

Aerial Applicators Help Feed, Clothe and Fuel the World



Aerial application is a vital component of modern, high-yield agriculture. By enabling farmers to protect crops quickly and efficiently, aerial application helps produce more food, fiber and bioenergy on existing farmland. In many situations, it is the fastest, most efficient, economical and sometimes the only way to protect crops from yield-robbing insects, weeds and plant diseases. As the global population grows and people live longer and want healthier options, farmers and aerial applicators will face increasing pressure to produce more with fewer resources.



To meet the food demand of the growing global population, the Food and Agriculture Organization of the United Nations estimates that global food production must increase by about 70 percent by 2050 to feed 9.7 billion people.

12%

Percentage of the world's food supply the U.S. helps produce

5%

Percentage of global farmland used by U.S. farmers



70%

Additional food needed by 2050

Because of the growing demand for food, fiber and bioenergy, aerial application—and its ability to make fast, precise and timely applications—will become even more important in the future.

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Did You Know?

- Aerial applicators treat more than 127 million acres of cropland each year in the U.S., in addition to millions of acres of pasture, rangeland and forestland.
- About 28 percent of crop protection products used on U.S. commercial farms are applied aerially, and nearly all aerial forest protection treatments are made using aircraft.
- Aerial application is used on nearly all major crops. The five most common crops treated are corn, wheat/barley, soybeans, alfalfa, and pasture/rangeland.
- If the industry didn't exist, 27,400,000 acres of cropland would be needed to replace the yield lost; an area roughly the size of Tennessee
- Aerial application benefits both conventional and organic agriculture, as all crops require nutrients and protection from pests and diseases. Both use crop protection products, but the approved options differ.
- Aerial application can benefit the environment by helping farmers produce more food, fiber and bioenergy on existing farmland, reducing pressure to convert forests, wetlands and wildlife habitat into cropland.
- Ag pilots seed crops, including 3.8 million cover crops, annually. This has a positive climate impact, allowing for more than 2,000,000 tons of CO₂ to be sequestered, the equivalent to removing around 412,000 cars from the road.
- During disease outbreaks or severe insect infestations that threaten crops, farmers rely on aerial application because it treats large areas quickly and efficiently, helping prevent widespread crop loss.
- Aerial application also plays a critical role in public health mosquito control, helping reduce populations that can transmit diseases such as West Nile virus, Zika virus and encephalitis.
- Agricultural aviators operate modern turbine-powered aircraft equipped with precision technology, including GPS guidance systems and advanced spray equipment. New agricultural aircraft can cost \$1.5 million or more, depending on size and equipment.



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What is Aerial Application?

Aerial application uses airplanes and helicopters to seed, fertilize and apply crop protection products to control weeds, insects and plant diseases. It is used on both conventional and organic cropland. Aerial application is also used to treat forestland, rangeland and pastureland.

In addition to boosting crop yields, aerial applicators use agricultural aircraft to seed soil-enhancing cover crops, help fight and prevent the spread of wildfires, assist with oil spill response, and protect public health by controlling mosquitoes that transmit diseases. The industry has been in existence for more than 100 years. Originally known as “crop dusters,” today’s pilots are more accurately referred to as “aerial applicators” or “agricultural aviators.”

Training & Professionalism

Ag pilots are highly trained professionals committed to performing their work in a safe, efficient and responsible manner.

- On average, agricultural pilots have more than 25 years of agricultural flying experience and nearly 10,000 hours of agricultural flight time—equivalent to being in the air for more than 14 months nonstop.
- To perform work, ag pilots must hold a commercial pilot certificate and pass additional knowledge and flight proficiency requirements specific to agricultural aircraft operations, as well as maintain appropriate agricultural aviation insurance coverage.
- Ag pilots must obtain a pesticide applicator license in each state where they operate, demonstrating their knowledge of the safe handling, application and environmental stewardship of crop protection products.
- Agricultural aviators use advanced precision technologies, including GPS guidance systems, weather monitoring systems, digital mapping and drift-reduction equipment, to ensure accurate, on-target applications and minimize off-target movement.
- Ag pilots regularly pattern-test their aircraft at Operation S.A.F.E. (Self-Regulating Application and Flight Efficiency) clinics, where application equipment is evaluated to ensure products are delivered evenly and accurately for optimal crop coverage and plant health.



FLYING FOR YOUR FOOD

THE MANY BENEFITS OF AERIAL APPLICATION



AGAVIATION.ORG



Aerial application is a vital component of high-yield agriculture, benefiting the environment by producing more crops on fewer acres.

SIX QUESTIONS

1 Is It Better for the Environment and Public Health to Avoid Using Pesticides?

Misconceptions about pesticides are widespread. The truth is that using pesticides to protect crops increases production, allowing consumers to enjoy an abundance of fresh, affordable foods year-round. Without crop protection products to control insects, weeds, and plant diseases, crop yields per acre would drop dramatically—by more than 50 percent for some crops. We live in an age when most Americans have convenient access to a wide variety of healthy foods. Farmers, farm service providers such as agricultural pilots, and crop protection tools all play an important role in making this possible.

Did You Know?

The Environmental Protection Agency (EPA) regulates pesticide registration in the United States and establishes requirements for their safe use. Registering a new crop protection product can take a decade or more and typically requires over 100 scientific studies evaluating human health, environmental safety, and effectiveness.

2 Are Organic Foods Healthier or Safer to Eat Than Conventionally Grown Food?

No scientific evidence has shown that organic foods are more nutritious than conventionally grown foods. Organic refers to a method of production, not a statement about food safety. All foods sold in the U.S. must meet the same strict safety standards regardless of how they are grown. Conventional farming uses crop protection products approved by the EPA. Contrary to popular belief, organic farmers also use pesticides, though they are limited to products approved for organic production, to protect their crops. Organic growers may also rely on aerial application. A survey by the NAAA found that more than one in four agricultural aviation businesses had applied products to an organic field.

Did you know?

The EPA develops strict limits on pesticide residues that are 100 to 1,000 times lower than levels at which health impacts might occur. These tolerance levels are considered safe based on average daily food intake by adults and children.

Choosing conventional or organic produce doesn't have to be an either-or decision. Both options are safe, and both farming systems rely on crop protection tools to help ensure healthy crops and a reliable food supply. The American Cancer Society acknowledges the role pesticides play in modern agriculture: ***"Many kinds of pesticides are widely used in agriculture in the production of our food supply. People who eat more fruits and vegetables—which may contain trace amounts of pesticides—generally have lower cancer risks than people who eat fewer fruits and vegetables. Pesticides play a valuable role in sustaining our food supply. When properly controlled, the minimal risks pesticides pose are greatly outweighed by the health benefits of a diverse diet rich in foods from plant sources."***

The best line of defense isn't avoiding certain types of produce—it's simply rinsing fruits and vegetables thoroughly before eating them, just as generations have done.

3 How Safe Is Agricultural Aviation?

Safety is our top priority. Agricultural pilots are highly trained professionals who use advanced GPS guidance and precision technologies to help ensure their safety and the safety of the environment and the public. The industry's accident rate is extremely low, but ag pilots must contend with obstacles such as towers, power lines, wind turbines, or drones. Most aerial applicators have thousands of hours of flight time, yet their commitment to continuous improvement never stops. Each year, aerial applicators precisely test and calibrate their aircraft's spray equipment for accurate applications and attend state and national conventions to receive ongoing training on important industry topics, including aviation safety, application stewardship and security issues.



4 Why Is Aerial Application Preferable to Other Ground Methods of Treating Crops?

Four reasons: First, an airplane or helicopter can accomplish far more work in a day than any other method of application. Second, aerial application is often the only—or most economical—way to treat crops in a timely manner. For example, when wet soil, rolling terrain, or dense plant foliage prevent ground equipment from reaching the area, aerial application may be the only practical option. Third, aerial application does not compact the soil or contribute to topsoil erosion, since the aircraft never comes into contact with the crop or the ground. Finally, numerous studies show that aerial application can increase crop yields and support environmentally responsible farming practices.

Quick Fact!

Applying products by air supports low-till or no-till farming practices and allows access to the crop when the field is too wet for land-based equipment to enter safely.

5 What Do Aerial Applicators Do to Secure the Aircraft, Equipment, and Chemicals They Use?

Aerial applicators take their responsibility to protect the safety of neighbors, employees, and the public very seriously. Agricultural aviators work closely with federal and local law enforcement to ensure that aircraft, equipment, and chemicals on their premises remain secure. Any suspicious activity is reported to a TSA hotline established specifically for the General Aviation community, as well as to local authorities. Because modern ag aircraft are expensive and highly specialized, multiple safeguards limit unauthorized access. Together, these safeguards help protect the community while demonstrating the industry's commitment to safety and responsible operations.



6 Is Aerial Application Considered Precision Agriculture?

Yes. Precision agriculture improves the accuracy, efficiency, and effectiveness of farming operations, and aerial application is a key component of many precision agriculture systems. Technologies used by aerial applicators include GPS guidance systems, advanced spray nozzles, and boom-lowering systems that place nozzles in less-disturbed air to improve application accuracy. According to an NAAA survey, 99.9% of aerial applicators use GPS technology to ensure targeted application while helping reduce overspray, drift, and unintended exposure to people and the environment. Ag pilots also employ additional precision technologies to enhance application performance and stewardship.

Quick Fact!

GPS guidance allows accuracy within a few inches so pilots can apply crop protection products with remarkable precision across thousands of acres.