June 10, 2025

Office of Pesticide Programs Docket
Environmental Protection Agency Docket Center (EPA/DC), (28221T)
1200 Pennsylvania Ave. NW
Washington, DC 20460-0001

RE: EPA's Proposed Decision to Approve Registration for the New Active Ingredient Isocycloseram; Docket ID: EPA-HQ-OPP-2021-0641.

The National Agricultural Aviation Association (NAAA) appreciates the opportunity to comment on EPA's memorandum supporting the proposed decision to approve the registration for isocycloseram.

U.S. Aerial Application Industry Background: NAAA represents the interests of the 1,560 aerial application industry owner/operators and 2,028 non-operator agricultural pilots throughout the United States licensed as commercial applicators that use aircraft to enhance the production of food, fiber and bio-energy; protect forestry; protect waterways and ranchland from invasive species; and provide services to agencies and homeowner groups for the control of mosquitoes and other health-threatening pests.

Within agriculture and other pest control situations, manned aerial application is an important method for applying pesticides, for it permits large areas to be covered rapidly—by far the fastest application method of crop inputs—when it matters most. It takes advantage, more than any other form of application, of the often too-brief periods of acceptable weather for spraying and allows timely treatment of pests while they are in critical developmental stages, often over terrain that is too wet or otherwise inaccessible for terrestrial applications. It also treats above the crop canopy, thereby not disrupting the crop and damaging it. Aerial application has greater productivity, accuracy, speed, and is unobtrusive to the crop compared to ground application[1]. Although the average aerial application company is comprised of but six employees and two aircraft, as an industry these small businesses treat nearly 127 million acres of U.S. cropland each season, which is about 28% of all cropland used for crop production in the U.S. In addition to the cropland acres, aerial applicators annually apply to 5.1 million acres of forest land, 7.9 million acres of pasture and rangeland, and 4.8 million acres for mosquito control and other public health concerns.

While there are alternatives to making aerial applications of pesticides, aerial application has several advantages. In addition to the speed and timeliness advantage aerial application has over

[1] Kováčik, L., and A. Novák, 2020. "Comparison of Aerial Application vs. Ground Application." *Transportation Research Procedia* 44 (2020) 264–270.

other forms of application, there is also a yield difference. Driving a ground sprayer through a standing crop results in a significant yield loss. Research from Purdue University[2] found that yield loss from ground sprayer wheel tracks varied from 1.3% to 4.9% depending on boom width. While this study was conducted in soybeans, similar results could be expected in other crops as well. Data from a Texas A&M University economics study[3] and the 2019 NAAA industry survey[4] were used to calculate that the aerial application industry is directly responsible for the production of 1.69 billion bushels of corn, 199 million bushels of wheat, 548 million pounds of cotton, 295 million bushels of soybeans, and 3.33 billion pounds of rice annually that would be lost every year without the aerial application of pesticides. The value in additional crop yield that the aerial application industry brings to farmers, input suppliers, processors, and agricultural transportation and storage industries for corn, wheat, cotton, soybean, and rice production in the U.S. is estimated to be about $37 billion[5].

Research summarized by the University of Minnesota[6] describes how soil compaction from ground rigs can negatively affect crop yields due to nitrogen loss, reduced potassium availability, inhibition of root respiration due to reduced soil aeration, decreased water infiltration and storage, and decreased root growth. Aerial application offers the only means of applying a crop protection product when the ground is wet and when time is crucial during a pest outbreak. A study on the application efficacy of fungicides on corn applied by ground, aerial, and chemigation applications[7] further demonstrates that aerial application exceeds ground and chemigation application methods in terms of yield response. The aerial application of crop protection products results in greater harvest yields of crops. This in turn results in less land being used for agricultural production, preserving more wetlands for natural water filtration, forest ecosystems for carbon sequestration and habitat for threatened and endangered species.

The Texas A&M[4] study revealed that the total area of cropland needed to replace the yield lost if aerial application was not available for corn, wheat, soybean, cotton, and rice production is 27.4 million acres, an area roughly the size of Tennessee. Aerial applicators seed 3.8 million acres of cover crops annually[5]. This means that aerial applicators are responsible for helping to sequester 1.9 million metric tons of CO2 equivalent annually, which according to the EPA would be the equivalent of removing approximately 412,000 cars with carbon-combustion engines from the roads each year.

The aerial application industry is also actively involved in education and research efforts to improve the accuracy and safety of aerial applications. The National Agricultural Aviation

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[2] Hanna, S., S. Conley, J. Santini, and G. Shaner. 2007. "Managing Fungicide Applications in Soybean." Purdue University Extension Soybean Production Systems SPS-103-W. https://www.extension.purdue.edu/extmedia/sps/sps-103-w.pdf

[3] Dharmasena, S. 2020. "How Much is the Aerial Application Industry Worth in the United States?" Research presented at the 2020 Ag Aviation Expo, Savannah, GA. https://www.agaviation.org/2020aatresearchpapers

[4] National Agricultural Aviation Association. May 2019. "2019 NAAA Aerial Application Industry Survey: Operators." https://www.agaviation.org//Files/Comments/NAAA%202019%20Operator%20Survey.pdf

[5] Dharmasena, S. 2021. "Value of the Agricultural Aerial Application Industry in the United States" Research presented at the 2021 Ag Aviation Expo, Savannah, GA. https://www.agaviation.org/2021aatresearchpapers

[6] University of Minnesota. "Soil Compaction." Accessed April 29, 2021. https://extension.umn.edu/soil-management-and-health/soil-compaction

[7] Thomas, D. 2009. Unpublished research results submitted to EPA. https://www.agaviation.org//Files/Comments/Fungicide%20efficacy%20results.pdf

Research and Education Foundation (NAAREF) is a non-profit organization dedicated to promoting research, technology transfer and advanced education among aerial applicators, allied industries, government agencies and academic institutions. NAAREF's Professional Aerial Applicators' Support System (PAASS) program is a four-hour course offered annually at all state and regional agricultural aviation association conventions. The curriculum is brand new every year and a minimum of one hour of PAASS is focused on environmental professionalism. This ensures aerial applicators are kept up to date on the latest information related to making accurate applications and drift mitigation. Nozzle selection, buffer zones, inversions, precision application technology, dissection of real-life drift incidents, and proper spray boom setup are some of the environmental professionalism topics that have been covered in PAASS.

Five years after PAASS became part of the aerial application annual curriculum in 1999, there was a 26% drop in drift incidents according to Association of American Pest Control Officials drift surveys. In addition, ag aircraft accidents have also significantly declined. From 1999 to 2010, the accident rate per 100,000 hours flown dropped by 21.6% compared to pre-PAASS accident rates. From 2011 to 2019, the accident rate dropped even more—30.8%—compared to pre-PAASS accident rates. Each year we continue to see a drop in our accident rate since pre-PAASS days, but now it declines more incrementally. While aviation safety is the domain of the FAA and not the EPA, the reduction in accidents proves PAASS has had, and continues to have, a significant positive impact on the aerial application industry.

Another NAAREF program is Operation S.A.F.E. (Self-regulating Application & Flight Efficiency). The primary component of Operation S.A.F.E. is a fly-in clinic. At a S.A.F.E. fly-in, aerial applicators can have their aircraft calibrated and application patterns (both liquid and dry) measured and evaluated for accuracy and uniformity. Spray droplet size is also measured at a fly-in to ensure the agricultural aircraft is creating the droplet size required by the labels for products to be applied by the aircraft. Many of the concepts used mitigate the risk of drift from agricultural aircraft have originated from ideas first tested at Operation S.A.F.E. fly-ins.

Just last year, NAAA created a professional certification program for the aerial application industry named C-PAASS for Certified Professional Aerial Application Safety Steward. To be certified under C-PAASS aerial applicators must take the PAASS program annually and Operation S.A.F.E. biennially, in addition to belonging as a member to their state/regional agricultural aviation association and the NAAA. C-PAASS professionals are also required to take and be tested on additional aviation safety and environmental stewardship curriculum offered on-line through a learning management system software NAAA installed. The purpose of C-PAASS is to enhance professionalism in the aerial application industry as our statistics show that those that participate in our educational programs are safer from both an aviation and environmental perspective.

Comments

NAAA strongly opposes the decision to limit aerial applications of isocycloseram on corn and soybean to the states listed in the proposed decision to approve the registration for isocycloseram. NAAA agrees with EPA that growers will benefit from aerial applications of this new active ingredient on these crops, but EPA is proposing to ban aerial application of it in the

states with the highest production of these crops. According to data from the USDA[8], Iowa is the top state for corn production in the U.S., followed by Illinois. Of the top 10 corn producing states in the U.S., only Nebraska and Kansas will be allowed to have aerial applications of isocycloseram to corn. If the EPA has concluded that aerial application of an insecticide with a novel mode of action is important to corn growers, then why deny its usage in the states that will need it the most?

The same argument can be made for soybean production. Illinois is the top soybean producing state, followed closely by Iowa. Minnesota, Indiana, and Nebraska make up the rest of the top five soybean producing states. According to the proposed decision to approve the registration for isocycloseram, no grower from these five states can utilize aerial application to protect their soybean fields. The only state in the top 10 soybean producing states in the U.S. where aerial applications of isocycloseram on soybean will be allowed is Missouri.

The following table provides estimates, based on NAAA's 2019 industry survey data, of the acres of corn and soybean treated by aerial application for 10 of the states not included in the list of states where isocycloseram can be applied by air to corn or soybean (some states in the table allow for one of the crops but not both). Also given is the percentage of the USDA 2024 acres harvested for both crops that was estimated to have been treated by aerial application. Clearly, aerial application is critical for the production of both corn and soybean in these 10 states.

State	Corn acres treated by aerial	% corn aerial	Soybean acres treated by aerial	% soy aerial
Iowa	5,893,702	48%	2,512,194	25%
Illinois	5,035,236	47%	2,678,379	25%
Nebraska	4,296,582	44%	1,430,154	27%
Minnesota	3,540,199	46%	2,055,883	28%
Indiana	2,455,211	49%	1,510,230	26%
South Dakota	2,396,739	46%	1,421,952	26%
Kansas	2,377,701	41%	1,292,820	29%
Missouri	1,529,311	47%	1,481,779	25%
Ohio	1,493,326	47%	1,285,303	26%
North Dakota	1,488,938	41%	1,789,070	27%

The reason provided for banning aerial application of isocycloseram on corn and soybean except for the listed states is to protect non-target terrestrial and aquatic invertebrates, as well as pollinators. Yet, no specific details are provided on why certain states were selected to allow aerial applications of isocycloseram for corn and soybean and others were prohibited. Are there endangered species or critical habitat in the states not eligible for aerial applications of isocycloseram on corn and soybean that are not found in the states that can receive these types of applications? Are such species or habitat at higher risk in the banned states? Why does EPA feel the downwind ecological buffers will work to protect listed species and other non-target organisms in the states set to have aerial applications of isocycloseram on corn and soybean but will fail in the states that are prohibited from using aerial application on the two crops?

Aerial application is critical for ensuring growers can make timely and effective applications of pesticides. Only aerial application is capable of treating a large number of acres in a shorter

[8] https://downloads.usda.library.cornell.edu/usda-esmis/files/tm70mv177/bz60fp33t/d791v920m/crop1124.pdf

period of time, particularly if the ground is wet. During rapidly developing pest outbreaks the ability to treat a high number of acres in a short period of time is critical and requires aerial application. If growers are forced to use only ground applications, the applications face an increased likelihood of being less effective. This will result in yield loss and potentially further increases in resistance. Isocycloseram has a novel mode of action that is active against numerous invertebrate pests, and it will provide a new mode of action for resistance management. Because numerous crops, including corn and soybean, rely on aerial application for timely applications of insecticides, banning aerial application of isocycloseram will severely hamper its ability to serve as an option for controlling pests resistant to currently available insecticides. As an example, EPA has recently banned the use of chlorpyrifos on corn. Isocycloseram can provide a much-needed relief for corn growers facing pests resistant to Bt products and pyrethroids. But to be truly effective, corn growers will need to be able to rely on aerial applications when timely treatments are essential for successful control of pests.

Regarding protection for bees and other pollinators, for those located in non-managed areas, will the downwind ecological buffers be sufficient in only certain states? For bees and other pollinators present in the target field and adjacent managed areas, EPA has placed restrictions on when applications can be made to avoid times when pollinators are most active. For the rusty patched bumble bee, PULAs will be used to protect the species. Are these restrictions expected to only be protective in certain states?

In addition, the temporal restrictions on applications of isocycloseram to protect bees and other pollinators further increases the need for aerial applications. To compare the productivity between aerial application and ground application in a row crop agricultural setting, an aerial applicator and ground applicator from Mississippi were asked to provide details about the productivity of their application equipment. The aircraft was an Air Tractor AT-502B with a 60-foot swath width and the ground rig was a John Deere R4030 with a 90-foot boom. In both cases a 12-hour day of spraying was assumed, which is appropriate during the height of the spraying season. In an average 12-hour day, the aircraft treats 1,800 acres while the ground rig treats 450 acres, meaning aerial application is roughly four times as productive as ground application in this region. Eliminating all isocycloseram applications between 10 AM and 3 PM will force growers to make all of their applications during the limited hours when they will be allowed. Banning aerial application makes it even worse for corn and soybean growers in states where aerial application will not be allowed by reducing their application productivity by 75%.

NAAA also objects to the 150-foot buffer zone for aerial applications of isocycloseram adjacent to aquatic areas being not based on wind direction, and that the buffer zone cannot be reduced using mitigations on EPA's Mitigation Menu Website. Science has consistently indicated that drift only moves downwind[9,10,11] and this has been acknowledged by EPA, hence all ecological

[9] Kirk, I.W., M.E. Teske, H.W. Thistle. 2002. "What About Upwind Buffer Zones for Aerial Applications?" *Journal of Agricultural Safety and Health* 8(3): 333-336.
[10] Teske, M.E., S.L. Bird, D.M. Esterly, S.L. Ray, S.G. Perry. 2003. "A User's Guide for AgDRIFT ® 2.0.07: A Tiered Approach for the Assessment of Spray Drift of Pesticides." https://usermanual.wiki/Pdf/AgDriftusermanualpubFes2003.1946090729.pdf
[11] Butts, T.R., B.K. Fritz, K.B. Kouame, J.K. Norsworthy, L.T. Barber, W.J. Ross, G.M. Lorenz, B.C. Thrash, N.R. Bateman, J.J. Adamczyk. 2022. "Herbicide spray drift from ground and aerial applications: Implications for

and ESA buffer zones are based on wind direction. Why would a buffer zone to protect an aquatic area need to be any different? The same applies to the mitigation options – using a larger spray droplet size and reducing boom length mitigate drift no matter what is downwind. NAAA fully supports the aerial drift mitigations as detailed in the final insecticide strategy but fails to understand why EPA believes they can be used to protect ecologically sensitive areas and endangered species from drift associated with the aerial applications of isocycloseram, but not aquatic areas.

The ecological risk assessment for isocycloseram indicates that the Tier 1 AgDRIFT model was used to estimate drift from aerial applications for this registration decision. EPA's *Ecological Mitigation Support Document to Support Endangered Species Strategies* provides detailed information on how and why the Tier 3 AgDRIFT model should now be used to estimate spray drift from aerial applications. While EPA did select the larger droplet size in Tier 1 for the assessment, there are many other faulty assumptions with the Tier 1 model[12]. The overestimated drift from the use of the Tier 1 model may be a major reason why EPA found it necessary to ban aerial applications of isocycloseram on most crops, prohibit aerial application on corn and soybean in the states with the highest production of these crops, and impose a buffer to protect aquatic areas that is not based on wind direction. EPA policy, as laid out in the ecological mitigation support document and verified in public comments made by EPA administrators, is to now use the Tier 3 AgDRIFT model instead of the Tier 1 model. Therefore, NAAA encourages EPA to follow their own guidance and re-assess the risk of drift from aerial applications of isocycloseram using the Tier 3 AgDRIFT model.

NAAA also opposes prohibiting aerial application of isocycloseram on the many other crops that will be on its label. As with the banning of aerial applications of isocycloseram in certain states for corn and soybean, NAAA does not understand why the downwind ecological buffers and temporal restrictions are sufficient for protecting non-target species and pollinators for some crops but not others.

EPA's insecticide strategy was designed to protect endangered species and critical habitat from pesticide applications. NAAA firmly supports the insecticide strategy and believes it should be fully used in the registration of isocycloseram. By using the updated Tier 3 AgDRIFT model to estimate the risk of drift from aerial applications, the danger to non-target species will be assessed more accurately. Furthermore, the downwind ecological buffers for all non-managed areas will protect all non-target species, both terrestrial and aquatic.

NAAA supports the remaining proposed label drift mitigation requirements for making aerial applications of isocycloseram including the prohibition on applying during an inversion, boom length and upwind swath displacement restrictions, maximum wind speed, measuring wind speed and direction, use of a medium or coarser droplet spectrum, and the 10 ft maximum release height.

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potential pollinator foraging sources." Scientific Reports (2022) 12:18017. https://doi.org/10.1038/s41598-022-22916-4

[12] NAAA letter to EPA, June 29, 2020. https://www.agaviation.org//Files/Comments/EPA%20letter%20re%20AgDRIFT%20Tier%203%20aerial%20risk%20assessment%20use%2020200629.pdf

Conclusion

NAAA opposes the prohibition of aerial applications of isocycloseram to corn and soybean in most states. NAAA also opposes the prohibition of aerial application to all crops except corn, soybean, cotton, and potatoes. Finally, NAAA recommends that the buffer zones to protect aquatic areas be based on wind direction.

Thank you for this opportunity to comment.

Sincerely,

Andrew D. Moore
Chief Executive Officer