TECHNICAL SUMMARY

Test results from the 2020/21 harvest: focus on DHA and the MPI mānuka classification

Dr Jacob Jaine, Analytica Laboratories

In this article, we compare results of freshly extracted honey from this season (2020/21) with past seasons. To do this, we selected only honey samples submitted for testing between November and May, with less than 5 mg/kg HMF, and with at least five times as much DHA as MG.

GENERAL OVERVIEW

Every year Analytica receives thousands of samples for testing. We always receive a boom of samples around summer, when flowers are in bloom, bees are collecting nectar, and clients are hard at work extracting. During this period all manner of samples are being submitted, though by carefully filtering the test results, we can focus on which samples are fresh, new season honey, and separate these from old honey samples.

This year most results were down in concentration compared to the previous (2019/20) season, though roughly in line with the 2017/18 and 2018/19 seasons. Greater variability was also seen in many markers, with some clients enjoying very high concentrations of key compounds, and some experiencing extreme lows.

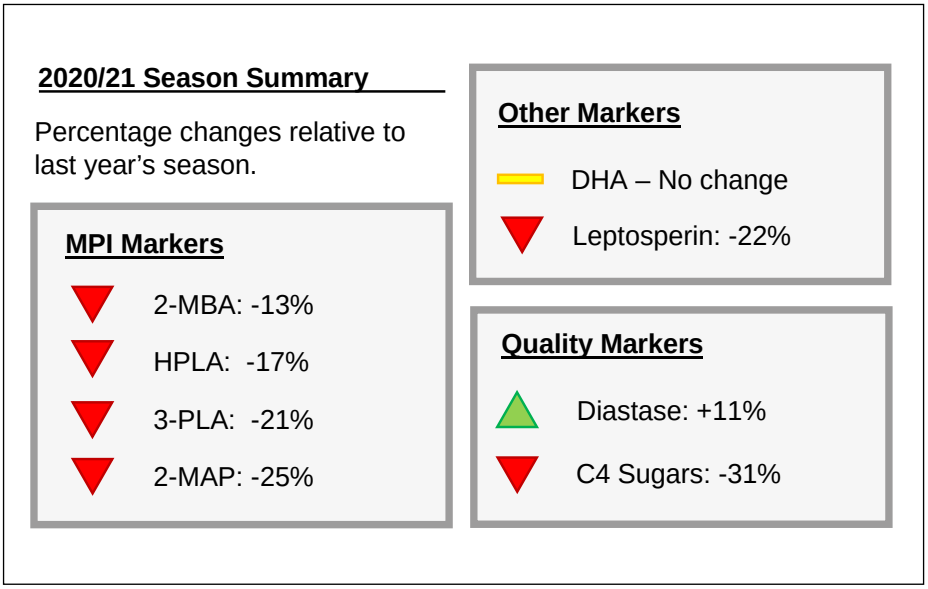

Figure 1. Summary of results for the 2020/2021 extraction season, and the corresponding percentage change in their median values compared to the previous season.

DHA

DHA (dihydroxyacetone) is one of the many natural chemicals produced in mānuka nectar (*Leptospermum scoparium*). Over time, the storage of honey results in the conversion of DHA to MG (methylglyoxal), which is largely responsible for the non-peroxide antibacterial activity (NPA) of mānuka honey.

This season, the median DHA concentration in honey was 1420 mg/kg, which is the same as the previous season. The highest DHA concentration tested was nearly 7000 mg/kg, though many samples had none. In general,

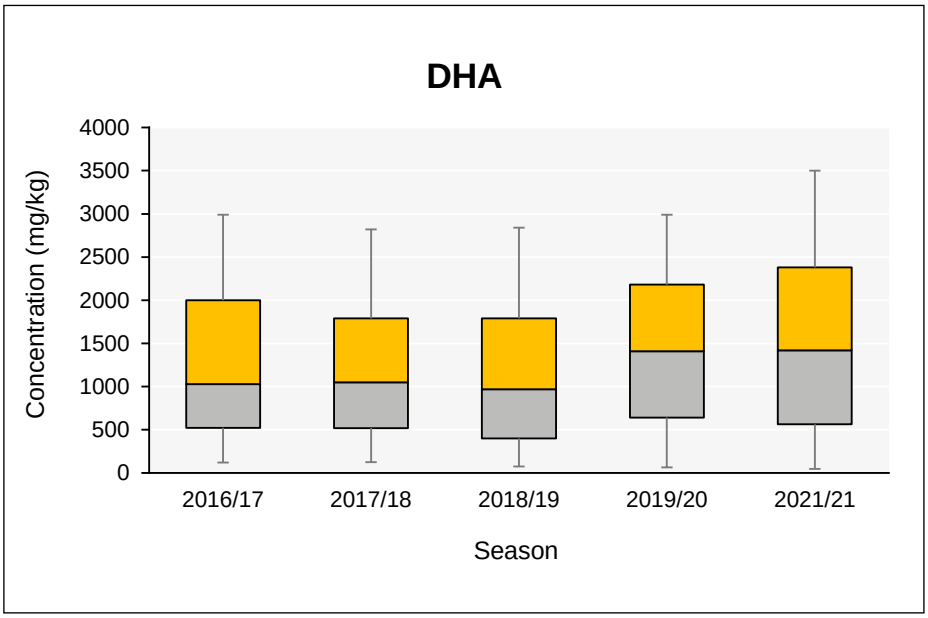

Figure 2. Box plot of DHA concentrations over the last five extraction seasons.

half of all honey samples had DHA concentrations between 563–2380 mg/kg.

MPI MĀNUKA CLASSIFICATION

Several years ago, a classification system was released by MPI for determining whether or not a honey is monofloral mānuka. It consists of four chemical markers and a DNA marker. When used in combination with a set of interpretation rules, the floral type can be determined.

This season about 70% of the freshly extracted honey samples tested for all five MPI markers were classified as monofloral mānuka. This is a lower percentage than 2019/20, and is balanced out by an increase in both multifloral and non-mānuka honey. Generally, this was because of lower chemical marker results: most were 15–25% lower than last year's season, and more in line with the 2017/2018 season.

There are always a group of samples that classify as 'not mānuka', but which do appear to contain some mānuka nectar. In freshly extracted honey, this usually arises from the test result for 2'-MAP being too low to be monofloral, or 3-PLA being too high to be multifloral. The concentration of both of these chemical markers were down this year compared to 2019/20.

By comparison, it was rare for samples to classify as 'not mānuka' only because of insufficient 2-MBA or 4-HPLA, and almost never because of insufficient mānuka DNA.

The underlying reasons for these seasonal variations are not entirely clear, and certainly not apparent to a laboratory like Analytica that is simply testing the samples received. Climatic variation can affect the production of nectar and the concentration of various compounds it contains, and continuous improvement in hive management practices should see gradual gains in the amount and quality of mānuka honey collected.

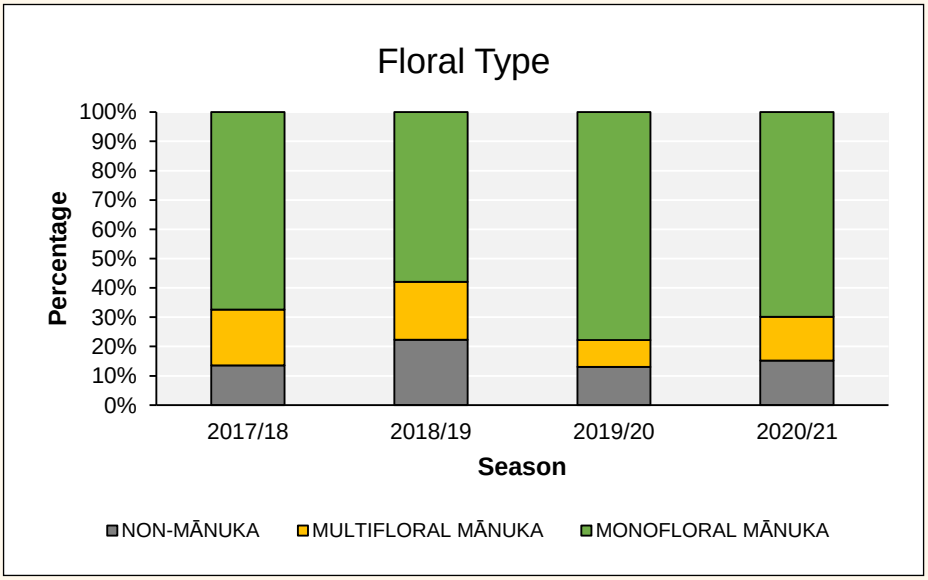

Figure 3. Box plot showing the relative proportions of fresh honey meeting each floral grade.

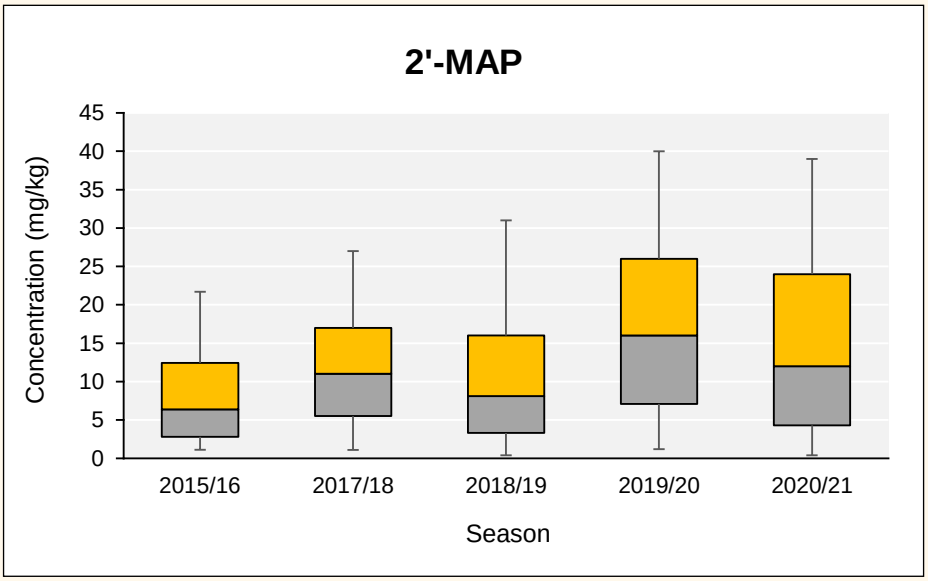

Figure 4. Box plot showing the amount of 2'-MAP in fresh honey over the past five years.

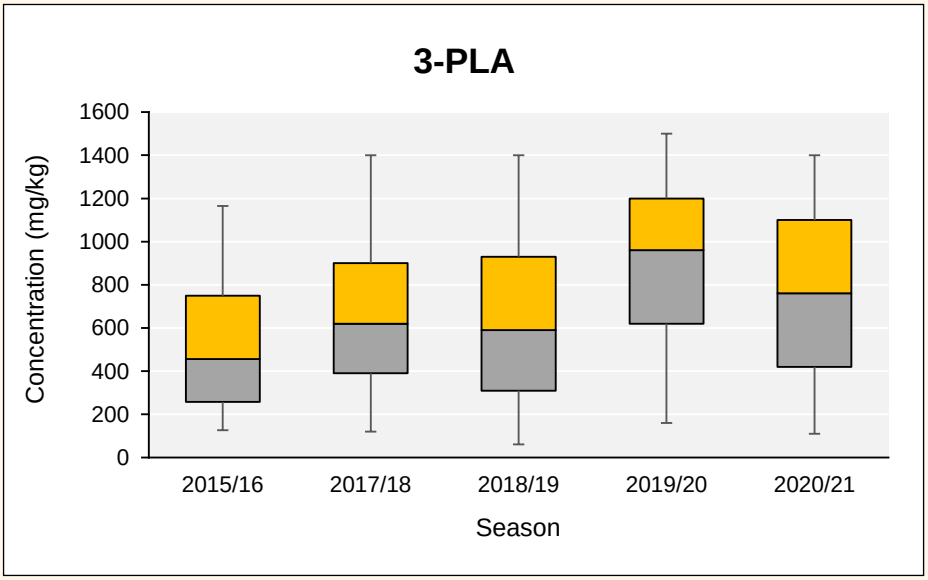

Figure 5. Box plot showing the amount of 3-PLA in fresh honey over the past five years.