

# **‘Lamb Hass’ Maturity and Fruit Quality Study**

## **Continuing Project; Year 3 of 3**

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## **Benefit to the Industry**

This project will develop the database that can be used to determine the minimum maturity standard for the ‘Lamb Hass’ cultivar. Simultaneously, we will also collect information on the comparative ripening and storage characteristics of the ‘Lamb Hass’ at various points of the commercial season. This information will help both growers and packers to develop harvesting and marketing plans for the variety. In this way, we can hopefully insure that the maximum profitability for the variety can be achieved.

## **Objectives**

- A. Assess changes in dry matter content of ‘Lamb Hass’ avocado throughout the season as compared to ‘Hass’ from varying growing conditions.
- B. Assess changes in postharvest fruit quality of ‘Lamb Hass’ avocado as the season progresses as compared to ‘Hass’ from varying growing conditions.
- C. Develop maturity release date for ‘Lamb Hass’.

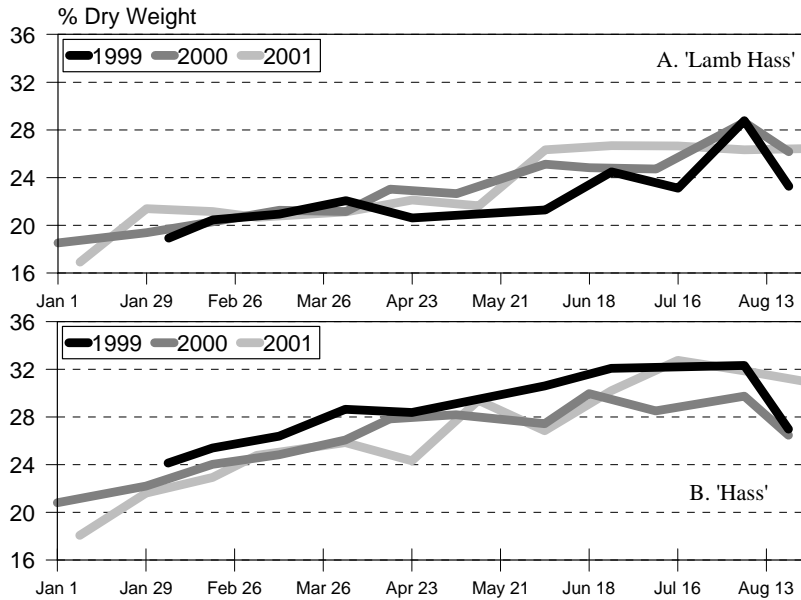
## **Summary**

We have expanded the project for this third season as described below.

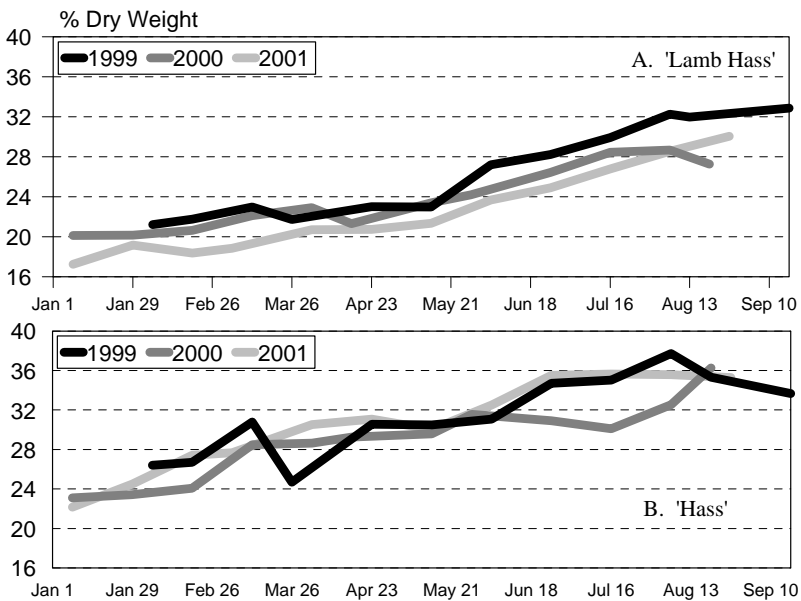
1. **Comparative sampling of ‘Lamb Hass’ and ‘Hass’.** We have continued with this activity as in past years and are using a number of the sites, which were sampled in previous years. We added an 8<sup>th</sup> site for this season (Santa Paula). Sampling commenced January 10, 2001 and ended on August 27, 2001. Samples were taken every 3 weeks. Fruit were taken to UCR where individual fruit weight, skin thickness, peel color, seed size and dry weight were measured. Figure 1 illustrates the changes in dry weight of ‘Lamb Hass’ and ‘Hass’ at the De Luz site over the 3-year study. Note that the trends are similar within a variety. Figure A-B illustrates the same data from the Somis site in Ventura County.

2. **Sampling of changes in ‘Lamb Hass’ dry weight as influenced by site and size.** We added this portion of the project this year. Ten sites from around the state were selected. Tree age varied with the site but included topworked trees and clonal trees of varying ages. Fruit were selected every 3 weeks from 2 size categories (9 – 10 oz, and 11 – 12 oz) from each site. Individual dry weight was determined on each fruit. This portion of the project commenced on January 10, 2001 and continued until August 27 for a total of 12 samplings. Samples were collected by Mr. Eric Focht from UCR and analyzed at the CDFA lab in Escondido. Figure 3 shows the data from two of the sites (Pauma Valley and Moorpark) in the study through early June, 2001. We did not consistently detect statistical differences in dry weight between the fruit sizes at each site.
3. **Sensory evaluation of ‘Lamb Hass’ and ‘Hass’.** We have modified our approach for this season. This year we eliminated the storage component of the test and decided to focus on sampling and evaluation of the fruit every 3 weeks as compared to every 6 weeks in the previous 2 years. Fruit were collected from 3 sites (De Luz, UC SCREC and Santa Paula) and taken to the UC-KAC Mitchell Postharvest Lab for evaluation. We took individual dry weight samples from 20 fruit per grower and variety. We modified the standard sampling procedure in that we took an approximately 5-gram sample at the equator portion of the fruit on opposite sides. The area was protected in subsequent ripening and once ripened, the fruit were used for sensory evaluation under the direction of Sue Collin. We instructed the panelists to taste pieces of the fruit from the mid-section of the fruit, which corresponded to the area where the dry weight sample was taken. We can then correlate the harvest dry weight of the fruit to the hedonic score (1-9) given by the panelists. We conducted preliminary tests in December 2000 and January 2001 to check methods and to insure that the fruit would ripen normally even though 5 grams of tissue had been removed. We treated the fruit with 40-ppm ethylene for 24 to 48 hours to stimulate ripening. We also treated non-sampled fruit to develop a database of comparative data in terms of “time to ripeness” and weight loss during ripening. This approach is an improvement over previous studies since we are collecting actual ratings of the fruit from which the dry weight determination has been measured. Previous studies only correlated dry weight to sensory evaluation since different fruit were used for both processes. Figure 4 shows the data that we have collected through June 18, 2001.
4. **Developing new methodology for use in dry weight determination.** In conjunction with activity (3) described above we initiated a project to evaluate the within fruit variability in terms of dry weight and to compare tissue sampling procedures. This portion of the project had two components. The first component utilized the fruit harvested in (2) above. When the fruit was tested for dry weight using the standard procedure two additional samples were taken from the equatorial portion of the fruit. We have developed a large database to compare fruit positional effects and sample preparation as related to dry weight. The second component also examined fruit positional effects and within fruit variability on dry weight. In this portion of the project we sampled fruit of different varieties during the intervening 2 weeks between sampling for parts 1, 2, and 3 described above. Five fruit from 5 to 7 varieties (‘Hass’, ‘Gwen’, ‘Lamb Hass’, ‘Fuerte’, ‘Pinkerton’, ‘GEM’ and ‘Reed’) are sampled by R. Hofshi and analyzed by D. Boreham. We divided the fruit into quarters. Each quarter was then longitudinally halved. One half (equivalent to 1/8<sup>th</sup> of the fruit) was analyzed using standard procedures. The equatorial portion of the matching section was also similarly analyzed. With the dataset we can examine positional effects on dry weight and also within fruit variability. Sampling just the equatorial portion of the fruit can potentially save labor as compared to the standard sampling procedures. We will be examining this new methodology further in the upcoming maturity season.
5. **‘Lamb Hass’ fruitlet tagging.** In Spring 2000 we tagged individual fruitlets every 3 weeks commencing in March and ending in June. This was a follow-up of the tagging project previously reported from fruitlets tagged in Spring 1999 and harvested in Spring 2000. The purpose of this project is to examine the relationship between tagging date, dry weight, and other fruit characteristics such as fruit color. The fruitlets tagged in 2000 were harvested in May 2001.

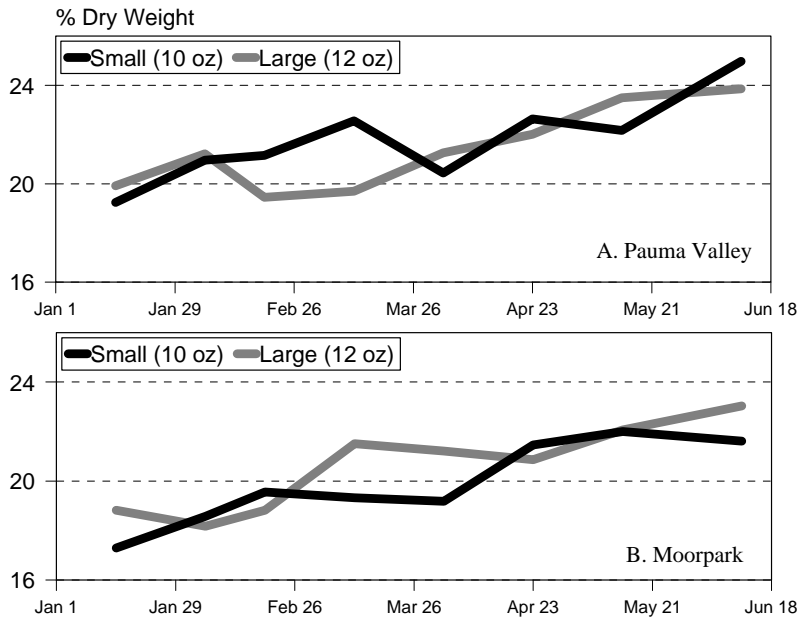
**Figure 1.** Changes in dry weight over the course of the maturity season for 3 years. (A) 'Lamb Hass' and (B) 'Hass' from the De Luz site in San Diego County.



**Figure 2.** Changes in dry weight over the course of the maturity season for 3 years. (A) 'Lamb Hass' and (B) 'Hass' from the Somis site in Ventura County.



**Figure 3.** A comparison of changes in small (10 oz.) and large (12 oz.) ‘Lamb Hass’ from Pauma Valley (A) in San Diego County and Moorpark (B) in Ventura County.



**Figure 4.** The relationship of dry weight and sensory evaluation of either ripe ‘Hass’ or ‘Lamb Hass’. Data is all sites and all harvest dates. Data collected from January 6, 2001 to June 18, 2001. A score of 1 = extremely dislike; 5 = neither like or dislike and 9 = extremely like.

