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United States Department of Agriculture
1400 Independence Ave, SW
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Submitted electronically via Federal eRulemaking Portal

RE: Request for Comments: Executive Order on Tackling the Climate Crisis at Home and Abroad (USDA-2021-0003-0001)

Dear Dr. Meyer,

We represent a broad group of stakeholders, including growers, landscapers, retailers, manufacturers, distributors, crop consultants, and applicators, all of whom have a strong interest in continued access to safe, affordable, effective pesticide products. We appreciate the opportunity to comment regarding the Request for Information (RFI) on USDA's Climate-Smart Agriculture and Forestry Strategy, as directed by the *Executive Order on Tackling the Climate Crisis at Home and Abroad*, and would like to speak to the ways pesticides are currently playing a significant role in combatting climate change. As we discuss below, the current climate benefits of these tools are substantial and quantifiable. Moreover, we believe by pursing common-sense, risk-based policy improvements to pesticide policy, grounded in sound-science, we can further improve the potential these tools have as part of the solution to address climate change.

As the discussion on climate change has unfolded, many conservation practices have been examined which can reduce greenhouse gas emissions, sequester carbon, or improve resiliency to climate change. What is often underdiscussed, however, is how some of the most promising conservation practices for addressing climate change are highly contingent on the availability of safe, effective pesticides. For example, growers who use reduced tillage must continue to contend with weeds; they often need to manage insects that may refuge in cover crops or residue; and they still must terminate cover crops prior to planting a primary crop. While non-chemical methods exist to manage some of these pest pressures or terminate cover crops, these methods are unlikely to be scalable due to significant reductions in crop yields associated with their use compared to conventional production.[1,2] Offsetting these yield reductions would require significant land conversion to production acres to grow the same amount of food,[3] to say nothing of meeting the expanding food needs of a growing global population. If land entering production to compensate for these yield reductions is climate-critical and environmentally-sensitive – such as rainforest land[4] – the climate consequences could be dire.

[1] Delate, Kathleen, Cynthia Cambardella, and Jeff Moyer. August 19, 2013. "Organic No-Till Grain Production in the Midwest." *eOrganic*. https://eorganic.org/node/7681

[2] United States Department of Agriculture. National Agricultural Statistic Service. January 2021. *Crop Production 2020 Summary*. https://downloads.usda.library.cornell.edu/usda-esmis/files/k3569432s/w3764081j/5712n018r/cropan21.pdf

[3] Smith, Laurence G., Guy J.D. Kirk, Philip J. Jones, and Adrian G. Williams. October 22, 2019. "The greenhouse gas impacts of converting food production in England and Wales to organic methods." *Nature Communications.* https://www.nature.com/articles/s41467-019-12622-7

[4] Gibbs, H.K., A.S. Ruesch, F. Achard, M.K. Clayton, P. Holmgren, N. Ramankutty, and J.A. Foley. September 21, 2010. "Tropical forests were the primary sources of new agricultural land in the 1980s and 1990s." *Proceedings of the National Academy of Sciences of the United States of America.* https://www.pnas.org/content/107/38/16732

For these reasons, an increasing volume of scientific literature has assessed that climate-smart agricultural inputs, such as safe and effective pesticides, can help sustain conservation practices that may otherwise be difficult to accomplish on a large scale. A 2020 study found that just two herbicide-tolerant crops in the United States – corn and soybeans – and their companion chemistries enabled reductions in tillage and reduced tractor fuel use to sequester carbon and reduce greenhouse gas emissions by removing the equivalent of 4.2 million cars from roadways in one year.[5] What is more, there is significant opportunity for increasing the climate potential of these tools and the practices they support. A separate 2020 analysis found if cover crops were grown on an additional 15 percent of available U.S. cropland acres and if 25 percent of intensive or reduced tillage acres were converted to strip tillage or no-till soil management practices (again, practices largely enabled by access to safe, effective pesticides), an additional 29.6 million metric tons (MMT) of carbon equivalent – or the equivalent of approximately 6.4 million cars – could be reduced annually.[6]

There are other ways in which pesticides help to reduce climate risks and establish climate resiliency. Urban trees, which in 2005 were estimated to sequester the equivalent of 643 MMT of carbon,[7] face increased pest pressures compared to rural trees.[8] These pressures are expected to intensify in the face of climate change,[9] and thus safe and effective pest management tools will be required to protect this important urban carbon sink. The U.S. Forest Service also reports pesticides are used to protect our nation's forests – which offset approximately 16 percent of our nation's carbon dioxide emissions[10] – from devastating pests. Pesticides have been used to slow the spread of gypsy months and emerald ash borer in our forests by up to 50 percent,[11] ensuring these important sinks can continue to serve this vital offset function. Additionally, as higher temperatures and changes in precipitation increase the ranges and incidences of insect, fungal, rodent, and other pests that can harm agriculture, forests, or human health, control tools will be essential for establishing resiliency to these heightened pest pressures.[12]

While we appreciate the interest of the RFI is largely focused on how agriculture can address climate change, it is important to note that pesticides have a variety of additional conservation benefits that can improve the sustainability of agriculture. For example, reductions in tillage, largely enabled by pesticide use, can significantly reduce soil erosion.[13] These same practices can also improve nutrient retention, enhancing

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[5] Brookes, Graham, and Peter Barfoot. July 24, 2020. "Environmental impacts of genetically modified (GM) crop use 1996–2018: impacts on pesticide use and carbon emissions." *GM Crops & Food.* https://www.tandfonline.com/doi/full/10.1080/21645698.2020.1773198

[6] Bruner, E. J. Moore, M. Hunter, G. Roesch-McNally, T. Stein, and B. Sauerhaft. 2020. *Combatting Climate Change on US Cropland: Affirming the Technical Capacity of Cover Cropping and No-Till to Sequester Carbon and Reduce Greenhouse Gas Emissions*. https://farmland.org/wp-content/uploads/2020/11/csequestrationreach-converted.pdf

[7] Nowak, David J. United States Department of Agriculture. United States Forest Service. 2013. *Research Highlights: Carbon Sequestration by Urban Trees Valued in the Billions of Dollars Annually*. https://www.fs.fed.us/research/highlights/highlights_display.php?in_high_id=472

[8] Dale, Adam G., and Steven D. Frank. October 1, 2014. "Urban warming trumps natural enemy regulation of herbivorous pests." *Ecological Applications.* https://esajournals.onlinelibrary.wiley.com/doi/full/10.1890/13-1961.1

[9] Dale, Adam G., and Steven D. Frank. March 9, 2017. "Warming and drought combine to increase pest insect fitness on urban trees." *PLOS ONE.* https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0173844

[10] United States Department of Agriculture. United States Forest Service. Office of Sustainability and Climate Change. May 2016. *Forest Carbon & Climate Change: How is Carbon Affected?* https://www.fs.usda.gov/sites/default/files/factsheets-forestcarbon.pdf

[11] United States Department of Agriculture. United States Forest Service. *Research & Development: Pesticides.* Updated: May 13, 2015. https://www.fs.fed.us/research/invasive-species/control/pesticides.php

[12] Walsh, M. K., P. Backlund, L. Buja, A. DeGaetano, R. Melnick, L. Prokopy, E. Takle, D. Todey, L. Ziska. United States Department of Agriculture. Climate Change Program Office. 2020. *Climate Indicators for Agriculture*. 29-30, 33-34. https://www.usda.gov/sites/default/files/documents/climate_indicators_for_agriculture.pdf

[13] Kellogg, Robert. United States Department of Agriculture. Natural Resources Conservation Service. November 2017. *Effects of Conservation Practices on Water Erosion and Loss of Sediment at the Edge of the Field*. 12-13. https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcseprd1365654.pdf

watershed quality.[14] The use of herbicides in site preparation can also lead to improved pollinator habitat compared with pollinator habitats not prepared with herbicides.[15,16] While not necessarily climate-related, it is worth noting these pesticide-derived benefits can help to improve the quality and health of our natural resources, wildlife, and environment.

While it is clear there are significant existing climate mitigation and resiliency benefits derived directly from pesticides, or indirectly through the various conservation practices they enable, there is also room for growth. These tools can play an even greater part of the climate solution by pursuing various common-sense policy improvements. While the below recommendations are not an exhaustive set of proposals to improve the use or rate of adoption of various conservation practices to address climate change through agriculture, these are a set of common-sense, pragmatic ideas USDA can use to improve and optimize the climate benefit potential of pesticides in that solution.

1.A.1. How can USDA leverage existing policies and programs to encourage voluntary adoption of agricultural practices that sequester carbon, reduce greenhouse gas emissions, and ensure resiliency to climate change?

Access to Safe, Effective Pest Control Tools

First and foremost, pesticide users require access to a broad array of safe, effective, and well-regulated pesticidal products to maintain conservation practices and manage both existing and emerging pest pressures. As mentioned above, the latter need will only increase due to climate change, as pests have increased opportunity to migrate to new, previously inhospitable areas and have longer seasonal reproductive cycles due to longer, warmer seasons.[17] Reduced access to fewer products with limited modes of action (MOA) would diminish the ability of users to rotate or mix chemistries to minimize resistance pressures, thus impairing the ability of producers to use certain conservation practices as part of the climate solution.

USDA should continue to work with the Environmental Protection Agency (EPA) and other relevant state and federal agencies to maintain a predictable, timely, science and risk-based regulatory system for these tools to ensure users have access to safe, effective products and guidance for their use. This includes seeking to improve the accuracy and efficiency of the Endangered Species Act (ESA) evaluation and consultation processes for pesticide registration reviews. These much-needed ESA reforms are not only critical for establishing a predictable path to market for new chemistries, but for protecting and rehabilitating threatened and endangered species. Maintaining and improving the predictability and timeliness of the regulatory process will equip users with additional new, reduced-impact tools that can enable greater adoption of proven conservation practices, facilitate the development of new practices, and maintain the resiliency of food production in the face of climate change.

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[14] Kellogg, Robert. United States Department of Agriculture. Natural Resources Conservation Service. November 2017. *Effects of Conservation Practices on Nitrogen Loss from Farm Fields*. 16-17. https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcseprd1365657.pdf

[15] Angelella, Gina M., and Megan E. O'Rourke. October 2017. "Pollinator Habitat Establishment after Organic and No-till Seedbed Preparation Methods." *HortScience*. https://journals.ashs.org/hortsci/view/journals/hortsci/52/10/article-p1349.xml

[16] Xerces Society for Invertebrate Conservation. N.D. "Habitat Site Preparation." Accessed April 23, 2021. https://xerces.org/pollinator-conservation/habitat-restoration/site-prep

[17] Walsh, et al. *Climate Indicators for Agriculture*. 29-30.

Increased Technical Assistance

Increasing access to technical assistance from National Resources Conservation Service (NRCS) can help growers and applicators optimize use of conservation practices and the roles pesticides have in their effectiveness. This assistance can help to maximize climate and other environmental benefits while maintaining economically sustainable operations. Increased assistance from NRCS, land grant universities, extension personnel, and certified crop advisors can also help growers to optimize their integrated pest management (IPM) strategies. In turn, this will improve the use of chemistries, biocontrols, rotational practices, and other techniques that can minimize resistance pressures, address new pest challenges, and extend the lifespans of effective pesticides in the face of climate change.

Greater Access to Precision Agriculture Technologies

Precision agriculture can allow pesticide users to make targeted, optimized applications of pesticidal products while maintaining effectiveness of pest management strategies. These technologies can help users reduce overlap of applications, avoid skipping areas, and ensure the best placement and rate of applications. A 2020 study found that precision agriculture equipment had already helped users reduce their application of herbicide by nine percent, or 30 million pounds, and reduce greenhouse gas emissions to the equivalent of 193,000 cars annually, with significant room for growth in both benefit areas with greater adoption.[18] However, these technologies often require up-front capital investment from growers and other users to enjoy the long-term benefits brought by these innovations. USDA should explore cost-share opportunities in USDA programs to assist users in acquiring these conservation-enabling technologies.

Trade Normalization for Residues

A peripheral, yet significant, challenge to conservation agriculture is trade barriers established in export markets. All too often, the establishment of low or zero-tolerance maximum residue limits (MRL) have no risk or scientific basis. Growers rely on these crop protection products as safe, effective tools for protecting the global food supply and maintaining conservation practices. However, when faced with risks to market access and trade disruptions, growers may choose to no longer use that product, and may need to rely on less effective or more costly options. *Codex Alimentarius* (*Codex*) provides a fair, international, science-based MRL standard for most chemistries to ensure residues are safe for human and animal consumption. Foreign Agricultural Service (FAS) has historically partnered well with the U.S. Trade Representative (USTR) and other relevant agencies to urge our trade partners to adhere to *Codex* standards. We strongly encourage USDA continue this cooperative effort, especially given how several climate-smart conservation practices very well depend on these trade normalization outcomes.

D. What data, tools, and research are needed for USDA to effectively carry out climate-smart agriculture and forestry strategies?

Herbicide Resistance Research

One of the most significant threats to several climate-smart agricultural conservation practices, such as reduced tillage, is the emergence and spread of herbicide-resistant (HR) weeds. While researchers and users have developed better IPM techniques in recent years for managing HR weed pressures – such as rotating and layering chemistries with multiple MOAs; managing HR weeds before they can seed and spread; or developing best practices for minimizing the risk of weeds or seeds traveling on equipment, to name a few –

[18] 2020. *The Environmental Benefits of Precision Agriculture in the United States.* https://newsroom.aem.org/asset/977839/environmentalbenefitsofprecisionagriculture-2#.YBdQZR2Lc74.link

greater progress is needed. A 2018 analysis found that the emergence of glyphosate-resistant weed populations resulted in a decrease of conservation tillage and no-till by 6.2 percent and 9.2. percent respectively, subsequently decreasing water quality and climate benefits by an equivalent of $470 million, with further benefit losses accruing by $70 million annually.[19] USDA, land grant universities, and extension services should invest additional resources into researching novel ways to minimize risks of weeds developing resistance to chemistries as well as controlling the spread of HR weeds. Moreover, NRCS should prioritize equipping growers with HR weed management techniques as part of IPM strategy assistance.

Secondary Pest Challenges Resulting from Conservation Practices

As previously discussed, using certain climate-smart conservation practices, such as cover crops or leaving crop residues as a soil cover, can provide refuge for certain insect or fungal pests that may not otherwise be present. Exposure to these novel pest risks can provide a disincentive for adoption of these practices. USDA should invest additional research into mitigating these pest risks. Additionally, NRCS, extension personnel, crop consultants, and or others who interact with growers on IPM strategies should ensure best management techniques related to these conservation practices are being shared with producers.

National Predictive Modeling Tool Initiative

The National Predictive Modeling Tool Initiative (NPMTI), recently established within Agricultural Research Service (ARS), is intended to increase predictive forecasting and modeling tools for diseases and mycotoxins that impact row crops. These tools can enable users to make more informed management decisions, including the need for the use of pesticides and instructing IPM strategies, resulting in improved soil management, precise pesticide applications, among other benefits. We encourage ARS to continue implementation of NPMTI to equip users with better information to predict pest pressures, especially in the face of climate change, to optimize pesticide use and pest management strategies.

Climate Benefit Assessments in Pesticide Registrations

There is a value for pesticide users and other stakeholders in understanding the ways in which various pesticides can be utilized to improve climate and other environmental outcomes. These are important considerations for users who currently and into the future can seek to maximize their environmental sustainability potential by utilizing products that carry established climate benefits. The Office of Pest Management Policy (OPMP) should coordinate with EPA to standardize the consideration of the potential climate benefits of a pesticide in a benefits assessments portion of new registrations, registration reviews, or emergency exemptions, as appropriate for the intended uses of a product.

Continued Research into Precision Agriculture Technologies

As discussed above, precision agriculture is already having a significant impact in optimizing the use of pesticides in conservation agriculture. However, increased research into precision agriculture at the National Institute of Food and Agriculture (NIFA), ARS, land grand universities, and extension services can improve application rates and placement, reduce off-target risks, minimize resistance pressures, among other benefits. We support continued research into precision agriculture, which will help to facilitate greater adoption and the impact of these important climate-smart conservation practices.

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[19] Van Deynze, Braeden, Scott M. Swinton, and David A. Hennessy. 2018. *Are Glyphosate-Resistant Weeds a Threat to Conservation Agriculture? Evidence from Tillage Practices in Soybean.* https://ageconsearch.umn.edu/record/274360/files/Abstracts_R18_05_23_20_49_13_94__67_183_37_102_0.pdf

Conclusion

The science is clear – pesticides already play an important role in helping to combat and establish resiliency to climate change, both directly and indirectly through enabling certain climate-smart conservation practices. However, beyond this existing impact, there seems to be an even greater potential for safe, effective, well-regulated pesticidal products to play a vital part in the climate solution by seeking out practical, common-sense policy improvements. These tools will be essential to the continued success of climate-smart agriculture, especially if USDA is seeking to increase adoption of these conservation practices in a manner where benefits accrue to producers, as the RFI expresses. We appreciate USDA's leadership on this important matter and stand ready to assist the Department and the Administration with implementation of these policy ideas and others that can help to establish a more climate-smart, resilient agricultural economy, both domestically and abroad.

Sincerely,

Agricultural Retailers Association
American Farm Bureau Federation
American Seed Trade Association
American Soybean Association
American Sugarbeet Growers Association
Association of Equipment Manufacturers
California Citrus Quality Council
California Fresh Fruit Association
California Specialty Crops Council
Council for Producers and Distributors of Agrotechnology
CropLife America
Florida Fruit and Vegetable Association
Hop Growers of America
Minor Crop Farmer Alliance
National Agricultural Aviation Association
National Alliance of Independent Crop Consultants
National Association of Landscape Professionals
National Association of Wheat Growers
National Corn Growers Association
National Cotton Council
National Onion Association
National Potato Council
North Dakota Grain Growers Association
RISE (Responsible Industry for a Sound Environment)
U.S. Apple Association
U.S. Hop Industry Plant Protection Committee
USA Rice
Washington Friends of Farms and Forests

CC: The Honorable Michal Freedhoff, Principal Deputy Assistant Administrator, Office of Chemical Safety and Pollution Prevention-Environmental Protection Agency