

Champlain Valley Passive Bitter Pit Prediction for ‘Honeycrisp’

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While bitter pit can cause serious losses for ‘Honeycrisp’, there are a few tools that can help us predict the extent of bitter pit damage we might see, allowing us to make informed decisions of where to put fruit from particular blocks. One such method is the Passive Method.

Three weeks before anticipated harvest, members of the ENYCHP collected ‘Honeycrisp’ samples from 33 orchard blocks ranging from Saratoga to Clinton counties. We placed 100 apples from each block in bushel bins at room temperature for 3 weeks, and subsequently rated them for bitter pit presence. This “passive method” was developed by Chris Watkin’s lab, and can be used as a rough predictor of the percent of bitter pit one can expect coming out of storage when fruit are conditioned and stored at 38°F. The results for Northeast NY show the average incidence of bitter pit across the value is roughly 15%. That being said, there is a great deal of variation between blocks.

As our work with Dan Donahue has shown, rootstocks can make an important contribution to the percentage of bitter pit incidence in ‘Honeycrisp’. Here we see predicted bitter pit incidence separated by the rootstock of each block. Numbers above the bars represent the mean incidence of bitter pit by rootstock, while error bars show the variation between blocks we saw for each rootstock. Where bars are not present, we only had one sample of that rootstock.

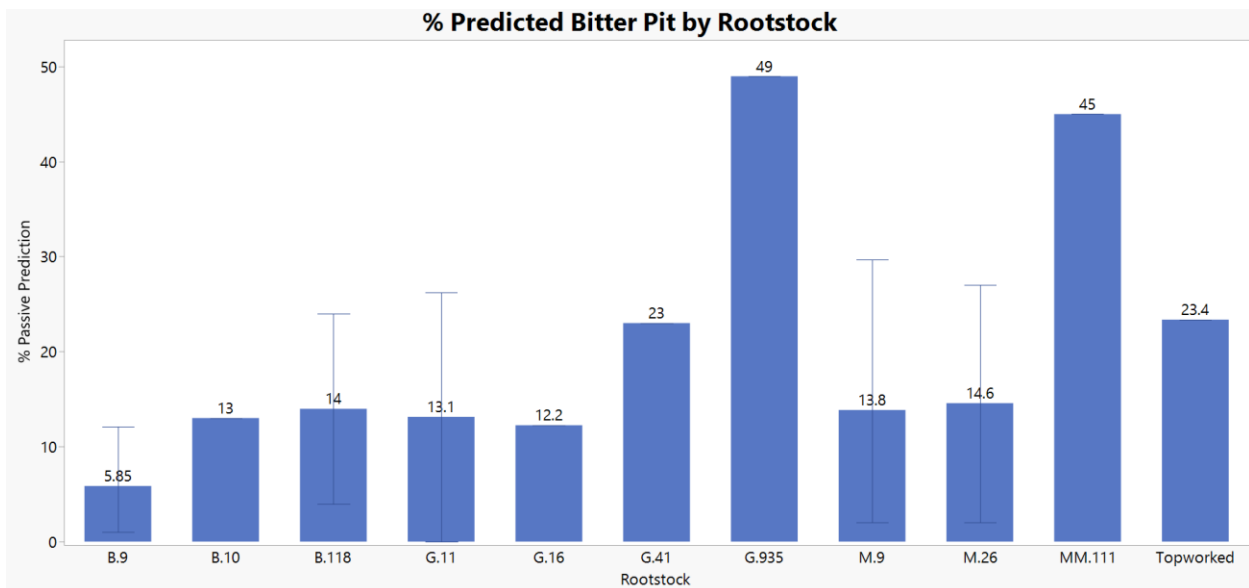


Figure 1. Percent bitter pit predicted by the passive prediction method by rootstock. Numbers above the bars represent the mean incidence of bitter pit by rootstock, while error bars show the variation between blocks we saw for each rootstock. Where bars are not present, we only had one sample of that rootstock.

In general agreement with our previous work, Bud 9 blocks around the region tended to have lower bitter pit predictions, while one MM.111 had 45% predicted bitter pit. One block of G.935 also had a high prediction of 49%, but this block is young, and we anticipate this block will likely moderate after a few more years. We also saw somewhat elevated levels in one top-worked block, and in a G.41 block. Most of the other rootstocks averaged between 10 and 15%, however the ranges show there can be a wide degree of variability even within an individual rootstock, depending on other environmental and management factors.

Given these results, we can make more informed storage decisions.

- Blocks with a low bitter pit prediction are likely good candidates for conditioning and long-term storage at 38°F. They are also good candidates for immediate marketing.
- Do not market fruit with higher than 10% bitter pit risk within the first month as it continues to develop over time, with negative effects in the marketplace (conditioning this fruit will cause rapid development of bitter pit, and is recommended to allow bitter pit to express before marketing).
- If bitter pit risk is greater than 30%, fruit can be cooled rapidly and stored at 38°F. Note that this will increase your risk of soft scald development, so take your block history and risk of scald into account when making the decision whether to skip conditioning or not. Cold temperatures preceding harvest increase the risk of soft scald in storage, so be mindful of this when choosing whether or not to skip conditioning.