

# Radio-frequency identification (RFID) tagging for tracking seedling nursery assets

NSC Winter Workshop, Prince George, BC

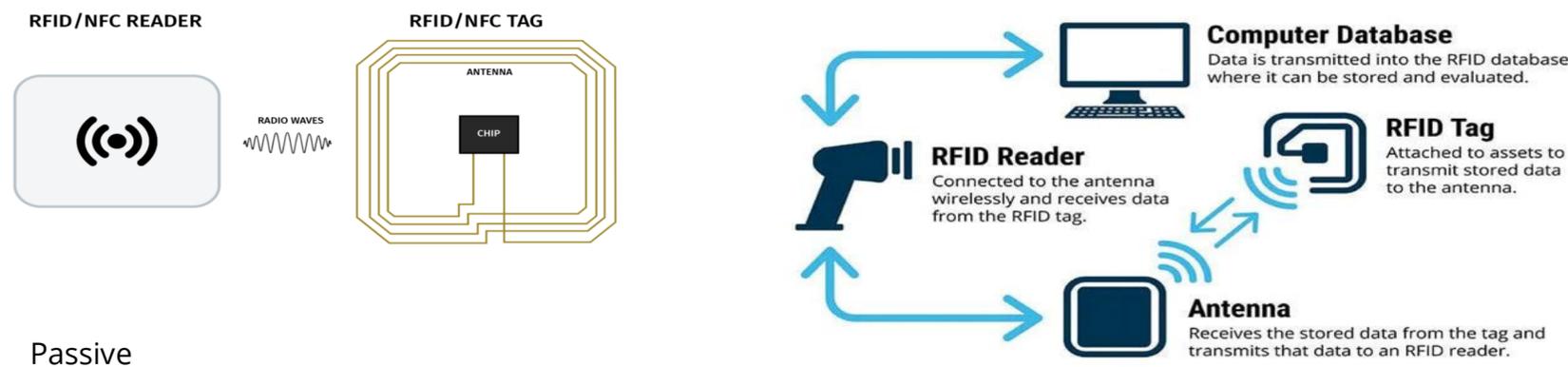
February 18, 2026



College of  
New Caledonia

# What are RFIDs?

- Radio Frequency Identification, IoT/RTLS
- RFID tags are made out of two pieces:
  - a micro chip (an integrated circuit which stores and processes information and modulates and demodulates radio-frequency signals)
  - an antenna for receiving and transmitting the signal
- Passive and Active
  - Passive: No power, cheaper tag (\$0.1-10), more expensive infrastructure, shorter range (20 ft., 6m), in/outdoors
  - Active: Battery<sup>1</sup>, more expensive tag (\$5-15), cheaper/faster to install infrastructure, longer range, higher precision (cm), outdoors. Example: BLE systems



# Pilot Study – PRT Red Rock

## Objective:

Assess technical feasibility and potential logistic hurdles of nursery asset tracking with RFIDs

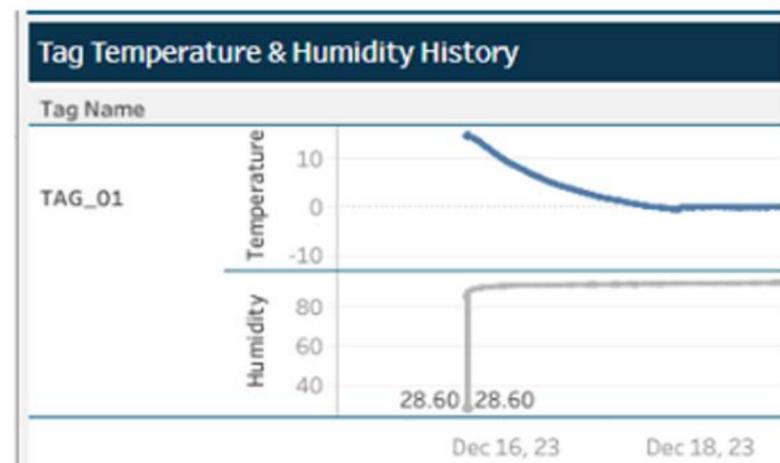
## Approach:

- Two available technologies to try
  - Passive tags (less accurate, no temp.)
  - Active tags
- Assets tracked: Cartons, pallets, forklifts, trucks
- Scope: Cold storage, thawing, transport
- Variables
  - Location (X, Y) i.e., out to thawing/on route/at camp
  - Times (arrival, departure, dwelling)
  - Temperature, Humidity
- Duration: 3 months (Dec-Feb 2023)



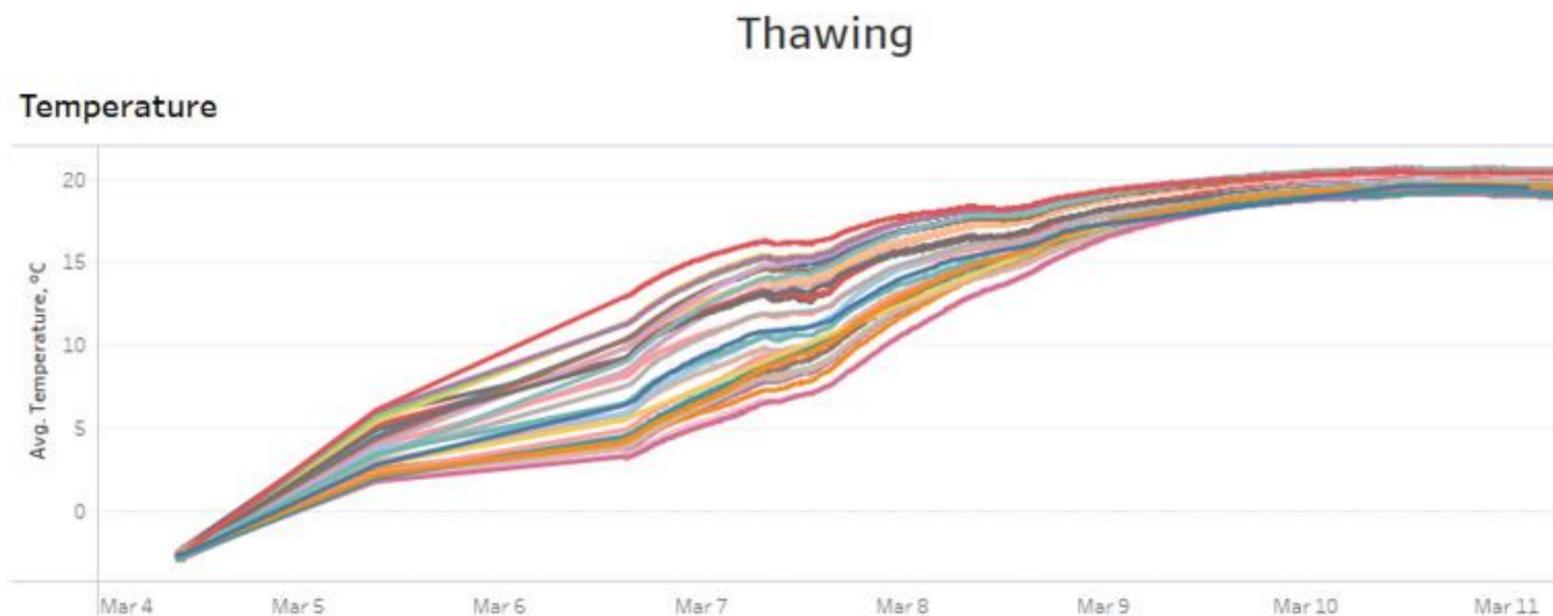
# RESULTS

**Freezing** was tracked at 5-minute intervals



100% accuracy at rack level inside the reefer!

**Thawing** was started after 10 weeks in the reefer and showed a gradual increase in temperature from -2.5°C to 20°C over 7 days.



Humidity between 85 to 99%

# RESULTS

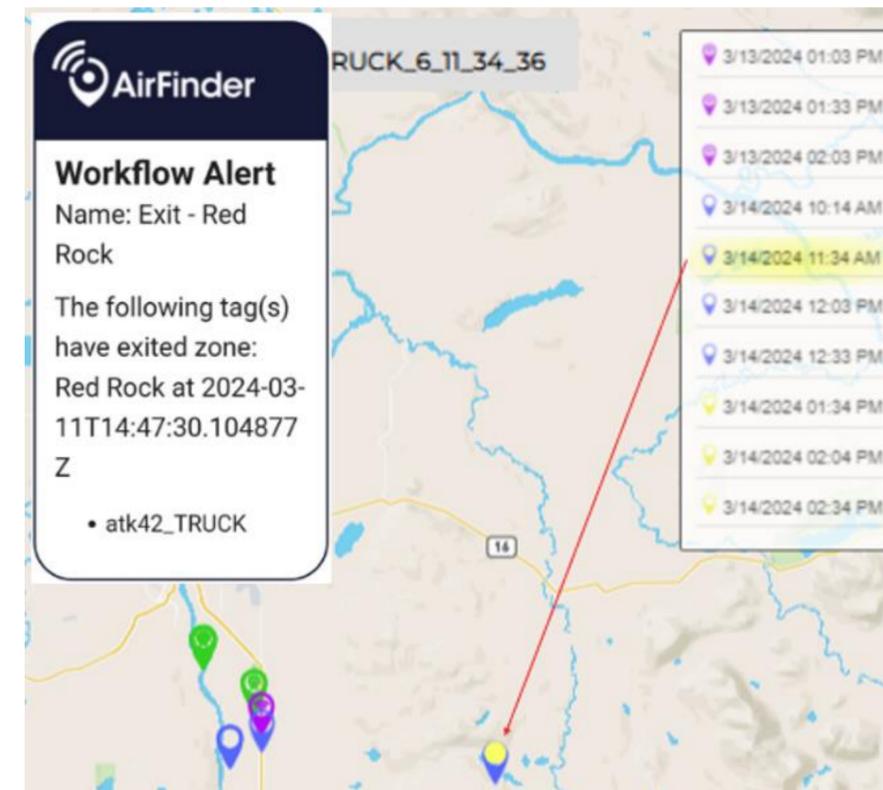
**Transport** was assessed using a geofence, i.e., Planting camp or block, plus nursery boundaries



Virtual geofence, outside cell reception zones and around nursery

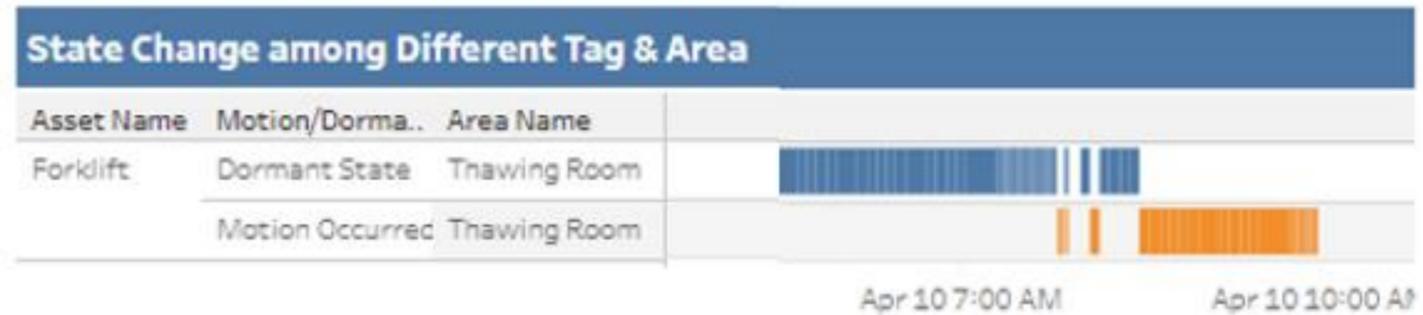
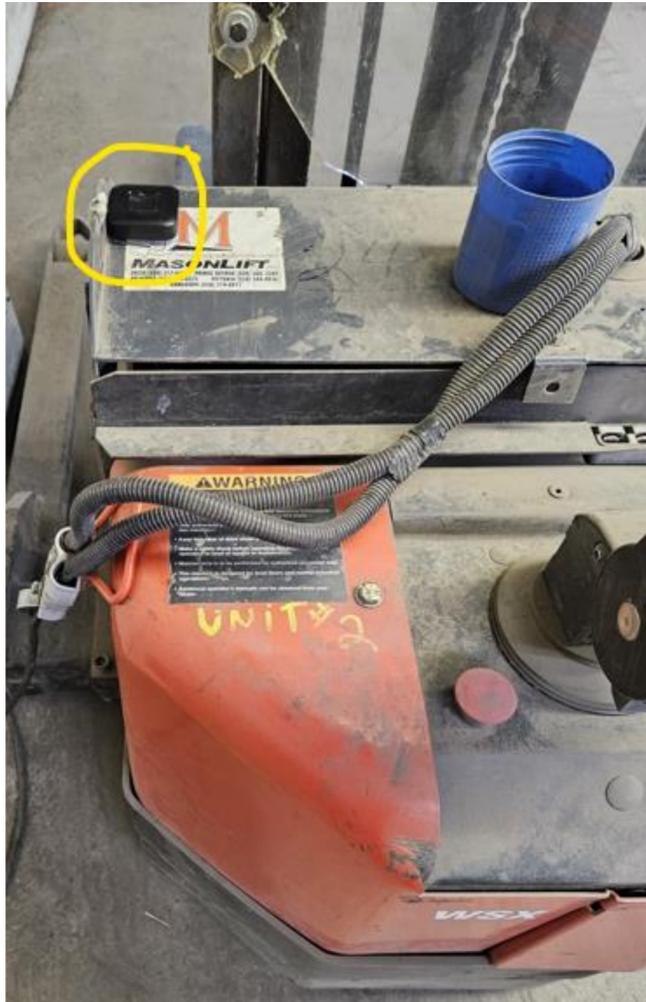


Truck motion tracking

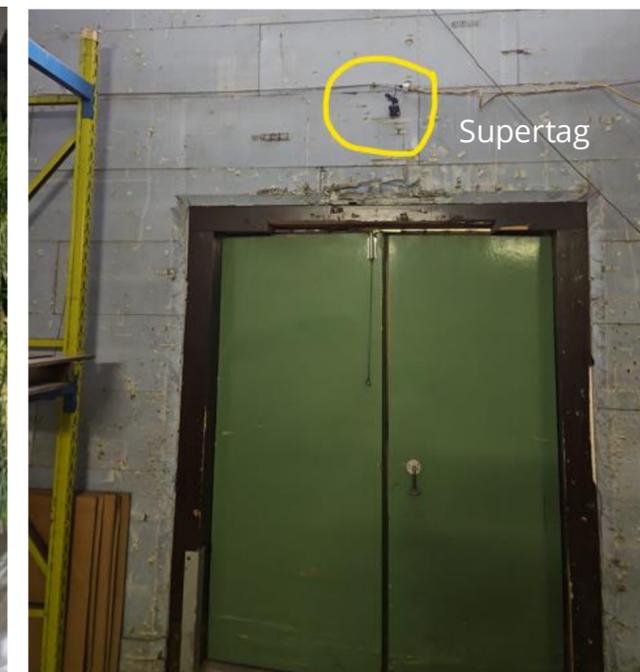


# RESULTS

Forklift motion (dormant versus in-motion times)

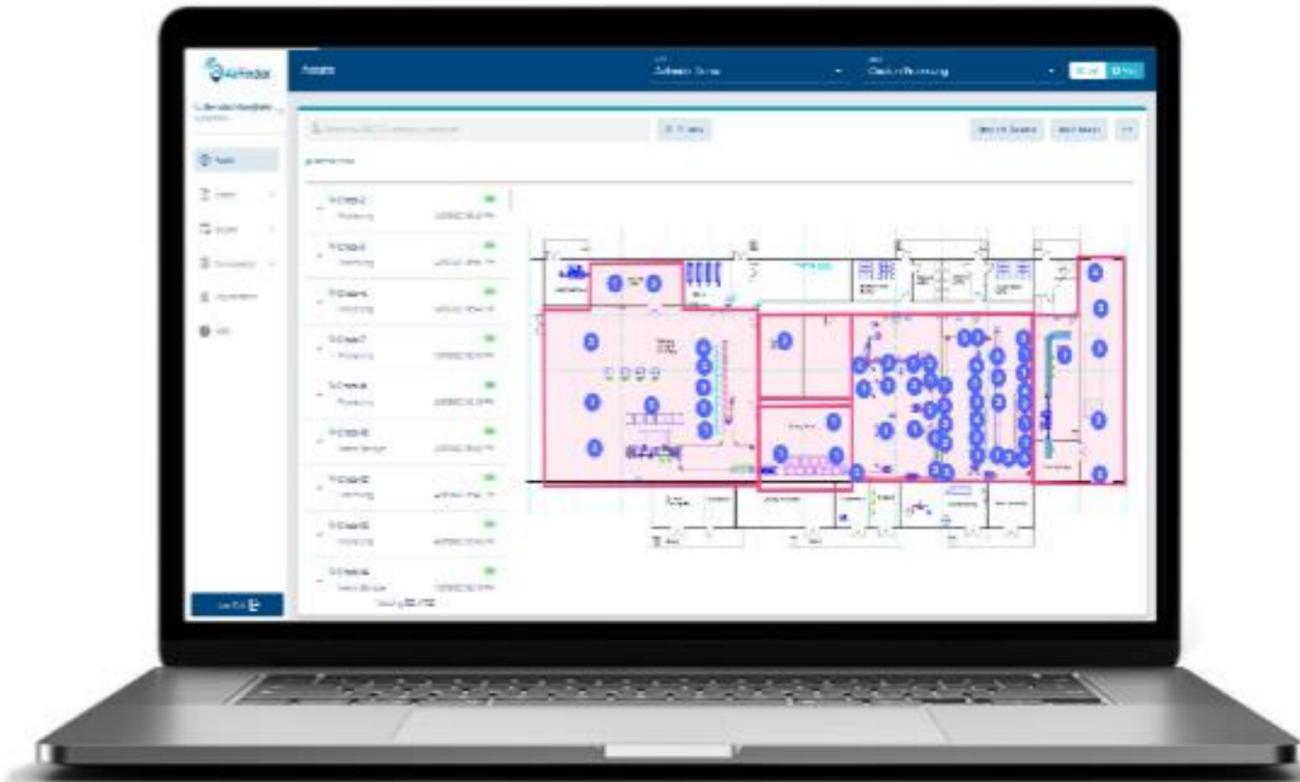
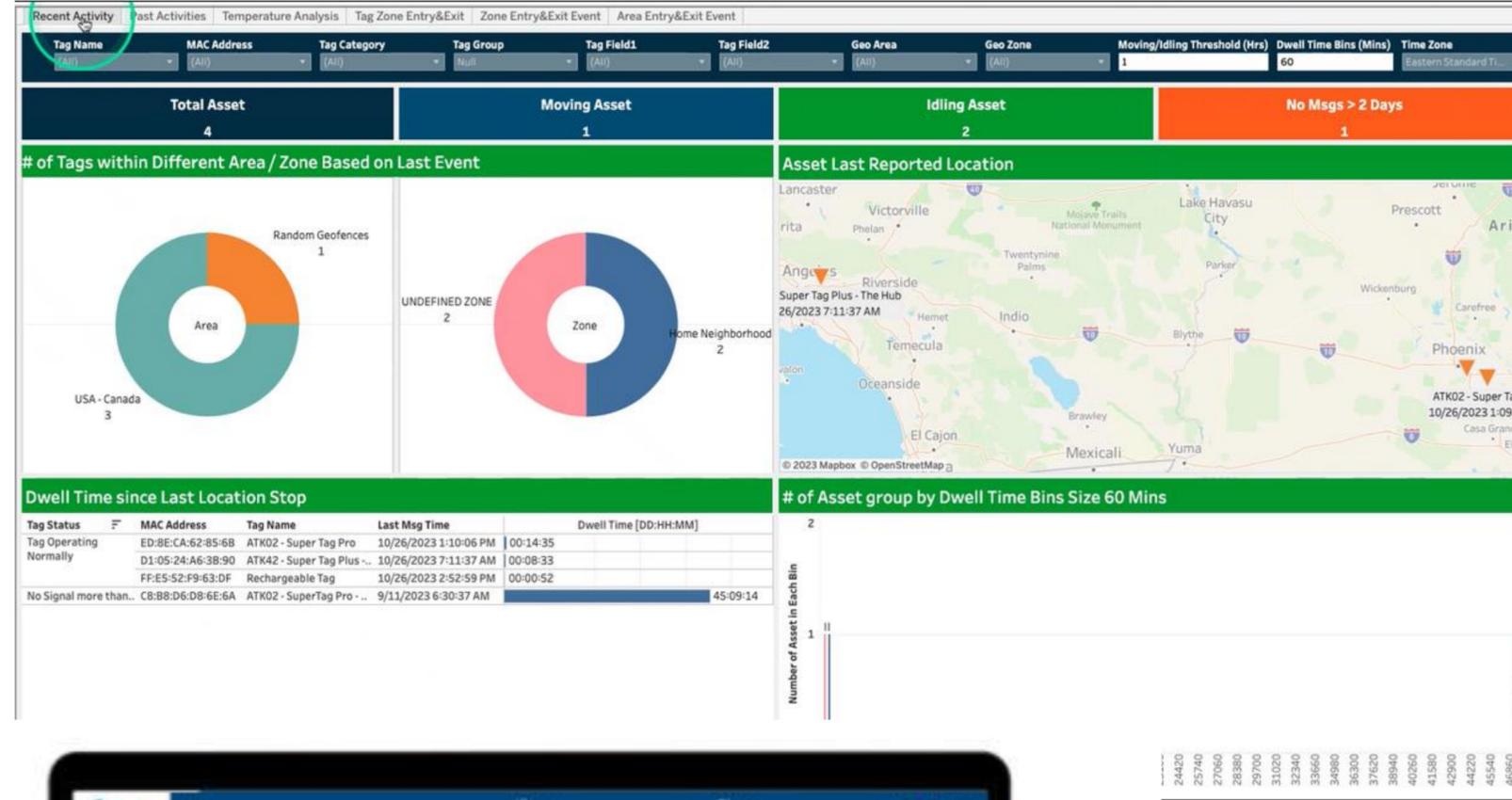
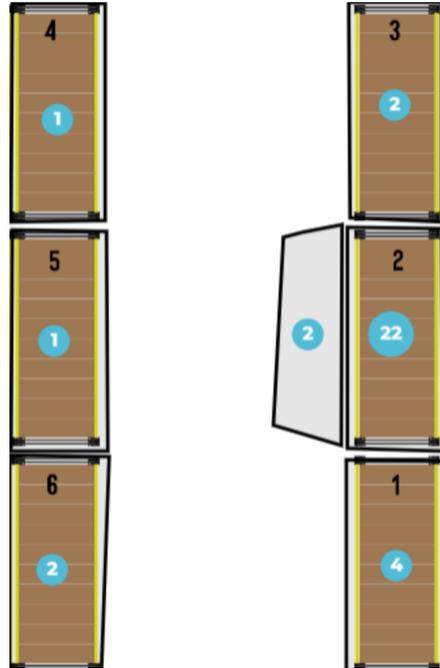


# Hardware & Setup



# RESULTS

## Hub - Interface



Indoor Mapping of Assets

# CONCLUSIONS

1. RFIDs can be used in forest nursery operations to track:
  - Carton and/or pallet location (100% accuracy at rack level)
  - Temperature and humidity inside box and/or room
  - Motion tracking
    - Leaving/entering perimeter
    - Location on the road
    - Forklift activity
2. More research is needed to assess economic feasibility of scaling-up
3. Tags, anyone? Partial approach?

 [Link to report](#)



# THANK YOU.

## Acknowledgements

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