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THE *Voice*

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NATA SCHOLARSHIP AWARDEE: ALEXANDER THOMAS

Agricultural Aviation has played a critical role in both food production and the economy for nearly a century now in the United States. First attempted in 1921, and commercialized in 1923, applying a synthetic chemical to a crop for the purpose of increasing yields has become a staple in agriculture nationwide. Ag aviation is important as it allows practical and efficient application of various fungicides and pesticides that have routinely been shown to increase yield. Ag aviation has also demonstrated both yield and economic benefits over other application methods. These advantages and have stood the test of time for a century and continue to testify as to why ag aviation is so important to farmers for reaching their yield potentials and maintaining a strong bottom line.

In that fateful flight in 1921, catalpa trees were dusted with lead arsenate to kill sphinx moth larvae. In the next years, cotton fields in Louisiana were sprayed to fight bollweevil populations. With success in these first trials, the ag aviation industry took flight. Today, fertilizers, pesticides, and fungicides are commonly applied to help crops produce high yields. Research from various institutions has quantified that yield increase. Kansas State University research calculated a 18.6 bushel per acre increase with the application of fungicide versus untreated corn. Schertz Aerial also ran research that demonstrated a 10 bushel increase for soybean yields. These numbers can truly show the difference that ag aviation can create, both in the field and for the bottom line.

Aviation technology is not the only application method that has been utilized by farmers. Ground spraying is also a prevalent practice; however, it is not without its drawbacks. These heavy machines move slow and can cause significant ground compaction during use. This compaction causes problems for a crop, especially during its peak growth phase. Compaction can inhibit root growth forcing the plant to expend more energy for shorter roots. It can also lower the amount of nutrients that a plant can access in the soil. Both accessible potassium and nitrogen levels have been shown to dip when this compaction occurs. Not only does ground application indirectly harm the crop, it also directly harms a consistent percentage of crops from wheel damage. This disturbance routinely affects anywhere from 5% to 15% of possible yield. While some steps can be taken to reduce this number, some damage will always occur anytime a ground sprayer is used. Applying these same chemicals with an airplane, however, will completely avoid these problems. In a study done by the Nebraska Department of Aeronautics, extrapolating the data from the yield loss, they predict that this damage could result in a loss of about 6.3 million bushels of corn per year. That same amount is worth about 34 million dollars in the Nebraska economy. While ground sprayers are still viable for chemical application, it is hard to overlook some of the advantages that aerial application provides.

Agricultural aviation has been a critical tool for farmers to increase yield, avoid shortcomings of other application methods, and increase profits. Application of fungicides and pesticides has consistently helped achieve higher yields with the same number of acres. Utilization of aerial spraying prevents both ground compaction and crop damage by ground sprayers. These factors both play a significant role in promoting efficient farming practices and bolstering farmers' bottom line. Agricultural aviation is important in aiding farmers to man the cockpit of their operations.

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NATA SCHOLARSHIP AWARDEE: PHOEBE KOLB

The Importance of Agricultural Aviation

The field of agricultural aviation is often a subject of little knowledge to those outside the agricultural community even though it plays a crucial role in feeding the globe. Growing up in a family of spray pilots, I learned early on the importance of agricultural aviation and the hidden role it plays in supporting our economy.

Though agricultural aviation is important for a multitude of reasons, the main benefit is that it generates healthy crops in the most efficient manner. The healthier a crop, the greater the yield. Aerial application has many benefits over ground application, most important being the speed at which fertilizers and pesticides can be administered. Crops are susceptible to many different diseases and infestations and timing is crucial to saving a crop from these harmful factors. According to the Food and Agricultural Organization of the United Nations (FAO), “FAO estimates that between 20 and 40 percent of global crop yields are reduced each year due to the damage wrought by plant pests and diseases” (FAO 2015). By using an aerial application farmers can protect against and prevent significant damage and yield reduction.

Another benefit of aerial application is that it doesn't harm the soil or matured crops. Whenever farmers drive machinery through their field rather than spraying from above, they compact the soil which can lead to poor root growth and a decline in the stability of the soil structure. Aerial application also ensures that non row crops, such as alfalfa, don't get trampled when driven through. If an application needs to be made later in the year when corn is close to fully mature, driving through the field would sometimes cause more harm than good. However, in mid July to late August spray planes can quickly and effectively spray fungicides on almost fully grown corn to combat pathogens like grey leaf spot and southern rust.

Not only is agricultural aviation important in treating crops during the growing season but also during the off season. Spray planes can seed directly into standing crops, unlike ground machinery, allowing cover crops to begin developing even before harvest. All these factors contribute to healthier crops and higher yields, producing more revenue and feeding the world.

Spray pilots play a behind-the-scenes role in feeding the globe and it is high time that their hard work is recognized. An aspect of agricultural aviation that is often forgotten is the spray pilots' courage. Spraying is a dangerous and risky job. The United States Department of Labor ranks “Aircraft Pilots and Flight Engineers” as statistically the third highest for “fatal work injury rates” in the United States. Aerial applicators risk their lives each day flying at speeds of around 150 mph, only 10 to 15 feet above the crop in order to reduce drift, putting them at high risk of hitting any protruding structures. As a result, they cannot rely solely on their instruments and must ‘fly by the seat of their pants.’ This willingness to undertake dangerous work makes aerial applicators an important part of the agricultural world.

Though the economical importance of agricultural aviation lies in speed, timing, and disease prevention, agricultural aviation is also important on a familial level. Living in rural Nebraska, the smell of jet fuel and the sound of spray planes early in the summer mornings is engraved in my mind. I remember as a child trying to run as fast as my grandparents' spray planes as they took off the runway that lay adjacent to their home. I learned about work ethic and dedication watching the pilots wake up in the early hours of the morning to fly and not return until the sun had gone down. I am proud of my family and as the 100th anniversary of the first crop duster flight on August 3, 1921 comes nearer, it is essential that the importance of agricultural aviation is remembered. Although agricultural aviation is not a widely known field outside of the agricultural community, it plays an important role in everyone's lives.



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STATE OF THE INDUSTRY

By Dan Petersen

The airline industry has seen its ups and downs ever since its inception. I started my airline career almost 32 years ago and have been furloughed twice. It always seemed to go in cycles every 10 years or so with the highs and lows of the economy. There are two times that caused devastation of the industry that no one saw coming: 1) the terrorist attacks on 9/11, and 2) the COVID-19 pandemic.

Before the pandemic, a pilot shortage had been forecast and the airlines were hiring at a blistering pace. The airline that I fly for was hiring over 1,000 pilots a year and pilots were upgrading to captain or to wide body aircraft very quickly, with no end in sight. When the pandemic hit, travel declined as states, cities, and countries shut down. The airline industry reacted by furloughing thousands of pilots and offering early retirement and leave packages that were difficult to turn down. The airlines were hemorrhaging millions of dollars a day while they parked large portions of their fleet.

All of this had to be crushing to those who aspired to someday start an airline career and ride the big hiring wave. The good news is that demand for travel has come back stronger than the airlines predicted. Airlines are recalling all their furloughed pilots and are even hiring again. Our airline recalled all furloughed pilots and are planning on hiring an additional 300 pilots by year end. We still have quite a few pilots who will reach the mandatory retirement age of 65 in the next several years, and that will require the airline to keep hiring for some time.

For those of you hoping for an airline career, things are looking up. I still think it is the best job out there and have no regrets choosing this profession. I still have fun flying airplanes, seeing all the beautiful sights from the air, and visiting new destinations – with the bonus of getting paid to do it. If you ever had a teacher tell you that “no one will pay you to stare out a window,” the joke is on them

TRUE NORTH VS MAGNETIC NORTH

By David Morris

As we know, True North (Geographic North) is the direction toward the fixed point we call the North Pole. Magnetic North is the direction towards the north magnetic pole, which is a moving point where the Earth's magnetic field goes vertically down into the planet.

The magnetic North Pole is located between 200 to 600 statute miles south of the geographic North Pole, on the island of Prince of Wales, depending on the current wandering of the magnetic North Pole. The magnetic North Pole was discovered in 1948 by Paul Serson. He used a special instrument that measured the direction and dip of the magnetic field.

An area on the Earth's surface where these two poles align is what is known as Greenwich, in the United Kingdom. The poles' alignment means following direction from the magnetic compass to the magnetic North Pole would also navigate you to the true North Pole. Greenwich, England is known as the home of the prime meridian.

Recently, for the first time in approximately 360 years, it is said that at this historic area the magnetic compasses pointed directly at the true North Pole. This occurrence is due to the changes of the magnetic North Pole location with time.

The angle between alignment of the two poles is referred to as “declination.” The location change of the magnetic North Pole is slow, and this provides challenges of predicting the declination for a particular area on Earth. At some locations, alignment of the two poles is very unlikely at any time, based on predictions. This is because the rate of change is slow and prediction models are updated at approximately five-year intervals.

A hiker using a magnetic compass must be mindful of declination. If the walker disregards the local value of declination, they may walk in the wrong direction. Perhaps Douglas Corrigan (often referred to as “Wrong Way Corrigan”), an American aviator and one of the builders of Charles Lindbergh's “Spirit of St. Louis”, experienced this declination factor as he navigated from New York to California. After initially taking up a westerly heading from Brooklyn, New York, he mysteriously made a 180-degree turn, and 28 hours later landed in Dublin, Ireland. He did admit to a navigational error causing him to misread his compass.

We need to remember, as a magnetic compass is an essential tool for navigation, it does have some inherent errors, and if we understand the cause of these errors, it becomes a much friendlier device .

NAAA SENDS PRESS RELEASE CAUTIONING UAV OPERATORS TO NOT DISRUPT FOOD SUPPLY CHAIN BY INTERFERING WITH AG AIRCRAFT, PARTICULARLY DURING COVID-19 PANDEMIC

With another growing season getting underway in the midst of the ongoing COVID-19 pandemic, last week NAAA sent a news release to aviation and agricultural media outlets advising UAV operators to be extra mindful of low-flying manned agricultural aircraft operations.

The press release recommends UAV operators:

- Equip drones with tracking technology, such as ADS-B In, so you will know ADS-B Out equipped manned aircraft positions.
- Get certified and well-trained in operating a UAV.
- Contact local agricultural aviation operations before flying by consulting AgAviation.org/findapplicator.
- Equip UAVs with visible strobe lights and high visibility marking.
- Give the right-of-way to a manned aircraft. It's the law.
- Land your UAV immediately when a low-flying aircraft is nearby.
- Carry UAV liability insurance.

NAAA's UAV message has been featured in DroneDJ, Ag Air Update and on the The Ag Information Network's Agribusiness Report (listen from the 30-second to 1-minute mark). The news release also netted a return invitation for NAAA CEO Andrew Moore to appear on RFD-TV's daily news program. He addressed drone and ag aviator safety issues on RFD-TV's "Market Day Report" on April 8.

This is the fifth year NAAA has reached out to the press regarding safe UAV operations as we enter the spring growing season. Past coverage has included Vertical Magazine, Small UAS News, Farm Journal's Ag Pro and RFD-TV radio. RFD-TV is the nation's first 24-hour television network focused on agribusiness reaching more than 50 million homes on DISH Network, DIRECTV, Comcast, and many other rural cable systems. The Ag Information Network of the West has 135 affiliate radio stations covering nine states, including California, Colorado, Idaho, Oregon, Washington, Montana, Wyoming, South Dakota and Nebraska.

"The Department of Homeland Security (DHS) declared crop input services to be an essential service during the pandemic. Aerial applicators are inputting nutrients, seeds and crop protection products to crops that will become consumers' food and fiber supply. We cannot afford even a small disruption in the nation's food supply chain during this critical time," Moore said in the release. "Agricultural aviators perform applications on 28% of cropland nationwide, and their work cannot be delayed because of an unidentified UAS not yielding to them, as is required by law."



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