FBGA Key Project - More Analytics - Sept. 18, 2023

As part of understanding Production from our farms and how much money bamboo farmers could make, there is a general understanding that the yield and profitability reach their maximum when the farm's plants reach maturity. A question that we would like to answer is: How long should it take for a plant with good care to reach maturity?

The Key Project provides data from 4 bamboo farms by plant and by culm. The Team measures the Baseline culm Base Diameter - that is the diameter in inches at the base of each of the culms that were already in existence prior to the new season shoots.

Individual plants show their growth and maturity by the size (diameter at base) of their next season's shoots. I like to think of these as the Next Generation shoots because research indicates that plants can have more than one new generation per year or season. That being the case a plant's new culms are typically of a similar (to the other new culms) size and they reflect an increase from the prior season's culms.

Plants can be categorized by culm size 1", 2", 3" or 4" with the idea that a plant that is mature likely produces 4"-6" diameter culms. We can measure the growth increase by plant category sizes. For instance, if a plant has 1" culms what would you expect the next season's culm size to be. The thought is that possibly we could see a roadmap to maturity - how long does it take for plants with 1" culms to get to 4"?

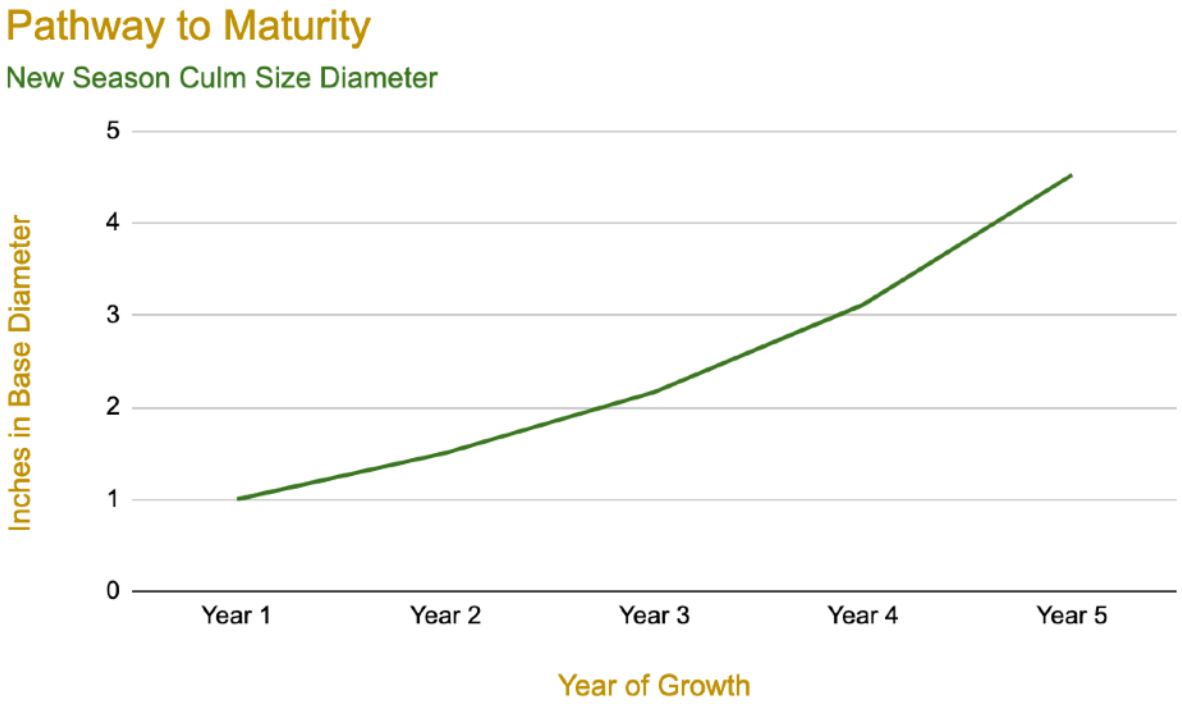
My intuitive but subjective observation was that 1 year plants get 1" culms, 2 year plants get 2" culms, 3-yr get 3" etc. Interestingly this is pretty well aligned with the facts but our data is more specific and reliable. Below are the statistics on all of the plants in the 4 farms.

How quickly are the plants maturing?

Size increase of new season shoots

Plants avg 1" culms	Plants avg 2" culms	Plants avg 3" culms
50%	44%	45%

The calculation shows that the average increase in new culm size for all of the plants with all their culms approximating 1" is 50%, and so forth. Below is a chart that applies the growth rates to a plant's culm size over time. In its 5th year it is producing culms over 4" in diameter. It is probably worth noting that in Year 4, our first year of harvest, the plants will on average produce culms that are 3" in diameter. This is based on the averages from all plants in our plots in the 4 farms.



One complexity is that we have found that not all plants grow as quickly and are not as robust. We don't understand this but i'll explain what i think is happening. First, part of this is genetics. But the variability in genetics is built into our average growth rates. I think that freezes, while not killing the plants, can create an impact by killing culms that results in a longer journey for those plants to maturity. It may be that those farms we reported on that had weaker Team Makeups (see Sep 4th email) had a large group of weaker plants due to freeze impact and those plants could become more robust with proper care.

The good news is that this data indicates that on average the plants will produce 4" culms or greater in their 5th year (or so), and that environmental impacts could lengthen this timeline.