The Sustainability of the Almond Industry

Once a rare commodity, almonds have experienced exponential supply-driven growth that is highly unsustainable in its current state. Almonds are now the most produced and consumed tree nut in the world, but the industry needs to make major changes to production and marketing techniques in order to assure its longevity. The competing interests of government, consumers, almond farmers, and neutral Californians caught in the middle makes for a complicated situation, but, if changes are not made to the techniques that are currently being employed, this highly demanded good risks having a dramatic reduction in its share of the market.

The almond industry has experienced a tremendous boom in recent years, particularly in the United States. The acreage of almond orchards in California increased over 18% from 2010 to 2014 alone, totaling 1,106,454 acres. This state accounts for 82% of the world’s current almond production, and generates revenues over $6 billion annually. By looking to the past, the size of the “almond explosion” is made even more dramatic. Satellite image analysis from the 1980s has shown that only 8% of all current almond orchards in California were in operation in the year 1984. However, this level of growth cannot continue. The recent California drought has been hard on the almond orchards, as it requires over one gallon of water to produce just one nut. It is difficult to argue that this water should go towards producing vast amounts of this crop while people are having limitations put on their personal water usage. Additional problems arise when analyzing how suitable the soil conditions of California almond orchards are for groundwater recharge. Only 60% of all almond acreage in California can sufficiently replace the
groundwater consumed by almonds. This lack of land renders irrigation a necessity for a high percentage of almond orchards.\textsuperscript{vi}

Historically, almonds existed around the southern half of the Mediterranean region, spanning parts of Spain, Italy, North Africa, the Middle East, and some small pockets of India as well. For centuries, they were only used locally and for special occasions, like the showering of newly wed Roman couples as a sign of fertility in the second century.\textsuperscript{vii} It is not until the turn of the twentieth century that the almond breeds that consumers enjoy today came into existence through genetically manipulative crossbreeding techniques. Shortly thereafter, the first almond trees were planted in California.\textsuperscript{viii}

The almond industry experienced slow growth for many decades, but it was not long before farmers in California began to notice that their soil was, \textquotedblleft especially good for growing nuts\textquotedblright.\textsuperscript{ix} Italy, Spain, and the United States all saw the potential within the almond industry, and each nation began to increase almond production in the 1960s. From 1960 to 1990, California had more than tripled its acreage of almond orchards from 100,000 acres to over 400,000 acres.\textsuperscript{x} In that time, the United States became the new top producer of almonds while only using a fraction of the acreage used by the European orchards. This was due to the California farms being built with mass production in mind, therefore streamlining their efficiency and allowing for the newest technology, such as tree-shakers for harvesting, to be used.\textsuperscript{xii}

After the \textquotedblleft almond boom\textquotedblright of the 1990s, the disparity in production between the European nations and the United States/California only grew wider.\textsuperscript{xii} Even though the production technology of the European orchards had begun to catch up with that of the Californian farms, California simply had better soil,\textsuperscript{xii} more room for expansion, and a greater quantity of resources to allocate towards almond production; for example, the diverting of pure surface water for
irrigation purposes. Food manufacturing companies introduced and advertised new purposes for almonds at this point, as corporations were formulating novel strategies in order to best monetize this new, growing supply.

In previous centuries, almond products were lacking in versatility. They were consumed primarily on their own or in slightly innovative dishes, and were occasionally found in what were, at the time, niche goods like almond milk and almond butter. They remained a relatively localized good until their initial production increase in the early 1900s. From there, almonds would begin to find their way into new goods and dishes, marking the beginning of what would become an incredibly versatile commercialization.

It was in the period of foundational growth in California that almonds began to gain traction as a common consumer good in both the American and global marketplaces. Corporations in the United States began to market almonds as a delicious treat that everyone was eager to have. After growing success since the release of Almond Joy in 1946, the Mars candy corporation decided in the 1960s to market a new Almond Bar said to have “delicious almonds in every bite.” The new candy bar was a success, showing that almonds could become a highly marketable good due to its variety of purposes in food and widening appeal across all age groups.

From the early 1900s until the latter half of said century, the conglomerate Blue Diamond Almonds (originally founded as The California Growers Exchange) controlled nearly all almond distribution. Though they still have exclusive rights to over 3,500 almond orchards today, their success at marketing the almond in innovative ways like the Mars Almond Bar had incentivized many people to join this industry in the 1970s. However, the Blue Diamond group was able to carry on mostly unimpeded until the 1990s due to almond trees requiring five to twelve years of
growth before producing fruit. One popular company today that had this track was Silk. Though they were founded under the name WhiteWave Foods in 1978, they did not release their first product, Silk almond milk, until 1996 at a California health foods expo.\textsuperscript{xviii} The decision to release their good at a trendy, health-oriented convention would go on to shape the future of the almond industry. Today almonds are marketed almost exclusively as a health good, and are even used in non-food items like “all-natural” face creams.

Some more almond products that have recently come into the fray that under the categorization of a health good are almond flour, almond yogurt, and almond tea. These goods are just a few of over a thousand new almond products that have been created in recent years.\textsuperscript{xix} Corporations have found consumers are overwhelmingly interested in any and all goods produced with almonds, which is likely due to the successful “fashion strategy”\textsuperscript{xx} of marketing used in the 1990s. By using the celebrity endorsements of models to exclaim how they were incredibly thankful for almonds,\textsuperscript{xxi} the almond industry had established its various products as the food of choice for healthy, beautiful people. This marketing technique sparked the overwhelming demand for almonds seen today and prompted the statewide burst of almond production in California over the past two decades.

Though driven by immense demand today, the innovation seen in the almond industry is due in large part to an over-supply of almonds in the early stages of the boom. The growth of almonds from the early 1900s through the 1960s was in accordance with demand. However, the production growth from the 1960s to the 1980s, California’s initial boom, was excessive to the level of demand at the time.\textsuperscript{xxii} This is reflected in the stagnation of production growth throughout the 1980s, as acreage only increased from roughly 380,000 acres to 400,000 acres. Ultimately, this trend would be turned around at the end of the decade due to the beginning of
Blue Diamond’s fashion marketing strategy working in combination with the innovations of various up-and-coming groups like Silk. The industry would then go on to attain the level of growth seen today, creating a few unique interest groups, some of which are vehemently opposed to each other.

The consumers of almonds are most ideologically aligned with the farmers operating the orchards, as they both desire the good to stay on the market in its current state. In contrast, the California state government and the citizens who have been negatively impacted by the growth in almond production desire increased regulations to be imposed on this industry in order to preserve resources and allow equal access to water. Seeing as California has been prone to droughts and water shortages in recent years, and that the annual water consumption of almonds is higher the consumption of any other crop, it is unlikely that, in the foreseeable future, any significant progress will be made in regard to regulating and improving the efficiency of this industry.

Due to almonds’ high level of water demand, mass-producing them is asking a lot of any region. The San Joaquin Valley in California, where most almonds are grown, has an average annual rainfall of just eight inches, so while the soils in this region southwest of Fresno are vast and fertile, they do not receive nearly enough precipitation to be properly utilized. However, due to the water pumped from the Sacramento-San Joaquin River Delta in Northern California and the Sierra Nevada Mountains, this region managed to become a bountiful farming region in the early 20th century. This was not too much of a problem for California’s water table at the time, but as production has expanded and shifted towards more water-intensive crops like almonds, it has become increasingly taxing on the regional water cycle, as can be seen in the recent drought.
Since almonds are a tree nut, farmers must maintain the fruitless body of the tree throughout the calendar year despite the fact that almonds are only grown and harvested from the months of May to August. The maintaining of over a million acres of these tree bases demands plenty of additional water compared to seasonal crops with a fallow period. This issue works in combination with the mismatch of the San Joaquin Valley’s climate to the almond’s preferred Mediterranean climate to produce a severe antagonistic effect on the Californian water table.

The simultaneous boom of population and water-intensive agriculture in California has created a multitude of issues in relation to the water table. Neither are slowing down, and the infrastructure cannot keep up. As almond farmer Gregory Mallett expresses, “[California hasn’t] built a dam in thirty years, and our population has [nearly] doubled.” While the lacking infrastructure is certainly an issue, the larger issue at hand is that it is only a matter of time before there are simply not sufficient resources to go around. The recent drought was a glimpse into this sparse future, as farmers had to switch from using filtered, irrigated water to the local groundwater. This water has unsuitably high levels of salinity and caused damage to many crops, further supporting that this region is a poor match for agriculture. Additionally, the drought displayed that agriculture will not simply step aside in times of water scarcity.

Many citizens of California recognize that resources are disappearing quickly and the state government sees that major regulation reformation is needed in order to maintain the states sustainability and assure their valuable agriculture’s longevity. However, consumers do not want to give up their almonds and the farmers are certainly reluctant to reduce their margins or take time out of their already busy days to learn new practices. The existing animosity is not helped by the Almond Board of California’s downplaying of the issues at hand. Though they
acknowledge the many problems in their yearly Sustainability Program brochure and even offer solutions to them, there is no mention of education and implementation measures being put into place. This behavior has served to worsen an existing sense of hostility between the farmers and the government. Due to a lack of education and training in regard to new regulations, the many farmers feel government intervention only worsens the situation, and even go so far as to say the regulations make the practice less sustainable. No individual group is to blame for this miscommunication, but they will all be required to strategize as one when agricultural production inevitably overreaches its environmental limitations.

Consumers have fallen into a situation where a product that was previously a very rare and localized luxury, the almond, is now both supplied and demanded at monumental levels in a region that is unrecognizable in comparison to its origin. Barring extreme technological advancements in agriculture in the immediate future, an extreme supply shock will be created when resources are fully expended, meaning the various stakeholders will have to agree on a course of action to take. California will have to overhaul its system of Riparian Water Rights, a law stating that any California landowner can divert any surface or ground water that flows through their property, in order to assure citizens have access to water before farmers of non-essential crops.

Almond farmers will certainly have to downsize production due to water restrictions, but the demand for their product will not disappear overnight. The best course of action would be for them to adopt a “luxury strategy” of marketing as described by Bastien and Kapferer in *Marketing Anti-Laws* and begin producing and selling almonds in a manner similar to the industry’s pre-twentieth century boom. By leveraging on the “intangible elements of singularity (time, heritage, country of origin, craftsmanship…)” and selling the almond as a luxury
good, the industry could grow the highest quality almonds in a highly sustainable manner and sell them to a small client base with a high willingness to pay for their product. The almond was previously operating under more of a fashion strategy due to the almond’s categorization as trendy health food. However, if the industry both downscales and relocates production to a region with a more appropriate climate type, this transition of marketing strategy should be attainable and would allow for farmers in the San Joaquin Valley region to transition to less water-intensive forms of agriculture.

While it may not be a product born from demand, the almond has undoubtedly established a strong presence in the preferences of consumers today. The many conflicting interests surrounding the sustainability of the almond industry lead to a complex and dynamic environment for the consumers, legislators, and farmers, but they will be forced to come to a decision sooner rather than later. Fortunately, there are a few different paths for the almond industry to take, so long as they act quickly. Although it is currently troubled, the almond has the potential to remain in the market for many years to come.

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ii Gregory Mallett. Email Interview with Gregory Mallett. April 23, 2017.


viii Ibidem


x Juan Ramon Murua, Hoy F. Carman, and Julian M. Alston. “With fewer acres, more mechanization: California leads Spain in almond production, exports to world” *California Agriculture*, Volume 47, (November 01, 1993).

xi Ibidem


Ibidem


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