



# Aviation Investigation Final Report

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|                                |                              |                         |             |
|--------------------------------|------------------------------|-------------------------|-------------|
| <b>Location:</b>               | Parsons, Tennessee           | <b>Accident Number:</b> | ERA14FA399  |
| <b>Date &amp; Time:</b>        | August 20, 2014, 14:55 Local | <b>Registration:</b>    | N802BB      |
| <b>Aircraft:</b>               | AIR TRACTOR INC AT-802A      | <b>Aircraft Damage:</b> | Substantial |
| <b>Defining Event:</b>         | Loss of control in flight    | <b>Injuries:</b>        | 1 Fatal     |
| <b>Flight Conducted Under:</b> | Part 137: Agricultural       |                         |             |

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## Analysis

The pilot was applying chemicals to a soybean field when the airplane struck trees located at the edge of the field and then impacted the ground. Data from the onboard aerial spray operations computer revealed that the pilot was making spray passes to the east and west over the soybean field at low altitude and reversing course between each pass by making a left 180-degree turn. The data stopped before the tree impact; however, the wreckage path began just east of the north-south line of 50-ft-tall trees and was oriented to the east indicating the pilot was likely about to begin a spray pass to the east when the airplane impacted the trees. Examination of the wreckage revealed no evidence of preexisting anomalies or malfunctions. The propeller blades exhibited signatures consistent with power at the time of impact, and several tree limbs were found along the debris path with smooth, 45-degree cuts. Toxicology testing and autopsy results on the pilot revealed no evidence of an incapacitating event.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot's failure to see and avoid trees during a low-level aerial application operation.

## Findings

|                             |                                    |
|-----------------------------|------------------------------------|
| <b>Aircraft</b>             | Altitude - Not attained/maintained |
| <b>Personnel issues</b>     | Monitoring environment - Pilot     |
| <b>Personnel issues</b>     | Identification/recognition - Pilot |
| <b>Environmental issues</b> | Tree(s) - Contributed to outcome   |

## Factual Information

### History of Flight

|                                   |  |
|-----------------------------------|--|
| <b>Maneuvering-low-alt flying</b> | Collision with terr/obj (non-CFIT)         |
| <b>Maneuvering-low-alt flying</b> | Loss of control in flight (Defining event) |
| <b>Uncontrolled descent</b>       | Collision with terr/obj (non-CFIT)         |

On August 20, 2014, about 1455 central daylight time, an Air Tractor AT-802A, N802BB, registered to Bonne Idee Aero Service Inc., was substantially damaged when it impacted trees and a bean field in Parsons, Tennessee. The commercial pilot was fatally injured. Visual meteorological conditions prevailed, and the airplane, which departed Beech River Regional Airport (PVE), Lexington-Parsons, Tennessee, was not operating on a flight plan. The local aerial application flight began around 1440 and was conducted under the provisions of 14 Code of Federal Regulations Part 137.

A witness to the accident posted on a social media website that the airplane was flying "fast and low" over the witness's house, which was near the field. Then, the witness watched the airplane "[pull] up to miss the treeline, and seconds later [the airplane] hit the ground."

### Pilot Information

|                                  |                                       |  |                |
|----------------------------------|---------------------------------------|--|----------------|
| <b>Certificate:</b>              | Commercial                            | <b>Age:</b>                              | 29, Male       |
| <b>Airplane Rating(s):</b>       | Single-engine land; Multi-engine land | <b>Seat Occupied:</b>                    | Single         |
| <b>Other Aircraft Rating(s):</b> | None                                  | <b>Restraint Used:</b>                   | 4-point        |
| <b>Instrument Rating(s):</b>     | Airplane                              | <b>Second Pilot Present:</b>             | No             |
| <b>Instructor Rating(s):</b>     | None                                  | <b>Toxicology Performed:</b>             | Yes            |
| <b>Medical Certification:</b>    | Class 1 Without waivers/limitations   | <b>Last FAA Medical Exam:</b>            | April 11, 2013 |
| <b>Occupational Pilot:</b>       | Yes                                   | <b>Last Flight Review or Equivalent:</b> |                |
| <b>Flight Time:</b>              | 3600 hours (Total, all aircraft)      |  |                |

According to FAA records, the pilot held a commercial pilot certificate for airplane single engine land, multiengine land, and instrument airplane. He held a first-class medical certificate that was issued April 11, 2013. At that time, the pilot reported 3,600 total hours of flight time, of which, 250 hours were in the previous six months of the medical exam. At the time of this writing, no pilot logs have been located.

## Aircraft and Owner/Operator Information

|                                      |                                |                                       |                             |
|--------------------------------------|--------------------------------|---------------------------------------|-----------------------------|
| <b>Aircraft Make:</b>                | AIR TRACTOR INC                | <b>Registration:</b>                  | N802BB                      |
| <b>Model/Series:</b>                 | AT-802A                        | <b>Aircraft Category:</b>             | Airplane                    |
| <b>Year of Manufacture:</b>          | 1999                           | <b>Amateur Built:</b>                 |                             |
| <b>Airworthiness Certificate:</b>    | Restricted (Special)           | <b>Serial Number:</b>                 | 802A-0079                   |
| <b>Landing Gear Type:</b>            | Tailwheel                      | <b>Seats:</b>                         | 1                           |
| <b>Date/Type of Last Inspection:</b> | May 15, 2014 100 hour          | <b>Certified Max Gross Wt.:</b>       |                             |
| <b>Time Since Last Inspection:</b>   |                                | <b>Engines:</b>                       | 1 Turbo prop                |
| <b>Airframe Total Time:</b>          | 8797 Hrs as of last inspection | <b>Engine Manufacturer:</b>           | Pratt and Whitney           |
| <b>ELT:</b>                          | Installed                      | <b>Engine Model/Series:</b>           | PT6-A-65AG                  |
| <b>Registered Owner:</b>             | BONNE IDEE AERO SERVICE INC    | <b>Rated Power:</b>                   | 1220 Horsepower             |
| <b>Operator:</b>                     | Ag Air, LLC                    | <b>Operating Certificate(s) Held:</b> | Agricultural aircraft (137) |

According to FAA records, the airplane was issued a restricted, agriculture and pest control airworthiness certificate in 1999 and registered to Bonne Idee Aero Service, Inc. on August 11, 2007. It was equipped with a Pratt and Whitney Canada, PT6-A engine. According to airplane maintenance logbooks, the most recent annual inspection was performed on May 15, 2014, and at that time, the airplane had accumulated 8,797.0 hours of total time in service.

## Meteorological Information and Flight Plan

|   |                                  |   |                   |
|---|----------------------------------|---|-------------------|
| <b>Conditions at Accident Site:</b>     | Visual (VMC)                     | <b>Condition of Light:</b>                  | Day               |
| <b>Observation Facility, Elevation:</b> | MKL,422 ft msl                   | <b>Distance from Accident Site:</b>         | 38 Nautical Miles |
| <b>Observation Time:</b>                | 14:53 Local                      | <b>Direction from Accident Site:</b>        | 260°              |
| <b>Lowest Cloud Condition:</b>          | Few / 4200 ft AGL                | <b>Visibility</b>                           | 10 miles          |
| <b>Lowest Ceiling:</b>                  | None                             | <b>Visibility (RVR):</b>                    |                   |
| <b>Wind Speed/Gusts:</b>                | 6 knots /                        | <b>Turbulence Type Forecast/Actual:</b>     | /                 |
| <b>Wind Direction:</b>                  | 220°                             | <b>Turbulence Severity Forecast/Actual:</b> | /                 |
| <b>Altimeter Setting:</b>               | 30.01 inches Hg                  | <b>Temperature/Dew Point:</b>               | 34°C / 23°C       |
| <b>Precipitation and Obscuration:</b>   | No Obscuration; No Precipitation |   |                   |
| <b>Departure Point:</b>                 | Parsons, TN (PVE)                | <b>Type of Flight Plan Filed:</b>           | None              |
| <b>Destination:</b>                     | Parsons, TN (PVE)                | <b>Type of Clearance:</b>                   | None              |
| <b>Departure Time:</b>                  | 14:40 Local                      | <b>Type of Airspace:</b>                    |                   |

The 1453 recorded weather observation at McKeller-Sipes Regional Airport (MKL) , Jackson,

Tennessee, located approximately 38 miles to the southwest of the accident location, included wind from 220 at 6 knots, visibility 10 miles, few clouds at 4,200 feet above ground level, temperature 34 degrees C, dew point 23 degrees C; barometric altimeter 30.01 inches of mercury.

### Wreckage and Impact Information

|                            |         |                             |                           |
|----------------------------|---------|-----------------------------|---------------------------|
| <b>Crew Injuries:</b>      | 1 Fatal | <b>Aircraft Damage:</b>     | Substantial               |
| <b>Passenger Injuries:</b> |         | <b>Aircraft Fire:</b>       | None                      |
| <b>Ground Injuries:</b>    | N/A     | <b>Aircraft Explosion:</b>  | None                      |
| <b>Total Injuries:</b>     | 1 Fatal | <b>Latitude, Longitude:</b> | 35.704723,-88.145278(est) |

The initial tree impact occurred on flat terrain in the vicinity of 35 degrees, 42 minutes, 28 seconds north latitude, 088 degrees, 8 minutes, 49 seconds west longitude, at an elevation of about 455 feet. The trees that were impacted were approximately 50 feet tall. The wreckage path, which began with a separated propeller blade was headed about 107 degrees magnetic. Approximately 65 feet beyond the initial tree impact point, there was a 1-foot-deep, 5-foot-long crater with three propeller blades that were separated from the propeller hub located in the vicinity. There were several yellow paint chips located on the ground in between the initial tree strike and the initial ground impact point. The main wreckage came to rest inverted on a heading of 208 degrees. The debris path extended approximately 340 feet beyond the initial ground impact point. An odor similar to Jet A fuel was noted in the vicinity of the wreckage. Several sections of soy beans in the vicinity of the wreckage exhibited blight, consistent with fuel spillage.

The airplane was fractured into multiple sections and pieces, with all flight control surfaces located at the scene. Flight control continuity was confirmed via the control cables from the cockpit to the rudder, and through push rod and bellcrank fractures to the ailerons and elevators.

The front section of the fuselage was impact damaged and bent in the positive direction. The canopy section was crushed and several pieces of the canopy were located along the debris path. In addition, sections from the top of the fuselage, cockpit instruments, and the cockpit panel were located along the debris path. The top section of the fuselage that spanned about 8 feet behind the canopy exhibited crush damage. The seat remained attached to the fuselage at all attach points. Both main landing gear were located about 160 feet beyond the main wreckage. The left and right main landing gear were about 50 feet apart.

The right horizontal stabilizer, vertical stabilizer, and left horizontal stabilizer were partially separated from the empennage and exhibited crush damage.

The left and right wing remained attached to the fuselage. The entire span of the leading edge exhibited

aft crush damage. The flaps and ailerons remained attached to the respective wings. The left aileron trim tab was partially separated but remained attached through the outboard attach point. The left wing tip was separated and located along the debris path.

Examination of the engine revealed that soil was found in the gas generator case and throughout the combustion section, the axial turbine blade tips exhibited smearing and the turbine shroud exhibited corresponding circumferential rubbing, and the compressor disc outer rim and blade platforms exhibited circumferential rubbing. The accessory section of the engine was separated and located approximately 30 feet beyond the initial ground impact point.

The fuel control was found separated in the debris path. Fluid similar in odor and color as Jet A fuel drained from the unit. The fuel pump was located along the debris path and contained a fluid similar in odor and color as Jet A fuel. Several sections of fuel lines were located along the debris path.

The five propeller blades that were impact separated from the propeller hub were located along the debris path and exhibited torsional bending and chordwise scratching. In addition, several pieces of the impacted tree were recovered that exhibited an approximate 45 degree angle cut and exhibited black paint transfer along the cuts.

Several instruments were separated from the panel and located along the debris path. The Hobbs meter was located and indicated 9047.0 hours of flight time. The flap actuator located underneath the cockpit was fractured and measured to a flap setting that corresponded to about 25 degrees of flaps.

## **Flight recorders**

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The airplane was equipped with a Hemisphere AgJunction Satloc M3 Bantam, which was designed to programmatically control agricultural, aerial spray operations based on vendor and user specified prescription maps. The Satloc M3 recorded various parameters throughout the accident flight.

According to the data, the accident airplane flew multiple passes on a field 6 miles to the southeast of the accident location. Then, at 14:52, the airplane began spraying the field in the vicinity of the accident site. Multiple passes were performed with the lowest recorded altitude of 401 feet above mean sea level. Then, at 14:55:07, the last data point was recorded in the vicinity of the main wreckage.

## **Medical and Pathological Information**

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An autopsy was performed on the pilot on August 21, 2014, by the Office of the Medical Examiner, Nashville, Tennessee. The autopsy findings included "multiple blunt force injuries," which was also listed as the cause of death.

Forensic toxicology was performed on specimens from the pilot by the FAA Bioaeronautical Sciences

Research Laboratory, Oklahoma City, Oklahoma. The toxicology report stated no ethanol was detected in the vitreous fluid and no drugs were detected in the blood.

## Administrative Information

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|--|---|
| <b>Investigator In Charge (IIC):</b>     | Moats, Heidi  |
| <b>Additional Participating Persons:</b> | Gregory S Franklin; FAA/FSDO; Memphis, TN<br>Kyle Schroeder; Air Tractor; Olney, TX                   |
| <b>Original Publish Date:</b>            | December 9, 2015  |
| <b>Last Revision Date:</b>               |   |
| <b>Investigation Class:</b>              | <a href="#">Class</a>   |
| <b>Note:</b>                             | The NTSB traveled to the scene of this accident.  |
| <b>Investigation Docket:</b>             | <a href="https://data.nts.gov/Docket?ProjectID=89921">https://data.nts.gov/Docket?ProjectID=89921</a> |

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).