Valencia fruit drop

Fruit drop: When to harvest

By Ariel Singerman and Stephen H. Futch

In the 2020–21 citrus season, fruit drop has severely impacted orange yield in Florida. According to a recent U.S. Department of Agriculture (USDA) citrus crop forecast, the estimate of fruit drop for early/mid-season and Valencia oranges was 43% and 34%, respectively.

Moreover, according to some growers, the level of fruit drop has been as high as 60% in some groves. Given that the fruit reaches higher levels of Brix when maturing on the tree, the grower faces the dilemma of whether to harvest more fruit early on or delay the harvest to achieve higher quality. The answer to such a dilemma depends on yield, price, any price premium on higher quality, harvesting cost, and, of course, the fruit drop rate.

In this article, we show the calculations for establishing in which week it would have been more profitable to harvest Valencia oranges under cumulative fruit drop scenarios ranging from 20% to 60%. Similar calculations would be applicable for early and mid-oranges.

For the calculations, we assume an average yield of 200 boxes per acre (which was the state average for 2019–20) and a price of $2 per pound solids. In addition, we assume the cost of harvesting Valencias is $3.11 per box but also include an additional harvesting cost of $0.15 per box for every 10% reduction in yield relative to 200 boxes per acre. To obtain net revenue per acre, we also subtract the Florida Department of Citrus assessment, which is $0.12 per box.

PROFITS AND DELAYED HARVEST

The weekly impact of delaying harvest on revenue (net of harvesting cost) of Valencia oranges for the scenario in which the cumulative fruit drop rate is 20% is shown by the continuous blue line in Figure 1. This figure also shows how the estimates change as the cumulative fruit drop increases by 10%, from 30% to 60%.

The findings are similar for the scenarios in which the fruit drop rate is 20% and 30%. March 1 is the optimal week for harvesting because the net revenue is highest. Starting with the week of March 8, the weekly difference for waiting one more week is negative. March 1 is also the date on which, according to data from the USDA for the last three seasons, the ratio for Valencias reaches 13. This ratio is the minimum required at most juice plants according to the Market News Bulletin published by Florida Citrus Mutual.

For fruit drop rates of 40%, 50% and 60%, the analysis shows that the sooner the harvest, the higher the revenue because the weekly difference for waiting one more week is negative starting with the second week (Feb. 22). While revenue will not be as negative as that shown in Figure 1,

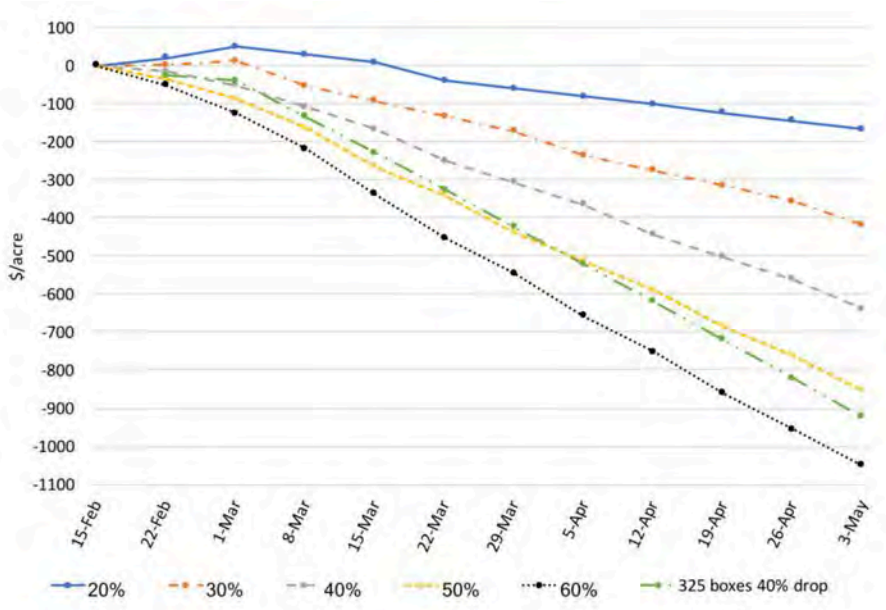

Figure 1. Weekly Impact of Delaying Harvest on Revenue (Net of Harvesting Cost) of Valencia Oranges When the Starting Yield Is 200 Boxes per Acre

if the penalty for harvesting less than 200 boxes is zero, the findings are the same regarding the optimal timing for harvesting as those indicated above. In addition, Figure 1 shows the findings are similar for a scenario in which yield starts at 325 boxes per acre instead of 200 with a fruit drop rate of 40%.

PRICE PREMIUMS

Given that we found that harvesting early is the most profitable strategy when fruit drop rates are 40% or higher, Figure 2 shows how much price should increase to offset the fruit drop by week assuming a fruit drop rate of 40%. Thus, price should end up being $2.83 the week of May 3 to offset all the fruit drop.

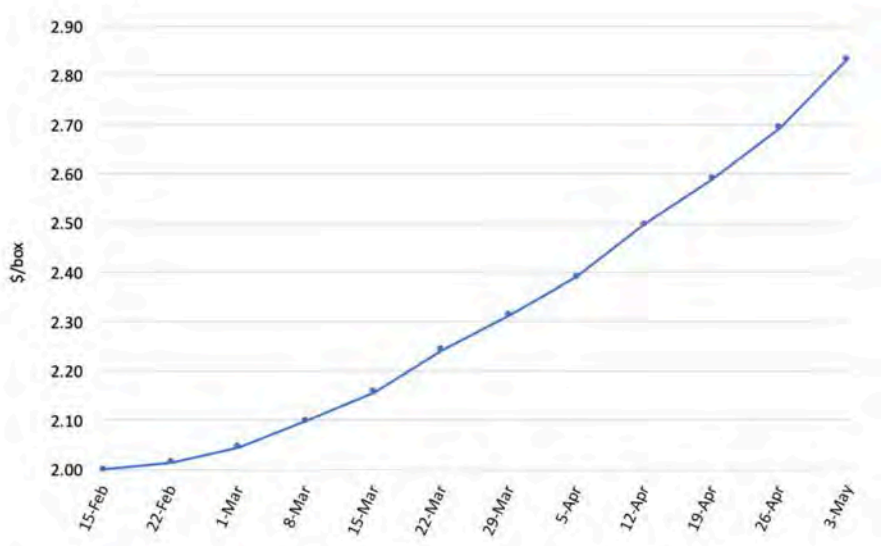

Figure 2. Weekly increase in Valencia oranges' price per box to offset a 40% fruit drop rate

SUMMARY

Our calculations showed that if the fruit drop rate for Valencias is 20% and 30%, March 1 is the optimal week for harvesting. However, if the fruit drop rate is 40% or higher, the sooner the harvest, the higher the revenue.

In addition, we also showed that prices would need to increase by approximately $0.83 per box to offset all losses due to fruit drop in a scenario in which the fruit drop is 40%. These results depend on the assumptions made and the data used. The latter includes that Valencias' quality and ratio this season follow the trends of previous seasons and reach the minimum required ratio by March 1.

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