FarmBeats: In the Field
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Challenge: Farm connectivity

3 miles away and obstructed by crops, trees, hills

- Cloud
- Farmers home/office
- Soil Moisture Sensors
- Drone Images
- Wind Speed/Direction Sensors
- Rainfall Sensors
Example: Panorama for Precision Spraying (320 acre field)
### Micro-Climate Variability

**Goal:**
Have a better understanding of weather impacts on all fields.

**Impact:**
Knowing micro-climates enables better application timing, risk management, and yield forecasting.

**Challenges:**
The farm is spread out over 30 miles (through the air) and the terrain is very hilly. All the mountains around the farm make radar unreliable.

**Real World Results:**
Utilizing TVWS, we are able to get better coverage on the farm to be able to know what weather conditions are like in all fields. Multiple days this spring, we were able to keep field operations running smoothly by quickly checking the conditions at our stations.
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Micro-Climate Forecasting

**Goal:**
Microclimate weather forecasting model based on FarmBeats sensors in the field.

**Impact:**
Knowing micro-climate predictions enables better modeling of plant diseases, application timing, and risk management.

**Challenges:**
Current forecast models are too general. Micro-climate forecasts can give sub field predictions.

**Real World Results:**
Forecast was for the low temperature to be 38 degrees. Micro-Climate forecast was for 31 degrees in lower areas of the field. Actual was 30 degrees. Instead of spraying a grass herbicide I waited and avoided significant crop damage in some of our most productive soil.