Aviation Investigation Final Report

Location:	Sturgis, South Dakota	**Accident Number:**	CEN23LA244
Date & Time:	June 18, 2023, 13:30 Local	**Registration:**	N290LA
Aircraft:	AIR TRACTOR INC AT-502	**Aircraft Damage:**	Substantial
Defining Event:	Loss of control on ground	**Injuries:**	1 None
Flight Conducted Under:	Part 137: Agricultural		

Analysis

The pilot reported he departed in the airplane with about 660 lbs of fuel and about 3,500 lbs of liquid chemical for application to a pasture. After arriving at the pasture, the chemical dispersal system was malfunctioning, and the pilot decided to return to the airport. During the landing to the first quarter of the runway, the airplane was about 125 mph, with “half flap” applied, and the tailwheel was locked. As the tailwheel touched down on the dry concrete runway, the pilot initiated beta mode with the propeller, and the airplane “started veering to the right.” The pilot assessed that he “reversed the propeller too aggressively and too soon.” The airplane departed the runway to the right, the left main landing gear separated after impacting a ditch, and the airplane came to rest upright on a grass field. The pilot was able to egress from the airplane without further incident. The airplane sustained substantial damage to the fuselage and the left wing.

The operator reported there were no preimpact mechanical malfunctions or failures with the airframe or the engine that would have precluded normal operation. A postaccident examination of the chemical dispersal system found foreign object debris that was likely blocking the flow of the chemical. Title 14 *Code of Federal Regulations* Part 137 Agricultural Aircraft Operations does not contain full load landing training and recurrency requirements. The pilot reported the last time he performed a full load landing was about 2 years prior. The estimated density altitude for the airport was 6,101 ft.

Probable Cause and Findings

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

The pilot’s improper timing to initiate beta mode with the propeller and his failure to maintain directional during the full load landing that resulted in a runway excursion. Contributing to the accident was the pilot’s lack of recent experience with performing a full load landing and the high-density altitude that likely affected aircraft performance during the landing.

Findings

Personnel issues	Incorrect action sequence - Pilot
Personnel issues	Aircraft control - Pilot
Personnel issues	Decision making/judgment - Pilot
Personnel issues	Recent experience w/ equipment - Pilot
Aircraft	Directional control - Not attained/maintained
Environmental issues	High density altitude - Effect on equipment

Factual Information

History of Flight

Landing-flare/touchdown	Miscellaneous/other
Landing-flare/touchdown	Loss of control on ground (Defining event)
Landing-flare/touchdown	Attempted remediation/recovery
Landing-flare/touchdown	Runway excursion
Landing-flare/touchdown	Collision during takeoff/land
Post-impact	Landing gear collapse
Post-impact	Evacuation

Pilot Information

Certificate:	Commercial	**Age:**	35,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Single
Other Aircraft Rating(s):	None	**Restraint Used:**	5-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	April 18, 2023
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	May 22, 2022
Flight Time:	(Estimated) 1927 hours (Total, all aircraft), 690 hours (Total, this make and model), 1927 hours (Pilot In Command, all aircraft), 70 hours (Last 90 days, all aircraft), 22 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	AIR TRACTOR INC	**Registration:**	N290LA
Model/Series:	AT-502 A	**Aircraft Category:**	Airplane
Year of Manufacture:	2018	**Amateur Built:**	
Airworthiness Certificate:	Restricted (Special)	**Serial Number:**	502A-3137
Landing Gear Type:	Tailwheel	**Seats:**	1
Date/Type of Last Inspection:	January 15, 2023 Annual	**Certified Max Gross Wt.:**	10480 lbs
Time Since Last Inspection:	27 Hrs	**Engines:**	1 Turbo prop
Airframe Total Time:	487 Hrs at time of accident	**Engine Manufacturer:**	Pratt & Whitney Canada
ELT:	Not installed	**Engine Model/Series:**	PT6A-140AG
Registered Owner:	ASCEND AG INC	**Rated Power:**	867 Horsepower
Operator:	ASCEND AG INC	**Operating Certificate(s) Held:**	Agricultural aircraft (137)
Operator Does Business As:	ASCEND AG INC	**Operator Designator Code:**	3PJG

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KRCA,3278 ft msl	**Distance from Accident Site:**	20 Nautical Miles
Observation Time:	12:55 Local	**Direction from Accident Site:**	144°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	17 knots /	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	180°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	29.6 inches Hg	**Temperature/Dew Point:**	29°C / 9°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Sturgis, SD	**Type of Flight Plan Filed:**	VFR
Destination:	Sturgis, SD	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class G

Airport Information

Airport:	STURGIS MUNI 49B	**Runway Surface Type:**	Concrete
Airport Elevation:	3254 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	11	**IFR Approach:**	None
Runway Length/Width:	5100 ft / 75 ft	**VFR Approach/Landing:**	Full stop;Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	44.41817,-103.37577(est)

Administrative Information

Investigator In Charge (IIC):	Hodges, Michael
Additional Participating Persons:	Brandon Caneva; FAA Rapid City FSDO; Rapid City, SD
Original Publish Date:	July 27, 2023
Last Revision Date:	
Investigation Class:	Class 4
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=192396