AGRONOMIC ISSUE: Site Specific Weather Forecasts and Work Planning Tools
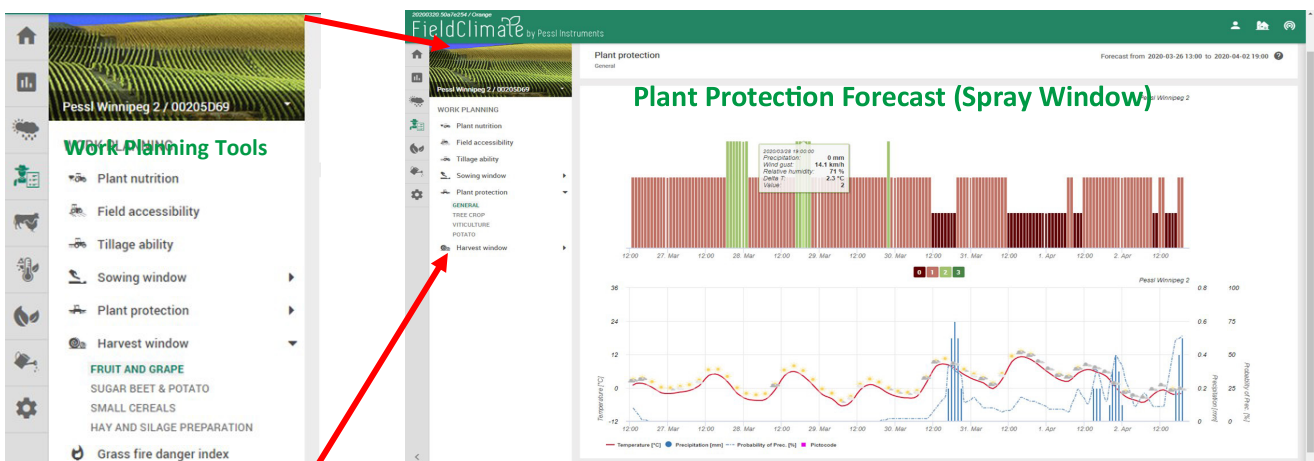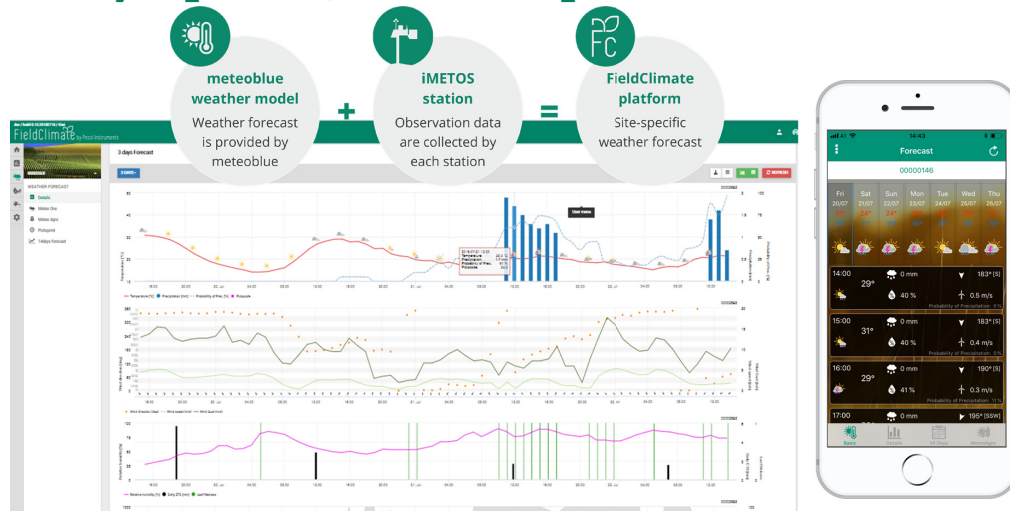
- It's always been the holy grail in agriculture to have an accurate, site specific weather forecast and work planning tools for numerous on-farm applications.

- Today, this is possible with the installation of a weather IoT device at the field, by providing data to nudge and tune the forecast based on actual field conditions and learning the climate at the field location over a period of time (AI system approach).

- This is further enhance by providing a blended multi forecast model approach (called ensemble) which is weighted and updated hourly, and reduces forecast bias.

- By using these techniques, a detailed hourly field level forecast for a number of variables is accessible: e.g. temperature, wind speed/direction and gusts, precipitation amounts and probabilities, dew point, relative humidity, leaf wetness, ETo, cloud cover, and solar radiation.

- The detailed data is then integrated into work planning tools for: plant nutrition, field accessibility, tillage ability, sowing window, plant protection (spraying), and a harvest window.

- Future enhancements will include forecasted prediction for disease models and soil moisture estimates.

IoT SOLUTION:

Site Specific Weather Station, Weather Forecast and Work Planning Tools

- Know your fields forecasted weather, by the hour, updated hourly.

- Track the probability of precipitation, amounts and types, wind speed/gust and direction, temperatures and dewpoints and a number of other variables.

- Know whey to spray based on forecasted precip amounts and timing, wind speed and direction and potential wash off periods, or add fertilizer based on additional root zone soil moisture.

LoRain Weather Station

IMT 3.3 Weather Station

Hourly Updated, Location Specific Weather Forecast

meteoblue weather model
Weather forecast is provided by meteoblue

+

iMETOS station
Observation data are collected by each station

=

FieldClimate platform
Site-specific weather forecast

Work Planning Tools

- Plant nutrition
- Field accessibility
- Tillage ability
- Sowing window
- Plant protection
- Harvest window
  - **FRUIT AND GRAPE**
  - SUGAR BEET & POTATO
  - SMALL CEREALS
  - HAY AND SILAGE PREPARATION
- Grass fire danger index

Plant Protection Forecast (Spray Window)

Cost Benefits:

We can't control the weather but we can try do everything possible to reduce the risks and become more efficient at management = Value Proposition

- The impact of weather risk on any agriculture system is substantial. Extreme weather events can reduce crop yields by as much as 50% from average yields during normal growing conditions. Weather represents roughly 70% of the uncontrollable risks a farmer faces.

- The ability to know future seeding dates and conditions based on soil temperature/moisture and forecasted precipitation events is crucial. Proper seeding temperature for emergence and germina-tion is critical for good stand development.

- Field workability in terms of access and tillage are governed by forecasted precipitation probabilities and amounts and what the historical precipitation has been for field.

- Soil fertility and when to apply is determined by soil temperature/moisture and probability of precipitation and amounts. It's well understood that each additional 25 mm or inch of soil moisture equates to so many bushels of yield for any crop. So not knowing your root zone soil moisture can result in lost yields.

- Pest and disease control or spraying is highly dependent on real-time and forecasted weather con-ditions. Know the "Windows" of when to spray based on winds, temperature, humidity, delta T and precipitation are critical for product efficacy. This can make the difference of several bushels of yield.

Grower Testimonial:

- Knowing the site specific forecasts for any field reduces my risk and increases my management efficiency.

- We spent about $4,000 on our iMetos IoT weather solution and site specific forecasting and earned money through better timing of seeding operations, work force planning, an enhanced understanding of soil nutrients via root zone soil moisture and when's the best conditions to spray for pest and disease control and efficacy. Also, the impact of highly variable weather condi-tions (climate change) is forcing us to be more proactive on our management plan.

- Our return on investment is always higher that 10:1 based on the many tools available to us.

Pessl INSTRUMENTS

METOS®