Aviation Investigation Final Report

Location:	Brinson, Georgia	**Accident Number:**	ERA09LA385
Date & Time:	July 7, 2009, 13:00 Local	**Registration:**	N8587S
Aircraft:	AIR TRACTOR INC AT-301	**Aircraft Damage:**	Substantial
Defining Event:	Aerodynamic stall/spin	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The pilot was progressing with his aerial application training. He was supposed to depart the airport, perform steep turns and flight at minimum controllable airspeed, drop water at a designated spot about 3/4 mile from the airport, and return for landing. The airplane was observed about 5 miles west of the airport, in level flight from north to south. The airplane then made a left U-turn and flew from south to north. The airplane made another left turn, toward the west, and started climbing. The airplane then released water and instantly began a fast spiral straight down to the ground, with the water following. Witnesses heard loud, continuous engine noise throughout the accident sequence and several examinations of the wreckage did not reveal evidence of any preimpact mechanical malfunctions. The pilot received his private pilot certificate about 5 weeks prior to the accident and had conducted his previous training in an airplane with less than one-third the horsepower and one-half the weight-carrying capacity as the accident airplane. The pilot had accumulated 2 hours of flight experience in the accident airplane when the accident occurred. Additionally, both airplanes displayed a tendency to pitch up during a water drop maneuver, though the accident airplane displayed this characteristic more severely due to its higher weight. This tendency would require a pilot to aggressively push the flight control stick forward, near the stop, to counteract the force.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to maintain adequate airspeed while maneuvering, which resulted in an aerodynamic stall. Contributing to the accident was the pilot's lack of experience in the make and model airplane.

Findings

Aircraft	Airspeed - Not attained/maintained
Personnel issues	Aircraft control - Pilot
Personnel issues	Total experience w/ equipment - Pilot

Factual Information

History of Flight

Maneuvering	Aerodynamic stall/spin (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On July 7, 2009, about 1300 eastern daylight time, an Air Tractor AT-301, N8587S, operated by Ag-Flight Inc., was substantially damaged during impact with terrain near Brinson, Georgia. The certificated private pilot was killed. Visual meteorological conditions prevailed and no flight plan was filed for the local instructional flight conducted under the provisions of 14 Code of Federal Regulations Part 91. The flight originated from Decatur County Industrial Air Park (BGE), Bainbridge, Georgia, about 1250.

According to the pilot's flight instructor, and two ground personnel that fueled the airplane, the pilot was progressing with his aerial application training. The pilot initially departed, practiced steep turns, and practice flight at minimum controllable airspeed. The pilot then returned to BGE and completed five supervised takeoffs and landings. The airplane was subsequently fueled and 50 to 100 gallons of water was also added. The pilot departed again, completed the same maneuvers, dropped the water, and returned to BGE. Approximately 100 to 200 gallons of water was then added and the pilot departed again. He completed the same maneuvers, dropped the water, and returned to BGE. The airplane was refueled again and 200 gallons (or more) of water was added. The pilot departed again to review the same maneuvers; however, no further contact was made with the airplane.

A witness, who lived in the vicinity of the accident site, reported seeing the accident airplane flying about 700 feet above the ground. The airplane flew straight-and-level, traveling from north to south. The airplane then made a left U-turn and flew from south to north. The airplane made another left turn, toward west, and started climbing. The witness then observed a large stream of water coming from the airplane, which looked like smoke. Immediately after the water was observed, the airplane began a fast spiral, straight down to the ground, with the water following. The witness further stated that he heard "real loud" continuous engine noise throughout the accident sequence.

The witness's wife recalled similar events; however, she did not recall seeing the water until after the airplane began to spiral downward.

The pilot's flight instructor stated that there was a designated site for students to drop water, located about 3/4 mile south of the flight school. The procedure to drop water was for the students to return to the airport area after practicing maneuvers at the higher weight, slow the airplane to 100 knots (with reduction in power, not by using flaps), fly over the field near treetop level, drop the water, then land at the airport. The pilot's flight instructor added that the

accident site was about 5 miles west of the airport, and there would be no reason for the pilot to drop water at that location, unless he was having some sort of problem.

The airplane came to rest nose down, in a peanut field. A Federal Aviation Administration (FAA) inspector examined the wreckage at the accident site, and again after it was recovered to a hangar. Additionally, an independent mechanic subsequently examined the wreckage. None of the three examinations revealed evidence of any preimpact mechanical malfunctions. The accident site was examined by the FAA inspector and an Environmental Protection Agency employee revealed only two small areas of fuel spill, near where the engine came to rest. The vegetation in the area surrounding the airplane remained undamaged.

The elevator control system was intact and control continuity was confirmed from the control stick in the cockpit, to the control rod in the aft fuselage, to the elevator horn, and then to the elevator. Continuity was also confirmed from the rudder pedals to the rudder. Right aileron control continuity was confirmed the aileron to a control rod break at the wing root, to the control stick in the cockpit. Left aileron control continuity was confirmed from the aileron to the control stick in the cockpit. Elevator trim control was found in the full forward (nose down) position and continuity was confirmed from the cockpit to the elevator trim tab.

One propeller blade remained attached to the engine, and exhibited s-bending, chordwise scratching, and leading edge gouging. The other propeller blade had separated near the hub, and exhibited twisting, tip-curling, leading edge gouging, and chordwise scratching. The throttle and mixture controls were found in the idle/cutoff position. The propeller control lever was mid-range. Movement of all three levers revealed that the associated control rods and cables moved. The wing flaps were found in the extended position. The spark plugs were removed from the engine and no anomalies were noted. Due to impact damage, the engine crankshaft could only be move through approximately 60 degrees of rotation. When the crankshaft was rotated via the propeller, all pistons and the magneto drives actuated. When the pressure and return fuel lines were removed from the carburetor, fuel was observed in both lines.

The single-seat, low-wing, fixed-gear airplane, serial number 301-0153, was manufactured in 1978. It was powered by a Pratt & Whitney R1340, 600-horsepower radial engine. The airplane's most recent 100-hour inspection was completed on June 3, 2009, at a total airframe time of 9,004 hours. The airplane accumulated an additional 20 hours of operation, from the time of the last inspection, until the accident. At the time of the inspection, the engine had accumulated 650 hours of operation since major overhaul.

The pilot, age 31, held a private pilot certificate, with a rating for airplane single-engine land, which he obtained on May 31, 2009. His most recent FAA second-class medical certificate was issued on April 27, 2009. The pilot's application for the most recent airman medical certificate indicated “No” to “Do You Currently Use Any Medication” and “substance abuse or use of illegal substance in the last 2 years.” Review of the pilot's logbook revealed that he had accumulated a total flight experience of approximately 239 hours. According to the pilot's

flight instructor, the pilot had not flown the make and model accident airplane prior to the day of the accident. During the day of the accident, the pilot accumulated about 2 hours of experience in the accident airplane before the mishap. The pilot's flight instructor further stated that the pilot previously performed three water drops in a Piper Pawnee, which was equipped with a 235-horsepower engine and held 100 gallons of water. The accident airplane was equipped with a 600-horsepower engine and held 200 gallons of water.

The pilot's flight instructor also stated that during a water drop in either airplane, the control stick must be pushed aggressively forward, near the stop, to counteract the pitching up moment of the airplane. The pitch up is not due to a change in center of gravity, but rather a reduction in weight for the given lift generated. He added that the Air Tractor would pitch up more aggressively than the Pawnee, due to the higher weight.

An autopsy was performed on the pilot by the State of Georgia Bureau of Investigation, Forensic Sciences Division, on July 9, 2009. The autopsy report noted the cause of death as "traumatic injuries due to a plane crash."

Toxicological testing was performed on the pilot by the FAA Bioaeronautical Science Research Laboratory, Oklahoma City, Oklahoma. The testing revealed:

"0.023 (ug/mL, ug/g) OXYCODONE detected in Urine
OXYCODONE NOT detected in Blood
0.0212 (ug/ml, ug/g) TETRAHYDROCANNABINOL (MARIHUANA) detected in Lung
TETRAHYDROCANNABINOL (MARIHUANA) NOT detected in Blood
0.0566 (ug/ml, ug/g) TETRAHYDROCANNABINOL CARBOXYLIC ACID (MARIHUANA) detected in Urine
0.0056 (ug/ml, ug/g) TETRAHYDROCANNABINOL CARBOXYLIC ACID (MARIHUANA) detected in Blood
TETRAHYDROCANNABINOL CARBOXYLIC ACID (MARIHUANA) detected in Lung"

The recorded weather at BGE, at 1257, was: wind from 260 degrees at 6 knots; visibility 10 miles; scattered clouds at 2,300 feet; scattered clouds at 2,900 feet; scattered clouds at 3,400 feet; temperature 28 degrees Celsius; dew point 23 degrees Celsius; altimeter 29.89 inches of mercury.

Pilot Information

Certificate:	Private	**Age:**	31,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Single
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	April 27, 2009
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	May 31, 2009
Flight Time:	239 hours (Total, all aircraft), 2 hours (Total, this make and model), 180 hours (Pilot In Command, all aircraft), 198 hours (Last 90 days, all aircraft), 105 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	AIR TRACTOR INC	**Registration:**	N8587S
Model/Series:	AT-301	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Restricted (Special)	**Serial Number:**	301-0153
Landing Gear Type:	Tailwheel	**Seats:**	1
Date/Type of Last Inspection:	June 3, 2009 100 hour	**Certified Max Gross Wt.:**	5000 lbs
Time Since Last Inspection:	20 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	9004 Hrs as of last inspection	**Engine Manufacturer:**	P&W
ELT:	Not installed	**Engine Model/Series:**	R1340 SERIES
Registered Owner:	BILLY HOWELL	**Rated Power:**	600 Horsepower
Operator:	AG-FLIGHT INC	**Operating Certificate(s) Held:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	BGE,141 ft msl	**Distance from Accident Site:**	5 Nautical Miles
Observation Time:	12:57 Local	**Direction from Accident Site:**	30°
Lowest Cloud Condition:	Scattered / 2300 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	260°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.88 inches Hg	**Temperature/Dew Point:**	28°C / 23°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Bainbridge, GA (BGE)	**Type of Flight Plan Filed:**	None
Destination:	Bainbridge, GA (BGE)	**Type of Clearance:**	None
Departure Time:	12:50 Local	**Type of Airspace:**	

Airport Information

Airport:	Decatur County Industrial Air BGE	**Runway Surface Type:**	
Airport Elevation:	141 ft msl	**Runway Surface Condition:**	
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	30.946111,-84.723892

Administrative Information

Investigator In Charge (IIC):	Gretz, Robert
Additional Participating Persons:	Michael A Pupek; FAA/FSDO; Atlanta, GA
Original Publish Date:	March 3, 2010
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=74219