Counting Apples from the Sky and Field

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Background

Advancements in geospatial imaging technology have increased efficiency and productivity in a plethora of industries and applications. In many cases, this technology has become indispensable.

Our goal is to study two emerging GIS technologies that aim to accurately predict the count and crop yield of apples.

If effective, these technologies can help growers make informed decisions

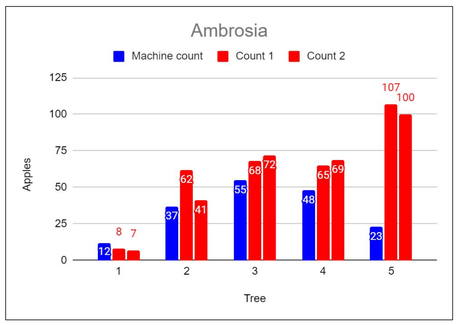
Methods

1. Selected four different varieties of apples and completed scans once every month
2. Used each technology to scan apple rows
   a. Drone (3-4min)
   b. Wide-angle camera (15-30min)
3. Conducted ground-truthing (counting by hand)
4. Compared results between ground-truthing and camera scan
5. Compared results between camera scan and drone flyover scan.

Counting Approaches

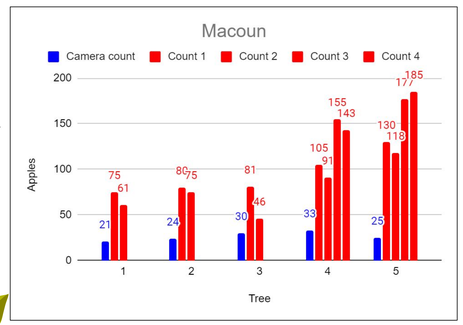
1. Overhead using drone technology
2. Between rows using a mounted, wide-angle camera lens.

Results



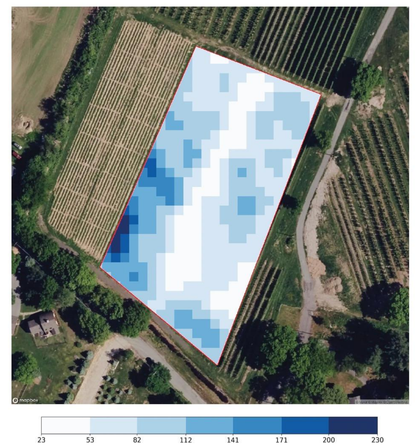
Wide-Angle

The wide-angle lens had notable discrepancies for certain varieties on a tree-by-tree basis.



Drone Results

The image depicted to the right shows the drone imaging technology, which produced a less precise but more accurate result.



Conclusion

Both technologies demonstrated some ability to accurately measure apple counts, but had their own strengths and weaknesses:

1. The wide-angle lens can give more precise results, but takes more time and can often be misleading.
2. The drone is quick, easy, and more accurate on a large scale. While it lacks the precision of the ground camera, it is less misleading.

Acknowledgements

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