Abstract: The poster outlines techniques used to extract sprayer application properties as part of a larger study. The goal of the project is to develop management recommendations for fungicidal control of Asian soybean rust. Each sprayer test produced approximately 650 samples which required a customized analysis solution for timely results. Using various image processing techniques, properties such as spectrum of droplet sizes, average droplet size, and coverage area were measured and stored into a database for further statistical analysis.

Procedure: Using Matlab, a routine was developed to streamline data acquisition from each spray card. The first step was digitizing the samples with enough resolution to distinguish objects as small as 50 µm. Each scanned image was cropped to eliminate unwanted objects such as text. The first step in isolating an object from the background is converting to a form of intensity. Some spectrums provided higher contrast ratio than others. In order to allow for changes in dye coloring, the system was designed to choose the image which produced the highest contrast ratio. From this image a threshold was computed. Anything darker than the threshold is considered an object.

Applying the threshold to the intensity image resulted in a binary image where object pixels are 1’s and background pixels are 0’s. The final step was labeling each non-connected object. This labeled image was fed into the Matlab Image Processing Toolbox which returned various properties for each object. The data was then stored into a large struct allowing the properties of any card analyzed to be looked up at a later time.

Results: Using this system, physical comparisons can be accurately made between different applications of fungicide used to control Asian soybean rust.

Future Direction: One of the future goals include seamlessly exporting data to other software such as Excel. This will allow for users who are not familiar with Matlab to combine and process the data with measurements made at the field.