, pasture, and CRP lands in our region as relatively low-frequency that often occurs in special purpose applications for selective control of annual grasses, burndown prior to reseeding, or in spot treatments for concentrated areas of some noxious weed species. Please let me know if I can help with any other additional information.

Grace and peace,

A handwritten signature in blue ink that reads "Brian A. Mealor".

Brian A. Mealor
Director, Sheridan Research and Extension Center
Institute for Managing Annual Grasses Invading Natural Ecosystems
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Dr. Van Wychen,

Glyphosate is an extremely valuable and low-risk herbicide used in a diversity of cropping systems in Arkansas. Of course row crops with glyphosate tolerance constitute a large fraction of the use-acres. But there are many other systems where glyphosate is utilized for broad-spectrum weed control. Specific acreages and examples are listed below.

In Arkansas, there are 1.2 million acres of hayland production, with an additional 4.5 million acres of pasture. Thus, herbicide restrictions in these systems will affect more acres than any other agricultural commodity crop in the state. Because the state lies in a transition zone, forage material varies from north to south. Bermudagrass and tall fescue are predominant in the northern portions of the state, while bahiagrass is more common in the southern parts of the state. Typically, pastures weeds are controlled with a nonselective herbicide when desirable forages are dormant. Many other weed control options exist, but glyphosate applied just before green-up is the most common and most critical form of weed control for these producers. Glyphosate is typically applied at 0.25 lb ae per acre in these systems.

Arkansas has over 18,000 miles of managed US roadways, requiring various levels of maintenance. Vegetation must be managed along these rights away to maintain visibility and sustain safe roadside conditions for disabled vehicles. Maintenance along these roads constitutes approximately 160,000 acres of land. A diversity of vegetation management strategies exist, depending on application timing and vegetation present. But it is common to apply 0.25 to 0.5 lb ae per acre of the glyphosate.

Specialty crop acreage is less prominent in Arkansas, but fruit and vegetable production still play a major role in local economies. The value of this affordable and effective herbicide for many small farmers cannot be overstated, even for use spot-spraying weeds. Conventional specialty crop producers rely heavily on the use of glyphosate to prepare fields for planting. It is most commonly used as a preplant burndown application. Glyphosate is also used to terminate cover crops in no-till or reduced till production systems. Rates vary greatly from crop to crop and for different applications. Rates could range from 0.25 to 0.75 lb ae per acre.

Sincerely,



Dr. Matthew B. Bertucci



Department of Agronomy

UNIVERSITY OF WISCONSIN-MADISON

March 10, 2021

Dear Dr. Lee Van Wychen,

The herbicide glyphosate represents the foundation for burndown and postemergence weed control in soybean and corn production systems in Wisconsin and beyond. Despite the widespread occurrence of glyphosate-resistant waterhemp in our geography, I estimate that >90% and >60% of our soybean and corn acres in Wisconsin still receive at least one application of glyphosate per year. Glyphosate is a systemic, non-selective and cost-effective option which provides growers with excellent control of established grass and non-glyphosate-resistant broadleaf species commonly found in our cropping systems (e.g., foxtail species, barnyardgrass, wild-proso millet, ragweed species, common lambsquarters, redroot pigweed, velvetleaf, etc). The standard rate of glyphosate per application used in Wisconsin soybean and corn production systems ranges from 0.75 to 1.12 lbs acid equivalent per acre.

Please do not hesitate to contact me if you have questions or would like additional information.

Sincerely,

Rodrigo Werle, PhD

Assistant Professor & Extension Cropping Systems Weed Scientist
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March 9, 2021

Dr. Van Wychen,

Glyphosate continues to be used on the majority of Kentucky corn, soybean, and wheat acres. Despite numerous species of glyphosate resistance in the state, glyphosate continues to control the majority of the weed species spectrum that occurs in Kentucky's three major row crops.

A large proportion of the corn, soybean, and wheat acres in Kentucky are no-tillage or reduced tillage and require a burndown application prior to planting. Glyphosate is the primary herbicide used for burndown of weeds prior to planting of all three crops and is often tank mixed with other foliar active herbicide and/or soil residual herbicides. Typical use rates of glyphosate for burndown in all three crops ranges from 1.13 to 1.5 lb ae glyphosate per acre, with the majority occurring at the higher rate.

Corn and Soybean with glyphosate resistant traits are planted on the majority of Kentucky corn and soybean acres. Glyphosate is still widely used on both crops for postemergence control of a variety of weed species such as foxtails, Johnsongrass, crabgrass, susceptible giant ragweed, cocklebur, and smooth pigweed. In fields with glyphosate resistant weed species or tolerant species, glyphosate is typically tank mixed with other foliar herbicide with efficacy on those resistant species. Typical rates of postemergence applications range from 1 to 1.5 lb ae glyphosate per acre. Typically, only one postemergence application is applied to corn and soybean, although there are select acres that may receive a second post emergence application.

Sincerely,

A handwritten signature in black ink, appearing to read 'Travis Legleiter'.

Travis Legleiter
Assistant Extension Professor - Weed Science

seeblue.



March 8, 2021

Dr. Van Wychen,

As an extension specialist in Virginia, I work with farmers, retailers, crop-consultants, and agrochemical companies. I get frequent request for herbicide recommendations and am familiar with farmer practices in our broad acre crops as well as forages (pastures and hayfields).

Glyphosate is a very important herbicide that farmers and ranchers throughout Virginia use to control weeds, facilitating no-till production and helping to protect the Chesapeake Bay. I estimate that glyphosate is used on over 90% of glyphosate tolerant crops in Virginia, including corn, soybean, cotton, and to a lesser extent alfalfa. While we do have weeds such as Palmer amaranth, common ragweed, and horseweed that have become resistant to glyphosate, this herbicide is still effective at economically controlling a plethora of weeds.

Glyphosate is also critical in our forage systems (pasture and hayfields) during renovation. When killing existing vegetation to planting new grass and legume forages, glyphosate economically kills difficult-to-control perennial weeds, that many times would require more expensive herbicides that stay in the soil for longer periods of time.

Glyphosate is typically applied at 0.75 to 1.0 lb ae/a in glyphosate tolerant crops and is most commonly applied twice, once before planting and once over-the-top. During forage renovation, glyphosate is most commonly applied at 1.5 to 2.0 lb ae/a followed by 1.0 to 1.5 lb ae/a. Forage renovations are rare and occur less than once in ten years.

I urge the US EPA to evaluate current glyphosate product labeling as well as current user practices when accounting for the risk of glyphosate in the environment and elsewhere. I fully support following science and the data in order to minimize or eliminate risk while allowing for the benefits a product such as glyphosate can provide.

Thanks for the opportunity to provide my comments. Sincerely,

Michael Flessner, PhD
Associate Professor and Extension Weed Science Specialist
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March 11, 2021

Dr. Lee Van Wychen
Executive Director of Science Policy
Weed Science Society of America
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Dear Dr. Van Wychen,

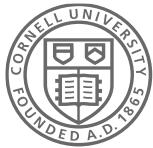
Glyphosate is still an important tool for controlling weeds in Maryland. We estimate that 95% of our corn and soybean acreage gets at least one application of glyphosate. However, multiple applications are common, with 85% of farmers applying glyphosate at least twice per season and 40% of farmers applying glyphosate at least 3 times per season. The typical application rate is 1 to 1.5 lbs/A. Furthermore, over 500,000 acres of cover crops are planted each year in Maryland, with glyphosate being the primary method for terminating these cover crops.

In addition to agronomic crops, 70% of about 300 nurseries in Maryland make 1 to 3 glyphosate applications a year. Statewide, 250 gallons of glyphosate are used on county roads each year to control johnsongrass and other invasive species, and an estimated 2500 gallons are used for weed management along guardrails.

Sincerely,



Kurt M. Vollmer, Ph.D.
Extension Specialist-Weed Management
University of Maryland



March 11, 2021

To: Dr. Lee Van Wychen, Executive Director of Science Policy, National and Regional Weed Science Societies

From: Lynn Sosnoskie, Assistant Professor of Weed Science, Cornell University

Re: Glyphosate use in New York

Dr. Van Wychen,

Glyphosate is an important, herbicidal active ingredient used across multiple commodities in New York State. This includes agronomic and horticultural cropping systems, plus nurseries, Christmas trees and other short rotation woody crops, and sod. According to the 2017 Census of Agriculture, New York State has 6.9 million of acres in farmland that are distributed across 33,438 producers (mean of 205 acres). More than 50% of farms are less than 180 acres in size. Glyphosate is also used in landscapes and other non-cropped areas for the control of unwanted vegetation.

Because glyphosate is applied in a diverse number of crops and environments, its use patterns and rates can also vary, making the product's important difficult to summarize. For example, discussions with a berry extension specialist indicate that berry growers may use glyphosate at 2-3 quarts per acre for site preparation and then use a 33% solution as a wipe on woody vegetation. Tree fruit growers may use glyphosate products in mature and established orchards at 2-3 quarts per acre, once a season, in problem blocks (i.e. with perennial weeds). Grapes will mainly apply before or just after budbreak at a rate of 2 quarts per acre of formulated product. Many perennial fruit growers will avoid applications later in the season when the active ingredient could be translocated to roots to prevent unintentional injury to the crop; this includes post-harvest treatments. In select field and forage crops, glyphosate may be part of a weed control program pre-plant, in-crop (glyphosate-tolerant varieties), and post-harvest, resulting in, potentially, 3 to 4 applications of at least 1 quart per acre. Depending on the formulation used, these rates amount to 0.75 to 1.5 lb ae per acre. Spot treatments in non-cropped areas would range from 1 to 2 lbs ae per acre.

Regards,

Lynn M. Sosnoskie

March 9, 2021

Dr. Lee Van Wychen
Executive Director of Science Policy
National and Regional Weed Science Societies

Dr. Van Wychen,

Glyphosate is an integral component of weed management in North Carolina corn, cotton, soybean, and small grains production. We estimate 95 to 100% of corn and cotton, 92% of soybean, and 67% of small grains acres in North Carolina receive at least one application of glyphosate annually. Glyphosate is primarily used preplant burndown and postemergence for control of many grass and broadleaf weeds.

Glyphosate is normally applied at 0.75 to 1.125 lb ae per acre to row crops produced in North Carolina. Corn and soybean likely receive two applications whereas glyphosate is typically applied three times to cotton. Glyphosate use is limited to one preplant burndown application prior to planting winter small grains.

Sincerely;



Dr. Charlie Cahoon
Assistant Professor and
Extension Weed Specialist: Corn and Cotton
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Dr. Wesley Everman
Associate Professor
Extension Weed Specialist: Soybean
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EDISTO RESEARCH AND EDUCATION CENTER

College of Agriculture, Forestry and Life Sciences

[3/11/21]

Dr. Van Wychen
Executive Director of Science Policy
National and Regional Weed Science Societies

RE: Glyphosate use in selected crops in South Carolina

Dear Dr. Van Wychen,

I am writing this letter to document the approximate glyphosate use in crops that I am familiar with in the state of South Carolina. In glyphosate-tolerant row crops (i.e., corn, soybean, cotton), there are typically three applications made per season (1 burndown preplant and 2 postemergence applications). The common application use rate for glyphosate in those crops are 1 qt per acre. That would calculate to around 600,000 gallons (2.7 million pounds glyphosate acid) of glyphosate applied annually based on the acreage estimate for those three crops. In non-glyphosate tolerance crops (i.e., peanuts, wheat, grain sorghum, forages, tobacco), there is one application prior to planting of the crop (preplant burndown) of the previously mentioned glyphosate application rate. This adds up to 37,500 (168,750 pounds glyphosate acid) gallons annually. In tree crops, glyphosate is used during renovation (broadcast over entire area to be planted) before planting and during the first few years of establishment (directed application between the trees). There are approximately 13 million acres of forest land in South Carolina. Of that total, 11% or 1.5 million acres is under commercial production where glyphosate applications would occur. Typical application rates of glyphosate if tree crops are 32 to 64 fl oz per acre, depending on the weed and 1 application per season. The total amount of glyphosate potentially used in tree crops is 48 to 96 million gallons (216 to 432 million pounds of glyphosate acid) per year. It should be noted that not all the acreage above receives a glyphosate application every year, that figure is closer to 1/100 of the amount shown above.

Sincerely,

Dr. Mike Marshall
Extension Weed Specialist
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(803) 522-1415

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March 11, 2021

Lee Van Wychen, Ph.D.
Executive Director of Science Policy
National and Regional Weed Science Societies
5720 Glenmullen Pl, Alexandria, VA 22303

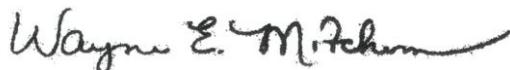
Dr. Van Wychen,

I am an Extension Associate with NC State University who provides weed control/herbicide recommendations and addresses grower issues related to weed management in commercial orchards and vineyards in NC, SC, and GA. NC State has a memorandum of understanding with Clemson University and the University of Georgia allowing me to work across state lines with Cooperative Extension professionals and commercial fruit growers in all three states.

Glyphosate is an important herbicide used by apple, peach, and grape growers throughout the Southeastern United States. Over the past four to five years growers have reduced their utilization of glyphosate in orchard and vineyard crops compared to what it was 10 years ago. Application use rates range from 1 to 1.375 lb ai/A per application. In apple and vineyard crops only 1 to 2 applications are used however many growers are limiting that to only 1 application per year. Glyphosate utilization in peach orchards has always been less than its utilization in apple orchards and grape vineyards due to peach tree sensitivity to glyphosate. Since glufosinate was cleared for use in peach several years ago glyphosate use in peach orchards has declined with many producers using no glyphosate at all.

In the even you have any additional questions please do not hesitate to contact me. My cell phone number is 704-472-4369 or you can email me at wayne_mitchem@ncsu.edu.

Sincerely,



Wayne E. Mitchem
Extension Associate, Orchard and Vineyard Weed Management
Coordinator, Southern Region Small Fruit Consortium



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March 9, 2021

Lee Van Wychen, Ph.D.
Executive Director of Science Policy
National and Regional Weed Science Societies
5720 Glenmullen Pl, Alexandria, VA 22303

Dear Dr. Van Wychen:

I am writing in response to your request for information on glyphosate use patterns in non-crop areas. My area of expertise is weed management for urban landscapes and in nursery crop production. Glyphosate is an important weed management tool in both settings. It is the most widely used herbicide in urban landscapes, and there are truly no other herbicides that fit the use pattern. Other herbicides and natural products kill weeds, and can be used in landscapes and urban parklands. But, none have the combination of systemic action, broad spectrum weed control, no residual soil activity, low mammalian toxicity, low toxicity to aquatic organisms, ease of use, and low cost. Glyphosate is one of the most effective control options for many invasive plants common in urban greenways.

In urban landscapes and green spaces, glyphosate is typically applied as a “spot” treatment, meaning that only the weeds are sprayed. Recommended doses of glyphosate range from 1% to 4% (by volume) of the standard formulation (4 lb glyphosate per gallon) in water. In landscape plantings a 2% solution is most common. Commercial landscape maintenance staff will typically make spot applications of glyphosate on an as-needed basis. This often means any given property may receive spot treatments 3 to 6 times a year, depending on the weed populations. Where weeds are throughout the area and a broadcast application of the herbicide is needed, a dose of 2 lb ai/A is generally recommended. It is rare for a broadcast application of glyphosate to be made in urban landscapes, except when removing vegetation to prepare an area for a new planting.

In field nursery crop production, glyphosate is applied as a directed spray to the crop rows, treating a band of about 20 inches on either side of the crop row. Row middles are not sprayed unless perennial weeds are present that require treatment to protect the crops. Typical doses applied are between 2 and 3 lb ai/A. These banded applications are usually applied 2 times a year with spot treatment of problem weeds as needed. While glyphosate is the most widely used postemergence herbicide in field grown nursery crops, many growers do use other options including glufosinate or gramoxone. These alternative treatments are more expensive and less effective, requiring more applications. However, their use is increasing to combat glyphosate-resistant weeds. Based on a recent survey, over 80% of field nursery crop producers reported herbicide resistance weeds were present on their properties and 70% noted that herbicide resistant weeds had increased their production costs. Thus, we can anticipate that glufosinate use will increase in the future but glufosinate does not control perennial weeds as well as glyphosate; thus, glyphosate will continue to be an important weed management tool for nursery crop producers.

Glyphosate is also a valuable tool for weed control in container nurseries, for sanitation practices around the nursery. It is typically applied as a spot treatment to emerged weeds. Growers will make these applications about once every 6 weeks. The dose used is typically a 2% by volume mixture. Glyphosate is still the most effective and widely used herbicide for this purpose because the competing products lack efficacy on spotted spurge, the most common summer annual weed in container nurseries.

North Carolina is the leading producer of Fraser fir Christmas trees. Fraser fir are exclusively grown at high elevation on well-drained but erodible soils. To combat erosion the growers employ a living ground cover system to suppress weeds. The ground cover is dominated by white clover and other perennial dicot forbs. Low doses of glyphosate are used to control perennial grasses and annual weeds in the clover ground cover. Fraser fir trees are uniquely tolerant of glyphosate used in this manner. This glyphosate-bases ground cover suppression program is applied to over 50% of the southern Appalachian Fraser fir fields. A typical treatment regimen is 8 oz glyphosate product per acre in May, a second application at 4 to 6 oz / Acre in mid-June. [Doses are given as ounces of the 4 lb/gallon formulated product per acre.] The May and June applications are broadcast-applied to the entire production field. In August or September, perennial weeds are spot treated with a higher dose of glyphosate. Research has been conducted to find alterantives to glyphosate for this use, but no alternatives are currently available that provide the same levels of tree safety, weed control, and safety to the living ground cover.

I hope these comments are useful in understanding the important role glyphosate products play in weed management practices for urban green spaces, nursery crops and southern Appalachian Christmas tree production.

Sincerely,

A handwritten signature in cursive script that reads "Joseph C. Neal".

Joseph C. Neal, Ph.D.
Professor of Weed Science