Weather Variability and the Impact on Agriculture

InfoAg 2017
The Problem:
The Earth’s Atmosphere is a Heat Engine... In transition

1°C warming of atmosphere...
Triples weather variance
Hot gets hotter • Cold gets colder
Dry gets dryer • Wet gets wetter
Agriculture Impact...
Yield and production risk

5.5 Quadrillion Ton Heat Engine

Extreme weather events (heatwaves / extreme precipitation)
1/1,000 days ⇒ now 1/200 days with atmospheric warming
Bulging Waistline: Hadley Cell Expansion

Expansion of the Hadley cell pushes descending air poleward
“Non-linearity in the power equation”

Munich Re: "It's as if the weather machine had changed up a gear.

Warmer Air Holds More Moisture and Energy

4% per °F or 7% per °C

More violent and frequent storms, once merely a prediction of climate models, are now a matter of observation

Hurricanes 25% bigger, thunderstorms 15%

"the upshot is that overall rainfall increases only 2 to 3 percent per degree of warming, whereas extreme rainfall increases 6 to 7 percent
Impact of a Warming Atmosphere on Agriculture: Events

- Pest and disease risk
- Increased rain variability
- Drought events
- Warmer night temperatures
- More extreme weather events

Less predictability and greater risk
Symmetrical information to optimize response

Need: Agricultural information solutions across the agricultural value chain

**Government+NGO**

- Policy
- Development

**Agribusiness**

- Research
- Input Supply
- Production

**Commodities**

- Financing
- Markets
- Consumption

SET NATIONAL AND BUSINESS PRIORITIES
IN-SEASON ACTIONABLE INSIGHTS
ANTICIPATE NEEDS AND MOVEMENTS BASED ON TRENDS AND FORECASTS
Hyper-local Agriculture Intelligence

aWhere constructs a weather station’s worth of data every 9km across the planet

Satellite Radar

Ground Radar

Weather Station

aWhere Station

Temperature, Humidity etc.

Precipitation

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Better Information enables Field Insight

- When to plant?
- When and how much to irrigate?
- What pests to scout and treat for?
- When and how much to fertilize?

- When will harvest be?
- How much yield is expected?
- When an insurance payout triggers?
- What is the risk of a financial loan?
Field Insight – aggregated - delivers

*R&D, Ag Business, Market Insight*

July 20, 2017

Last 30 day
P/PET

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Two areas to ‘watch’ as drought conditions are building
Predictive analytics – across the ag value chain

Pest and disease models: how many acres – and where - under threat?

Irrigation demand: crop water need

Crop suitability: what crops can grow where? should? could?

Environmental trend: how is the environment changing? (ecological thresholds)

Yield and production: the bottom line
  * for food security, climate refugees
  * for commodity carry-out / supply – markets

...forecasting sales
Predictive modeling aggregated for any geography - here showing ‘sales territories’ and their variability within and between
Conditions of the corn crop globally:
insight to future market conditions...
An agriculture intelligence company

The most complete ag-weather data and insight for real-time agricultural decisions

We help feed the world, one insight at a time

For more information contact:

beaWhere@awhere.com
Base Agricultural Info

- Agricultural Earth Coverage
  - >1.5 million aWhere weather stations aWS (virtual)
- Daily Observed (10-20+ years)
  - Precipitation
  - Min/Max Temperature
  - Min/Max Relative Humidity
  - Max/Mean Wind speed
  - Solar Radiation
- Hourly Forecast
  - 8-15 days of hourly forecast (updated 4x daily)

>7 billion data points processed each day

Advanced Information and Insight

- Accumulated factors
- Pest and disease indices
- PET & Crop stress indices
- Soil moisture, net water
- Plant growth / harvest date indicators
- Crop suitability
- Yield & Production

Complete daily ag-met information every 9km

Global in coverage – yet localized & specific.
Current, Correct, Consistent, Complete
The most complete ag-weather information and insight for real-time agricultural decisions

**Capabilities**
- Big data analytics and visualizations
- Process >7b data points/day
- Agronomic modeling & field data analysis
- Bi-directional data and technology integrations to ensure 2-way information flows with farmers
- Operational support & expert advisors

**Information & Insight**
- >1.5m virtual weather stations with daily observed, historic, & forecast weather data
- Geolocated, time specific climate smart agricultural info services
- Crop suitability & risk/trend assessments
- Real-time production forecasting

We help feed the world, one insight at a time