DEMONSTRATION OF DRONE TECHNOLOGIES TO IMPROVE CROP MANAGEMENT

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SITUATION

The implementation of drone technologies has shown great potential in agricultural industry, specifically in crop management for plant stress detection and its distribution. However, most growers are concerned about the costs and benefits, the manipulation, government regulations, and advantages of its application. To help local growers understand better about such technology, the affordable cost, and the advantages of its application, data processing and governmental policies, on-site demonstrations associated with a workshop were carried out to showcase the application of the cutting-edge technology.

DJI phantom 4 Pro drone with double 4k sensor

TT Aviation M6E-X2 Ag Spray Drone

OBJECTIVES

❖ At least 100 participants will be involved in the program, and 70% will have knowledge gain from the overall program.

❖ At least 30% of knowledge gain will be obtained in understanding the fundamentals about different drone systems.

❖ At least 60% will understand the advantages in application of the technologies with the knowledge increased by 30%.

❖ At least 70% are willing to change their practices by applying the drone technologies.

Flight setup with selected parameters

Demonstration of the spray drone

ACTIVITIES

❖ On-site demonstrations of the drone at three field day events and two workshops for growers and stakeholders

❖ Pre- and post tests

❖ Site and crop selection

❖ Setup for autonomous flight

❖ Flight parameter selections

❖ Operation and manipulation

❖ Government policies and guidelines (e.g., registration, certificate, authorization, and maximum height)

❖ Hardware and software for visible and invisible image collections

❖ Data processing and understanding

❖ Potential and usefulness of the data in crop management

On-site display

The drone launched

EXAMPLE OF APPLICATION

OKRA FIELD

❖ Generating "Management Zones" with software–Sentera FieldAgent, green: healthy, yellow: unhealthy, and red: missing plants or bared ground

❖ Okra dead spot detection

Management zones of okra field

Workshop to showcase the drone

RESULTS

❖ A total of 116 participants attended the events and 90 (78%) completed the pre- and post-tests.

❖ 91% (n=82) had knowledge gain with an increase of 35% in understanding the application of drone technology;

❖ 82% (n=74) believed that the application of drone technology would save their time and improve the crop management with a knowledge increase of 42%;

❖ 71% (n=64) would change their practice by implementing the drone technologies, and the knowledge was increased by 30% from the post- vs. pre-pest;

❖ 100% (n=90) believed that the various Management Zones derived from NDVI (Normalized Difference Vegetation Index) based on crop health could provide timely information for their crop management to reduce the yield loss.
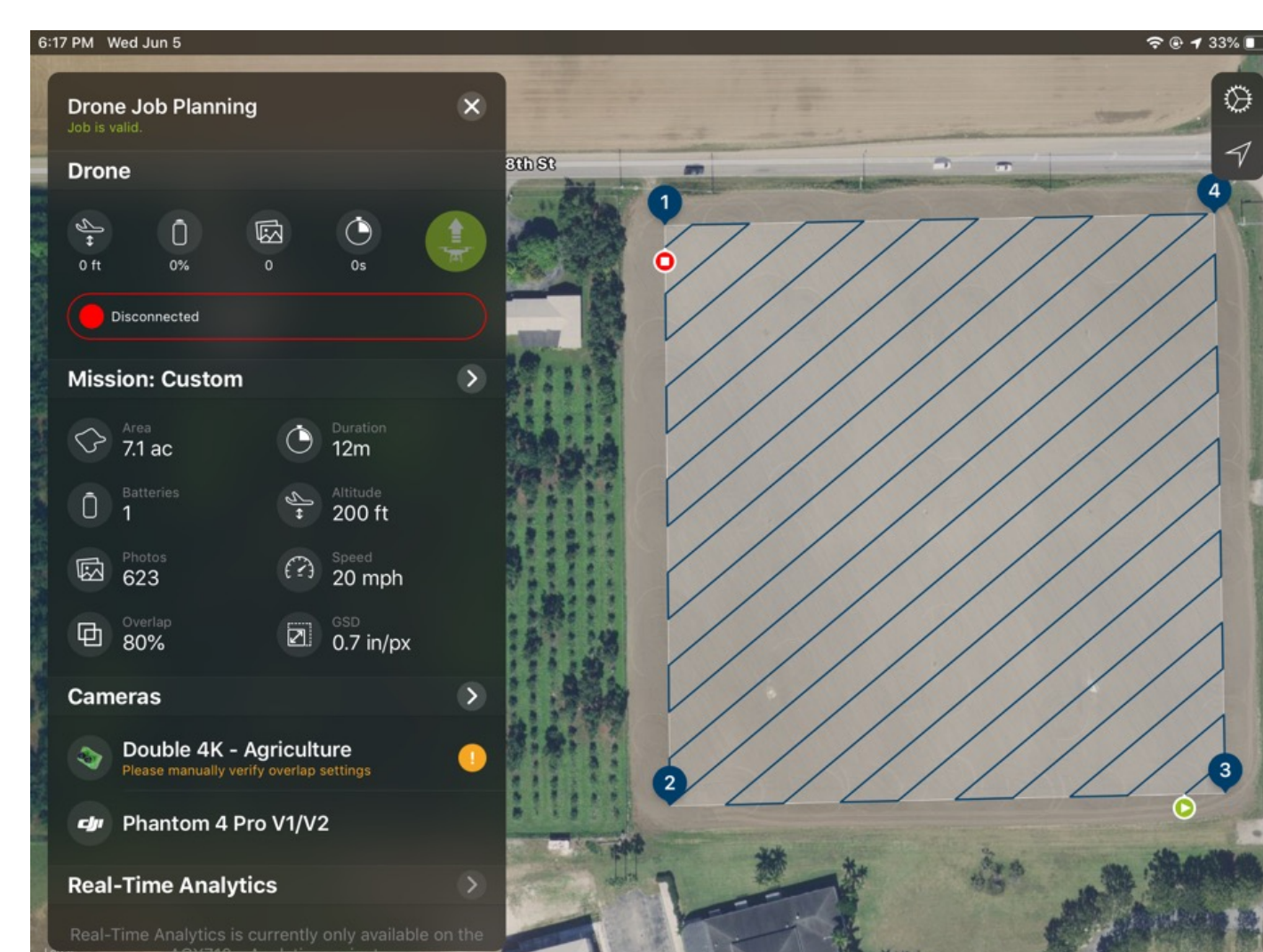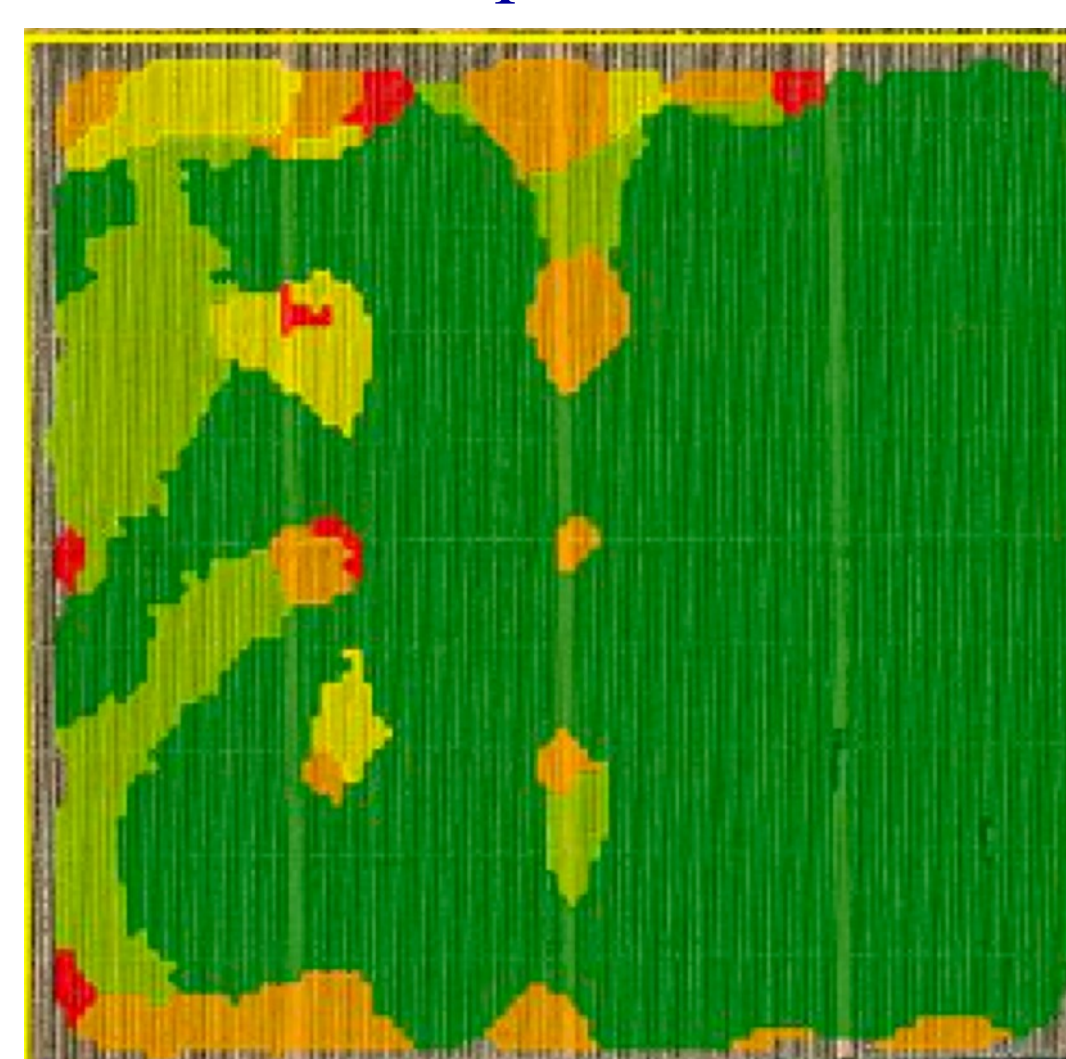

Field day demonstration

Event evaluation

IMPACTS

❖ The program has provided a platform for local growers in implementing AI with the drone technologies.

❖ A drone system with an appropriate sensor can generate informative images, which are helpful in detecting various crop stresses, such as missing plants, nutrient deficiency, and diseases.

❖ The application of drone technologies can provide real-time data for farm planning and practice changes on time to reduce the yield loss.

❖ The implementation of the technology can significantly save time and labor-costs in crop management and pest control, which can promote the crop best management for sustainable agriculture.

CONTACTS

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