



Aviation Investigation Final Report

Location:	Qulin, Missouri	Accident Number:	CEN18LA194
Date & Time:	May 27, 2018, 12:00 Local	Registration:	N6180J
Aircraft:	AIR TRACTOR INC AT 502B	Aircraft Damage:	Substantial
Defining Event:	Runway excursion	Injuries:	1 None
Flight Conducted Under:	Part 137: Agricultural		

Analysis

The pilot reported that the agricultural airplane was loaded with 2,700 lbs of product and 130 to 140 gallons of fuel. He stated that the engine gauges had normal indications but that, during the takeoff, the airplane's tailwheel was still on the ground when the airplane was about 3/4 down the runway, and the airplane did not become airborne before the end of the runway. When the airplane reached the end of the runway, he applied full flaps to "jump" a drainage ditch at the end. The airplane then impacted the ground on the opposite side of the ditch and incurred substantial damage to the wings, landing gear, aft fuselage, and tail surfaces. Postaccident examination of the airplane revealed no preimpact mechanical malfunctions or failures that would have precluded normal operation. Based on the reported fuel and product load on board, the airplane's calculated gross weight was about 523-574 lbs over the airplane's maximum gross weight. In addition, the density altitude at the time of the accident was about 2,200 ft.

Probable Cause and Findings

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

The pilot's improper weight-and-balance calculations and his decision to take off with the airplane at a high gross weight in high density altitude conditions, which resulted in an attempted takeoff that exceeded the airplane's performance capability. Also causal was the pilot's failure to abort the takeoff while sufficient runway remained.

Findings

Personnel issues	Weight/balance calculations - Pilot
Aircraft	(general) - Capability exceeded
Personnel issues	Decision making/judgment - Pilot
Personnel issues	Lack of action - Pilot

Factual Information

History of Flight

Takeoff	Runway excursion (Defining event)
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On May 27, 2018, about 1200 central daylight time, an Air Tractor AT502B, N6180J, impacted terrain during takeoff from a private airstrip near Qulin, Missouri. The pilot was not injured, and the airplane sustained substantial damage. The airplane was registered to and operated by Danny's Air Agri Service, Inc. under the provisions of 14 *Code of Federal Regulations* Part 137 as an aerial application flight. Visual meteorological conditions prevailed for the flight, which operated without a flight plan. The local flight was originating at the time of the accident.

The pilot reported that the airplane was loaded with 2,700 lbs of chemical and he was using an airstrip owned by one of his customers. He noted that he had been using the airstrip for the past 14 years and knew how the airplane performed when taking off from this airstrip. He stated that the engine gauges were all indicating normal, but during the takeoff, the tailwheel of the airplane was still on the ground after the airplane had used about 3/4 of the runway length. At this point, he checked the engine instruments, and all were still indicating within normal parameters. When the airplane reached the end of the runway it was still not airborne, and the pilot applied full flaps to "jump" the ditch at the end of the runway. The airplane crossed the ditch and impacted the ground on the other side of the ditch.

Examination of the airplane after the accident confirmed substantial damage to both wings, landing gear, aft fuselage and tail surfaces. No preimpact anomalies were found that would have prevented normal operation, and the pilot didn't report any mechanical issues encountered during the flight.

The turf runway had a north-south orientation and was about 2,500 ft long. The takeoff was performed to the south. At the south end of the runway was a drainage ditch which separated two farm fields.

The pilot reported to Federal Aviation Administration inspectors that the airplane had between 130 and 140 gallons of fuel and 2,700 lbs of chemical on-board. Based on a fuel density of 6.7 lbs per gallon, and the airplane's empty weight of 4,778 lbs, the airplane's takeoff weight was calculated to be between 8,523 and 8,574 lbs. The maximum gross weight of the airplane was listed as 8,000 lbs.

At 1153, the recorded weather conditions at the Poplar Bluff Municipal Airport, Poplar Bluff, Missouri, about 12 nm north of the accident site were wind from 210 degrees at 5 kts, 10 sm visibility, clear skies, temperature 30° C, dewpoint 22° C, and an altimeter setting 29.92 inches of mercury.

Based on the reported weather conditions, the calculated density altitude was about 2,200 ft.

Pilot Information

Certificate:	Commercial	Age:	70,Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Single
Other Aircraft Rating(s):	None	Restraint Used:	4-point
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 2 With waivers/limitations	Last FAA Medical Exam:	April 9, 2018
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	April 5, 2017
Flight Time:	17616 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	AIR TRACTOR INC	Registration:	N6180J
Model/Series:	AT 502B B	Aircraft Category:	Airplane
Year of Manufacture:	1995	Amateur Built:	
Airworthiness Certificate:	Restricted (Special)	Serial Number:	502B-0329
Landing Gear Type:	Tailwheel	Seats:	1
Date/Type of Last Inspection:	January 15, 2018 Annual	Certified Max Gross Wt.:	8000 lbs
Time Since Last Inspection:		Engines:	1 Turbo prop
Airframe Total Time:	10219 Hrs as of last inspection	Engine Manufacturer:	Pratt & Whitney
ELT:		Engine Model/Series:	PT6A-45R
Registered Owner:		Rated Power:	1100 Horsepower
Operator:		Operating Certificate(s) Held:	Agricultural aircraft (137)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	POF,331 ft msl	Distance from Accident Site:	12 Nautical Miles
Observation Time:	11:53 Local	Direction from Accident Site:	340°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	5 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	210°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.9 inches Hg	Temperature/Dew Point:	30°C / 22°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Qulin, MO (PVT)	Type of Flight Plan Filed:	None
Destination:	Qulin, MO (PVT)	Type of Clearance:	None
Departure Time:	12:00 Local	Type of Airspace:	Class G

Airport Information

Airport:	Private PVT	Runway Surface Type:	Dirt;Grass/turf
Airport Elevation:	300 ft msl	Runway Surface Condition:	Dry
Runway Used:	18	IFR Approach:	None
Runway Length/Width:	2500 ft / 100 ft	VFR Approach/Landing:	None

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 None	Latitude, Longitude:	36.55722,-90.204719

Administrative Information

Investigator In Charge (IIC):	Brannen, John
Additional Participating Persons:	Travis Schwien; FAA STL FSDO; St Louis, MO
Original Publish Date:	June 3, 2020
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=97332

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).