Malusim App and Precision Apple Thinning – Trials and Tribulations

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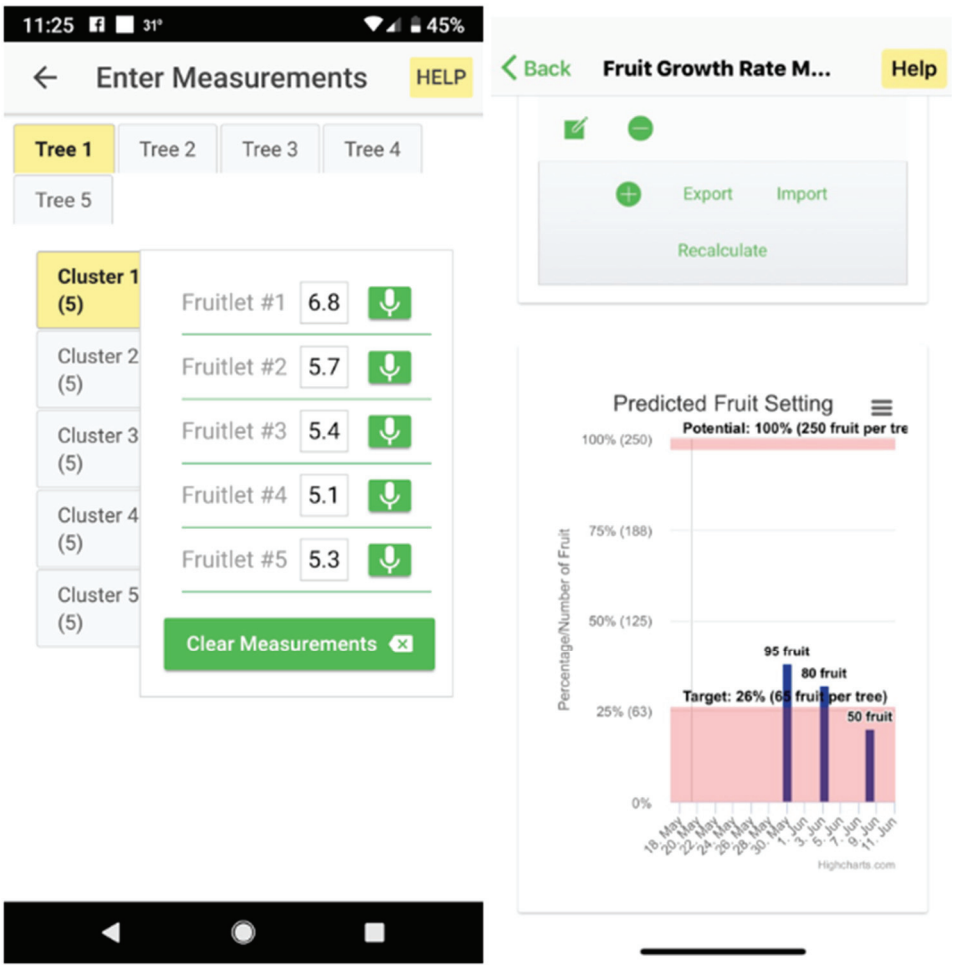
Malusim is a web and smartphone app that includes the fruitlet growth rate model, apple carbohydrate model, and an irrigation model. In 2018, the app was in beta-test mode, but in 2019, was in public release and is available on the web (malusim.org) and in the Apple iOS and Google Play stores for smartphones. The Malusim app provides both keyboard and voice input (smartphone only) for entering fruitlet growth measurements and immediately charts predicted fruit set (percent or actual numbers of fruit) of the desired final apple crop load. It has the potential to be a very handy tool to simplify the predicting-fruit-set procedure; however, further refinement of the app is necessary to achieve full potential.

Basic use of the Malusim app includes creating a location (orchard block), providing location details such as a NEWA weather station (not necessary for the fruit-growth model), variety, tree spacing, emitter spacing, etc. Before measurements for the fruit-growth-rate model can be entered, number of trees/clusters/flower clusters per tree and target fruit per tree must be specified. Then, fruit growth measurements can be entered manually or by voice input or imported or exported.

The Malusim app was used for predicting fruit set on Honeycrisp, Gala, and Fuji apple trees using voice input in the field in 2018 and 2019 at the UMass Orchard in Belchertown, MA. Instead of using the



Malusim smartphone app screen shots for entering fruit growth rate and predicting fruit set.

recommended five trees and 15 clusters per tree, only five clusters per tree were measured on five trees. All were on M.9 or B.9 rootstocks, the objective being reducing the number of measurements made, and hence speeding up the process using the Malusim app and the predicting-fruit-set model. In general, the voice input worked OK, but one had to be methodical and continually check to make sure the app was recording the measurements correctly. Using voice input makes the predicting-fruit-set procedure a one-person job vs. a two-person job when measurements have to be entered manually. (Although this can still be done.) Having immediate results of the measurements to predict fruit set was very handy vs. having to go back to the office and entering the measurements manually in a spreadsheet before visualizing the outcome of measurements.

Overall, reducing the number of clusters measured probably introduced more error/variability in the results. In the end it seems like there were more apples on the tree than what was predicted. Seems, because in 2019, a bug in the app resulted in extraneous data being introduced which is still being sorted out, hence the importance of exporting and backing up your data frequently! Still, the app has a lot of potential and only the fruitlet-growth-rate model has been touched-upon here. It is hoped that resources can be further spent on developer de-bugging and improving the Malusim app going forward.

For more detail and further information, see predicting fruitset model (https://www.canr.msu.edu/uploads/files/PredictingFruitset1-21-14.pdf) and how to use the Malusim app (predicting fruit set): http://bit.ly/2WbWZ2n.