August 11, 2026

Environmental Protection Agency
Docket Center
Isoxaflutole: New Use on Herbicide Resistant Cotton
Mail Code 28221T
1200 Pennsylvania Ave. NW
Washington, DC 20460-0001

Submitted via www.reguations.gov

RE: EPA's proposed registration decision to approve the registration for the new use on active ingredient, isoxaflutole; Docket ID: EPA-HQ-OPP-2020-0202

The National Agricultural Aviation Association (NAAA) appreciates the opportunity to comment on EPA's proposed registration decision to register isoxaflutole for a new use on isoxaflutole-resistant cotton, and for a geographic expansion of the current registration for use on isoxaflutole-resistant soybean.

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, because it permits large areas to be covered rapidly and is by far the fastest application method of crop inputs, when it matters most. More than any other application method, manned aerial application capitalizes on the often limited windows of suitable spraying weather and allows for 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 only 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.

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

While there are other application methods available to growers, aerial application has several advantages over these other options. In addition to the speed and timeliness advantage aerial application has over 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[5] 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 CO_2 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.

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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/education/aerial-application-technology-research-sessions/

[4] National Agricultural Aviation Association. May 2019. "2019 NAAA Aerial Application Industry Survey: Operators." https://www.agaviation.org/wp-content/uploads/2024/04/NAAA-2019-Operator-Survey.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/education/aerial-application-technology-research-sessions/

[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/wp-content/uploads/2023/06/2009-Fungicide-Efficacy-Results.pdf

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 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 the 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 SAFE (Self-regulating Application & Flight Efficiency). The primary component of Operation SAFE is a fly-in clinic, where aerial applicators 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 to mitigate the risk of drift from agricultural aircraft have originated from ideas first tested at Operation SAFE fly-ins.

NAAA has created a professional certification program for the aerial application industry named Certified Aerial Applicator (CAA). To be certified under CAA, aerial applicators must take the PAASS program annually and Operation SAFE biennially, in addition to belonging as a member to their state/regional agricultural aviation association and the NAAA. CAA 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 managed by NAAA. The purpose of CAA is to enhance professionalism in the aerial application industry as our statistics show that those who participate in our educational programs are safer from both an aviation and environmental perspective.

Comments

NAAA opposes the prohibition of aerial application of isoxaflutole on both cotton and soybean. NAAA acknowledges that the aerial application of herbicides for preplant and preemergence uses are not as common as other types of aerial applications. Growers will normally make these types of herbicide applications themselves or have it applied by a retailer, in both cases using a ground rig. However, while growers may go years without utilizing aerial applications for these types of applications, if an excessively wet spring occurs when soils remains too wet for a ground rig, growers know they can use aerial application to get the work done. Denying them the ability to use aerial application in these situations could lead to a failure to effectively apply isoxaflutole, which in turn could lead to the survival and growth of resistant waterhemp, Palmer amaranth, and other pigweed species. Post-emergence and burndown herbicide applications are routinely made by aerial applicators, especially in the southern part of the U.S.

As an example, the ideal size for control of palmer amaranth with a post-emergence herbicide is 2-4 inches in height at the time of application, with plants taller than 6 inches being only partially controlled or not controlled at all[8]. Palmer amaranth grows 2-3 inches per day[9]. Assuming a grower in the southern United States notices an infestation of palmer amaranth the day after emergence at 2 inches in height, a delay of spraying with a ground rig of seven days caused by a substantial spring rain event[10] could allow the palmer amaranth to grow to a minimum height of 16 inches. This is well beyond the point where control is possible.

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 period, which is particularly critical when the ground is wet or high wind speeds are limiting the daily hours available for making an application. 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.

NAAA proposes aerial applications of isoxaflutole be allowed for both cotton and soybean with the following restrictions:

- Apply when wind speed is 15 mph or less.
- Do not apply during inversions.
- Maximum boom length allowed dependent on wind speed.
    - 0 to 10 mph
        - 75% of wingspan for fixed-wing aircraft
        - 90% of rotor diameter for helicopters
    - 11 to 15 mph
        - 65% of wingspan for fixed-wing aircraft
        - 75% of rotor diameter for helicopters
- Release height of 10 ft unless a greater height is required for safety.
- Use a coarse or coarser droplet size.
- Wind speed and direction must be measured on location at release height.
- Minimum upwind swath displacement dependent on wind speed.
    - 0 to 10 mph: ½ swath width

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[8] Legleiter, T. 2020. "Palmer Amaranth and Waterhemp Control in Corn and Soybean." https://publications.mgcafe.uky.edu/sites/publications.ca.uky.edu/files/AGR260.pdf . Assessed August 11, 2026.
[9] USDA NRCS. 2017. Agronomy Technical Note MT-92 "Palmer Amaranth". https://www.nrcs.usda.gov/plantmaterials/mtpmctn13127.pdf Accessed August 11, 2026
[10] Holloway, G. Operator and Chief Pilot of G3 Flying, LLC; 2024 NAAA Vice President. Personal Conversation March 14, 2024.

    - 11 to 15 mph: ¾ swath width
- Downwind buffer distance of 50 feet between target site and PULAs or unmanaged areas.
    - Applicator may use buffer reduction options on EPA's Mitigation Menu Website.
    - Managed areas may be included as part of buffer distance.

<u>Conclusion</u>

NAAA opposes the prohibition on the aerial application of isoxaflutole. The risks to non-target species can be mitigated by following NAAA's suggested aerial application restrictions as detailed in these comments.

Thank you for this opportunity to comment.

Sincerely,

Scott Bretthauer

Scott Bretthauer, PhD
Director of Policy, Education, and Safety