Precision Agriculture Over the Rice Fields of California

Customer

Cody Thomas is a drone service provider in Sacramento, CA. His clients grow a wide variety of crops including walnuts, almonds, rice, sunflowers, and tomatoes. With field sizes ranging from 600 acres to thousands of acres, he's seen plenty of situations while flying fields. As a third-generation rice farmer, he does more than just fly fields for growers though. He truly cares about his customer and the value he can provide them.

Customer:
Highroglyph LLC
Drone Service Provider

Challenge:
Provide Watergrass Pressure Maps

Solution:
SlantRange 3P

Results:
Shapefile for helicopter pilots

Challenge

The 2018 growing season saw Cody working on improving his value to rice growers. One of the big problems growers face is watergrass, and he found a drone for that. The weed is generally controllable through herbicidal treatment, often delivered via helicopter. However, various resistant varieties make treatments complex and expensive. Growers often have to do multiple treatments of mixed herbicides.

Through the use of drone technology, Cody is able to provide precision maps showing where the watergrass is and isn't on the field. These maps are then integrated with the software used by the helicopter pilots allowing them to fly and spray only over parts of the field where watergrass is present. Due to the large cost of helicopter flight time, the savings for a grower is usually immediate.

The difficult part of this solution is getting from launching a drone to providing the helicopter pilot with a map they can use. Early in his time providing service to farmers, Cody used an RGB camera to gather data. This provided value, but he quickly realized it had limits. Without the ability to get near-infrared data he found that the data gathered wasn't helping growers act much faster than traditional methods. Sure, collecting the data was faster and easier, but it was the same data collected by walking the fields.

"It was valuable, yes, but it was leaving a lot of information out, a lot of information SlantRange is able to provide."

Solution

Stepping up to a true multi-spectral camera and associated software changed the game for Cody. A whole new world of data opened up to him. The ability to process data at the side of the field led Cody to select SlantRange when he made the move to multi-spectral imaging. The true value was the multi-spectral imaging itself though.

Even with this new level of data, there were still problems to overcome working with rice. Rice is grown in water, making a midday flyover almost useless. The reflectivity of the water overwhelms sensors. Cody learned to fly just before and after the time that's optimal for most crops. As he continued working with the system, he discovered a clever method of training the software on the subtle differences between watergrass and rice. He collected a batch of watergrass and concentrated it in a known location before flying the field. When the results came in, he was then able to tune the software based on the signature of the known good sample.

"Think of it as me being a flying hound. The drone is the platform, that's great and all, but the true value is in the data and the analytics - going out and really quantifying these areas that might have a potential issue."

Results

Despite the many challenges, ranging from long flight times due to the low altitude needed by rice to finding the right time in both the season and day to fly the season has been a success. Just as he's done with ground-based herbicide spreaders in Walnut groves, weed pressure maps created from the data acquired have been successfully loaded into the software used by helicopter pilots he works with. A dry run with the helicopter has shown success and growers are now looking forward to implementing the solution next year, saving money on expensive helicopter flight time.

At the end of the season, Cody has used his drone solutions to provide value to the growers and PCAs he works with, resulting in a positive ROI over the cost of his services. With the move to multispectral imaging a success, Cody is excited to try the SlantRange product on a new winter project this year.