



# What's Growing On?



**Raising Awareness of Florida's Declining Citrus  
Industry and Its Economic Impact**

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# What's Growing On?

## Raising Awareness of Florida's Declining Citrus Industry and Its Economic Impact

Submitted in Partial Fulfillment of the Requirements for the Degree of  
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*The personal, religious, philosophical, or political positions found this  
project are solely that of the student, and do not necessarily reflect the  
views or opinions of the committee or Liberty University.*

The background of the entire page is a repeating pattern of orange slices. Each slice is a simple line drawing in a light orange color, showing the segments and the outer peel. The slices are arranged in a grid-like pattern, alternating between whole circles and half-slices.

# Table of Contents

<b>Abstract</b>	<b>1-2</b>
<b>Chapter 1: Introduction</b>	<b>3-6</b>
<b>Chapter 2: Research</b>	<b>7-50</b>
<b>Chapter 3: Visual Process</b>	<b>51-66</b>
<b>Chapter 4: Final Solution</b>	<b>67-76</b>
<b>Chapter 5: Conclusion</b>	<b>77-80</b>
<b>Bibliography</b>	<b>81-82</b>



# Abstract

The adult population of Central Florida fails to understand the consequences of the decline of the citrus industry in the state of Florida resulting in lost jobs and wages, lost tax revenue, and a loss of acreage due to the increase in housing and infrastructure from the influx of people moving to Florida. The decline of the citrus industry in Florida is a large problem that not many people recognize as an issue.

With nearly 6.9 billion dollars earned for the state of Florida along with the support of approximately 33,000 jobs, the citrus industry is a major contributor to the state's economy (Cruz). With the decline of this industry, Florida and the families living there, could face huge economic challenges. Over the years, this problem has sprung from several different factors including citrus disease, inclement weather, and less available acreage due to population growth in Florida. With all of these factors, the citrus industry is struggling to stay productive and successful. Since identifying this problem, one solution that has come to mind is to raise awareness around the state of Florida. By raising awareness through design, we hope to assist in bringing back a thriving and important part of Florida's history and economy.

Most of the research done on this subject focuses on how to assist the citrus industry in a scientific sense. Few researchers have taken the approach of how to connect art and design to make the public aware of the seriousness of this situation. With the public's awareness, there may be more support both financially and scientifically to aid in the efforts to save the Florida citrus industry from its' continuous decline.



# Chapter 1

## Introduction

### *Research Problem*

This particular topic has a special place in my heart. For decades, the citrus industry has been a huge part of the economy in central Florida. As the years have gone by, especially within the last 10-15 years, the citrus industry has been on a steady decline. There has been a 50% decline since the early 2000s with citrus bearing trees declining from 107 million citrus trees on 832,000 acres of land to just 41 million citrus trees on 344,000 acres of land today. After the greening disease hit the orange groves in 2005, citrus began to decline. The groves were being sold and torn down. Housing developments were going up in their place. This is still occurring today. More and more groves are being torn down and more and more houses and apartments are being put up. This has a huge impact on the economy and food production in the state of Florida.

### *Research Question*

The adult population of Central Florida fails to understand the consequences of the decline of the citrus industry in the state of Florida resulting in lost jobs and wages, lost tax revenue, and a loss of acreage due to the increase in housing and infrastructure from the influx of people moving to Florida. The decline of the citrus industry in Florida is a large problem that not many people recognize as an issue. With nearly 6.9 billion dollars earned for the state of Florida along with the support of approximately 33,000 jobs, the citrus industry is a major contributor to the state's economy (Cruz). With this being such a rich part of Florida's history as well as one of the major economic contributors, how can we attempt to save the fate of the citrus industry?

### *Objectives*

With the decline of this industry, Florida and the families living there, could face huge economic challenges. Over the years, this problem has sprung from several different factors including citrus disease, inclement weather, and less available acreage due to population growth in Florida. With all of these factors, the citrus industry is struggling to stay productive and successful. Since identifying this problem, one solution that has come to mind is to raise awareness around the state of Florida. By raising awareness through design, I hope to assist in bringing back a thriving and important part of Florida's history and economy.

### ***Knowledge Gap***

While I do have first-hand experience in seeing the decline of the citrus industry, I am lacking some of the knowledge of the actual economic impact of the situation and what may happen if the Florida citrus industry continues its downward trend. To help bridge this gap in knowledge, further research will be conducted through articles, case studies, and visual analysis.

The research provided in this thesis will hopefully encourage individuals, as well as organizations, to become educated about the topic at hand. This will in turn allow them to continue efforts in raising awareness about the topic and potentially enable actions to be taken, either on the individual or organizational level, to help the Florida citrus industry gain traction again. Through the exploration of this topic, I would like to focus on trying to inform people of the critical impact the removal of all of the citrus groves has on our lives, both economically and physically. Through the use of brochures, typography, posters, and more, I plan to create a campaign of some sort to make people more aware of what is happening and the impact it will leave for the generations to come.

### ***Significance***

Having a thriving citrus industry is critical in the state of Florida. Not only does the citrus produced supply the whole country with juices, concentrates, and other items, it is also one of the main economic factors in the state of Florida. With a continued decline in the citrus industry, the state, along with its residents, will see an impact financially in some fashion.



# Chapter 2

## Research

### *Research Rationale*

The decline of the citrus industry has been a popular topic amongst citrus growers, agricultural persons, and Florida residents (specifically in central Florida) over the past decade. Due to the influx of people moving to Florida as well as other uncontrollable factors such as inclement weather, the available acreage for citrus continues to decrease. Loss of acreage, inclement weather, and citrus diseases are the main topics discussed amongst these individuals. While there are ways to solve citrus diseases (or at least stunt the impacts or research ways to heal the trees), a good way to spread awareness of this issue is to create some sort of visual campaign. Through the research provided below, the goal is to be able to create a campaign that ultimately helps raise awareness of the seriousness of this issue and invoke change.

### *Research Methods*

Most of the research on this topic focuses on the reasoning behind the decline of the Florida citrus industry. The main focus of the research performed in this study was on how citrus diseases, inclement weather, and loss of acreage impacts the productivity of citrus in the state of Florida. While there are ample amounts of research on the topics mentioned above, there is little to show how art and design or campaigns have been used to help this problem. The following information attempts to explain the reasonings behind the decline of the Florida citrus industry and what this information and data means for the residents of Florida. Along with this information, there is data given that shows what attempts have already been made to make some sort of change in the decline of the citrus industry.



## Summary of Findings:

### *Introduction*

The decline of the citrus industry in Florida is a large problem that many people do not recognize as an issue. With nearly 6.9 billion dollars earned for the state of Florida along with the support of approximately 33,000 jobs, the citrus industry is a major contributor to the state's economy (Cruz). With the decline of this industry, Florida and the families living there, could face huge economic challenges. Over the years, this problem has sprung from several different factors including citrus disease, inclement weather, and less available acreage due to population growth in Florida. With all of these factors, the citrus industry is struggling to stay productive and successful. For example, there were 298 million crates of citrus produced in the year 2000 while there were only 45 million crates produced in 2022. Since identifying this problem, one solution that has come to mind is to raise awareness around the state of Florida. By raising awareness, it is the hope of citrus growers to assist in bringing back a thriving and important part of Florida's history and economy.

A large portion of the problem that is being faced is that the adult population is unaware of the consequences of a decline in the citrus industry. Not only does the Florida industry impact jobs and wages, tax revenue, and developable acreage in the state, it is also a large cultural descriptor of Florida. In other words, a large part of Florida is known for oranges. When people think of Florida, they think of sunshine and oranges. It is a part of who Floridians are as a culture. This culture's roots run generations deep and to see that on a declining path should be at the forefront of the state's mind.

This literature review will be discussing the current and steady decline of the Florida citrus industry. It will begin by explaining the history of the citrus industry followed by a detailed explanation of sources that discuss the impacts of citrus diseases, inclement weather, the loss of acreage, production and post-production practices, and what that means to the population of Florida.



### *The History of the Florida Citrus Industry*

Citrus in the state of Florida has been around for centuries. Although citrus is not indigenous to Florida, it has been present in the state since the late 1400s. Originally stemming from Southeast Asia, citrus made its way to the New World. In the late 1490s, the plants made their way to America aboard one of the ships captained by Christopher Columbus (Robinson). It is said that the Indians received seeds from the Spaniard missionaries after that trip and then they began planting and cultivating citrus in America. While there was citrus growing around the southeast portions of the nation, it wasn't until after the Civil War that commercial planting took root in Florida and became successful. "The effects of the Civil War and the lack of markets and reliable transportation also stifled efforts. It was not until the mid-1870s, three centuries after the introduction of citrus to Florida, that the potential for commercially growing citrus developed" ("The Citrus Industry in Florida").

At this point, citrus became one of the most prosperous careers to have in Florida. Although it took hard work and dedication, many people were able to make a good living off of citrus if they were dedicated growers. After word spread about how prosperous and opportunistic owning groves in Florida was, many people began moving south to start their own grove and attempt to seek riches as citrus growers. Little did they know that the wealth didn't come until several years after the planting. Citrus doesn't produce fruit for the first several years after planting, so many of the folks who dropped everything for the Florida citrus dream were out of money and means. At this point in the industry, many of Florida's residents either sold their starter groves or became employed by some sort of citrus company to make ends meet until their crop became productive.



*Figure 1 - Aerial view of citrus groves - Winter Haven, FL in the 1920s*

As citrus became more and more popular, railway systems and waterway systems were being developed to ease shipping and transport of citrus across the state and country. One of the main ways that citrus was transported throughout the city of Winter Haven was by boat through what is called the Chain of Lakes. Back when citrus was booming and needed to be transported from groves to citrus packing plants to the railway system, the Chain of Lakes was created. The Chain of Lakes consists of 19 different lakes spanning the city of Winter Haven, Lake Alfred, and Auburndale. This system was created by digging canals to connect each lake. After the canals were dug, the citrus from the three cities could be boated over to the main railway hub off of Lake Ship in Winter Haven. From there, the citrus was transported across the country. This is just one example of the way that innovative transportation was created in order to transport large crops of citrus easily and efficiently.

Over its' long history, the Florida citrus industry has seen many good times and many bad times. The first major problem that occurred was the Great Freeze of the winter of 1894-1895. Production was huge for Florida at that time as they were producing nearly 5 million boxes of citrus per year, but the Great Freeze changed that. "The first freeze (December 1894) severely damaged groves throughout the citrus belt. Yet warm weather and new growth on recovering trees raised hope among growers. The second freeze (February 1895) however, had devastating effects. In less than 24 hours, the temperature dropped 62°F, killing or damaging every citrus tree in the area. Lake County alone lost 99% of its trees" ("The Citrus Industry in Florida"). After this freeze, the industry began a transition. The main hub of citrus shifted south making Orange, Lake, and Polk counties the main portion of the citrus belt. Nearly 20 years later, production had returned to what it was prior to the Great Freeze. One good thing to come out of the Great Freeze was the invention of smudge pots. After the freeze, grove owners started putting out smudge pots in the groves to help prevent the chance of freeze damage. A smudge pot is:

*A device, usually an oil container with some crude oil burning in the bottom, used in fruit orchards, especially citrus groves, to provide protection against frost. The smoke serves as a blanket to reduce heat losses due to outgoing radiation. Because of the air pollution they generate, smudge pots have been generally supplanted by other means of frost protection, such as smokeless burners using natural gas" ("Smudge pot").*

It is said that during the freezes in the 1980s, many local high schools would give their students excused absences if they stayed in the groves overnight to ensure that the smudge pots stayed lit and protected the trees from freezing. As one can see, the success of the citrus industry was a community wide effort.

After the devastation of the Great Freeze in the late 1800s, issues in the citrus business were relatively calm despite a few hurricanes. However:

*The worst disaster struck in 1929. The Mediterranean fruit fly (*Ceratitis Capitata*) was found infesting 75% of the state citrus trees. To eradicate the pest, entire groves were cut down and burned. Citrus areas were quarantined and fruit shipments were embargoed. Disaster within the state was so widespread that it disguised the effects of the nationwide great depression. The golden age for Florida and the citrus industry had ended in despair; neither would recover until World War II ("The Citrus Industry in Florida").*

The Mediterranean fruit fly was the first of many citrus diseases to infest citrus in the state of Florida. While this was a devastating pest, it was nothing like what was to come in the future with citrus canker and greening disease. Luckily, during the second World War, the Florida citrus industry became a key component to supporting our troops.



Figure 2 - A citrus worker in Plymouth, Florida grades oranges - 1942

During World War II, Florida citrus was sought out for a missing need for deployed troops. It was being seen that the troops overseas were lacking a sufficient quantity of vitamin C, so the citrus people in Florida came up with a solution to help (Rogers). It is stated that:

*When the US entered the war in 1941, the government requisitioned all processed citrus products. This guaranteed growers stable market and good prices for their fruit. Additional federal spending restored prosperity to Florida and the citrus industry. Tax incentives stimulated an increase in planting, and federal funds financed the construction of two large processing plants. During the war years, the demand for processed fruit stimulated scientific research. In 1943, a project funded by the Florida Citrus Commission led to the development of frozen concentrate. The development of concentrate signaled a new direction for the industry. It provided a convenient year-round source of orange juice and was an economical way to transport citrus products to market. (“The Citrus Industry in Florida”)*

Because of this need, Floridians rejoiced and enjoyed several more years of booming citrus production and business. After the war was over, many servicemen who trained in Florida came back to the area leading to a greater number of residents and tourism. While this was good for the state economy, it was a detriment to the citrus industry. Much of the land used to grow citrus was being sold to build commercial and residential properties.

Since the time after World War II to the present, the Florida citrus industry has continued in a gradual decline. The struggles mentioned above continue to occur. While researchers have come up with a solution for the Mediterranean Fruit Fly, there is now citrus greening to worry about. While some advancements have been made to protect groves from freezes and hurricanes, there is still inclement weather that the groves are no match for. While there are still some orange groves and available land, a majority is being sold and built for commercial or residential properties. The struggles keep continuing, and it doesn't seem to bother Florida residents anymore.

### **Citrus Diseases**

There are currently two main citrus diseases infecting Florida citrus groves: citrus canker and citrus greening. Marjorie Sun, the author of *The Mystery of Florida's Citrus Canker*, discusses the infection of citrus canker disease and how the United States might be able to better monitor the spreading of the disease by thoroughly checking imports and exports of products that relate to citrus. Canker disease seems to come in waves. Once it is found in a grove, it runs ramped, but if it is not caught in time then it can easily spread to other groves through saplings that are sold from infected groves. Sun also discusses what the effects of a new discovery of canker citrus disease on an already struggling citrus crop can have. This research is significant because it suggests that there are potential ways to prevent the spread of citrus canker if the correct efforts are made. Along with this, it also shows just how vulnerable the citrus crop can be. With this being the second wide-spread occurrence of canker within 75 years, growers and inspectors need to be aware of the problems that another bout of canker will bring to the citrus industry (Sun).



Figure 3 - Citrus canker on oranges

In another article that focuses on the same citrus canker disease, Kathryn Brown addresses a unique point of view that is often overlooked — the residents. Throughout Brown’s article, *Florida Fights to Stop Citrus Canker*, there is research done about canker and how the disease can impact local homeowners. One of the most common ways to treat citrus canker is to cut down or burn down the infected tree or grove. Brown states that “city residents, many of whom see “exposed” trees as perfectly healthy - and worth keeping - were getting angry” (Brown 2275). This information is important because it not only explains canker disease in citrus trees, but it also shows how the residents reacted to the cutting down of infected trees. The agricultural people didn’t take the time to explain canker to the residents, so they reacted poorly. This is significant because it shows where the lack of interest in the decline of this citrus industry may have started. If local residents aren’t being kept up to date and informed on the happenings of such an important part of Florida’s economy, they may lose interest in the topic altogether.

Another disease that has become very prevalent in today’s decline of the citrus industry is citrus greening. Stokstad’s *New Disease Endangers Florida’s Already-Suffering Citrus Trees* focuses on citrus greening and the effects it has caused. The article mentions that in other areas, like

China and India, citrus greening has essentially made it economically impossible to grow citrus. The United States doesn’t want to let that happen. One important theme throughout this article is support. One can see throughout the article that Florida, along with other agricultural groups in the United States, are supporting one another in hopes to find some way to solve the citrus greening problem. “The disease has devastated crops across the world, ravaged by three species of the bacterium. Trees become stunted and lose leaves. Instead of living for decades, they die after just 1 to 8 years. Their fruit can be lopsided, small, and green (hence the name), and they make vile juice” (Stokstad 523). This is significant because it shows what can happen if you let this disease win. If there are not efforts made to try and eradicate it, or come up with some sort of solution, Florida citrus will cease to exist. The consensus in this article lies in the importance of putting all efforts into learning more about the citrus greening disease in order to solve the problem and save the citrus industry not only in Florida, but all over the world.

After reading over the previously mentioned articles, Derek Farnsworth’s research is unique in that it discusses the economic impact on what a disease like citrus greening can have on Florida’s economy. In the *Potential Economic Cost and Response to Greening in Florida Citrus*, Farnsworth informs the public about the devastating effects of citrus greening, which directly affects the economy of Florida. He also discusses how the state has responded to greening and what other actions can be taken to move forward from this devastating disease. “The disease directly affects the citrus tree resulting in reduced yield and fruit quality following an initial incubation period, eventually making the tree unproductive and contributing to greater mortality” (Farnsworth 1). This is significant information because it specifically talks about the economic impacts this disease will have on the state of Florida. This includes the state’s economy as well as impacts on worker jobs and salaries. This data, as well as data in other research, shows consensus that the economic impacts of citrus greening has been and will be more and more devastating as time goes on.

To gain more insight on the impacts of citrus diseases to the Florida citrus industry, William Brangham went straight to the source — the farmers. Through his interviews with local grove owners, Brangham was able to conclude that the Florida citrus industry is in significant decline and the general public needs to be aware of the consequences of such a decline. One of the farmers puts it best when he stated:

*While several factors are to blame for this crisis, hurricanes Ian and Nicole damaged a lot of trees when they tore through Florida last year. The main issue is this blight, which is known as citrus greening disease. It's spread by tiny insects known as psyllids. While nearly impossible to see with the naked eye, their impact has been catastrophic. Pretty much all the trees in commercial groves now in Florida are infected with this disease. (Brangham)*

The research done by Brangham solidifies the significance of the citrus industry in Florida as well as the significant impact this decline has on the economy and peoples' lives. Similar to what one of the farmers said in the quote above, citrus diseases can be nearly impossible to see with the naked eye. If residents are not aware of the actual state of these otherwise healthy-looking trees, then they may not think anything of the major decline in the citrus industry and what impacts that will have on their lives.

To end this section on a relatively positive note, Steven Savage describes the comradery that is going on between scientists and grove owners to work towards a solution to the decline of the citrus industry. In his article, Savage starts by explaining the struggles that the Florida citrus industry has faced over the past two decades. He also explains some more about citrus diseases, the consequences of the decline of the citrus industry, and the future projection of the industry. One thing that makes this a more positive read is the theme of inclusion. Throughout his research,

Savage discusses the different solutions that have been created to help the citrus industry from diseases and low fruit production. Yes, “the continuing HLB pandemic will result in a record low Florida orange crop in 2022. But there is still reason to hope that a combination of grower dedication and research to develop diverse strategies will ultimately mean that consumers can continue to enjoy these flavorful and health-promoting fruit and juice options” (Savage 10).

### **Inclement Weather**

After citrus diseases, inclement weather is the next biggest threat to the Florida citrus industry. One of the most useful sources to learn more about how much damage a storm can do is found in How Historical Trends in Florida All-citrus Production Correlate with Devastating Hurricane and Freeze Events. Conclusive data is provided to show the impact a storm can have on a citrus grove. This is backed up with the damage reports of previous storms that have passed over the citrus belt. Ferrarezi states that:

*Although hazardous weather is just one of many factors that have contributed to the overall decline in citrus production in Florida, it is one of the most influential. The constraining effects of both cold air outbreaks and tropical systems are worthy of the industry's attention. (Ferrarezi 83)*

With this information, researchers are able to have some sort of scale from which to determine how they can create some sort of aid to assist in the damage done to trees during bad weather, which can potentially help the loss of trees during this kind of weather.

Ferrarezi also discusses the lasting impact that a storm or freeze may have on a particular area. When thinking about inclement weather, not only does one have to think about the first-hand damage done, but also the lasting damage and impact that it might have. This concept is best summed up by a portion of the following:

*The lives and livelihoods of people with agricultural interests in Central Florida are not only shaped by regional climatology, but also by the character of the area's recurring hazardous weather. Each year, season by season, this region endures an onslaught of lightning, severe thunderstorms (with damaging wind and hail), tornadoes, torrential rains and floods, droughts and wildfires, heat stress, cold air outbreaks and hurricanes. Individually, each of these phenomena is capable of causing serious property damage and even loss of life. Moreover, when a high-impact weather event leaves behind a substantial footprint on the landscape, long-term scarring can alter the character of the environment and nearby ecosystems, thereby reshaping local agricultural economies. (Ferrarezi 77)*

Like this quote mentions, the significant weather found in the state of Florida is a huge factor in the production outcomes of the citrus industry. Some storms leave residual effects that last years after the original occurrence of the storm, and that is what people need to be reminded of. Seeing as how the main citrus belt in Florida is located across the center of the state, it is a guarantee that the citrus groves will be exposed to extreme heat, cold air outbreaks, hurricanes, flooding rains, tornadoes, hail, and lightning. Keeping all of this in mind, researchers and residents alike should come together to brainstorm how the citrus groves can be better protected throughout these hazardous conditions.

With a guarantee that inclement weather will always be an issue, it is important for growers to come together to help one another keep their groves as well protected as possible



Figure 4 - Icicles cling to oranges in Lakeland, Florida after a hard freeze event in 2010

during bouts of bad weather. It can be seen in Scott Hussey's *Freezes, Fights, and Fancy: The Formation of Agricultural Cooperatives in the Florida Citrus Industry*, that the creation of agricultural cooperatives came to exist because of inclement weather such as freezes and hurricanes. The main point of this research is to show how people came together to ensure that their citrus crop survived a freeze. This information is important because it allows the reader to get a glimpse of how working together as a community brings good to the economy. It also shows how the Florida citrus industry developed, as well as some examples of early design for citrus boxes. Hussey's research is built on the consensus that even though the citrus industry and economy may go through trials and tribulations, if a community works together for the good of the people and the economy, they will benefit greatly.

With the weather always being a serious, and potentially devastating, factor in the rise and fall of the Florida citrus industry, it is important to obtain as much data from previous hurricanes, freezes, and droughts to be able to be prepared as possible for the next batch of inclement weather that hits the sunshine state. By doing this, there is potential to find ways to prevent as much damage as possible.

### Loss of Acreage

Over the last two decades, there has been a steady decrease in overall citrus acreage. Due to citrus diseases, hurricanes, and freezes, many grove owners have found it more economically feasible to sell their groves rather than try to replant damaged groves. This is especially prevalent in Central Florida. What was once covered as far as the eye could see with orange groves, Highway 27 is now mostly developed in residential and commercial land. The groves have been sold and buildings and houses have been built. As mentioned in Citrus Industry Magazine, “Florida’s citrus industry has been in a downward spiral for two decades, as growers have faced pressure from residential and commercial development, imports, changing drinking habits and citrus greening disease” (Florida Citrus Acres Declining). With all of these factors comes a price: sell their land to the highest bidder and wipe their hands clean of the struggles facing the citrus industry or keep fighting to produce a successful citrus crop despite all of the challenges.

### Production and Post-Production Practices

After the Great Freeze of 1894-1895, the citrus belt began a southern movement to shift to a more climate friendly environment for citrus production. One interesting theory is noted in Crist’s article The Citrus Industry in Florida. It goes into depth about the cultural aspects of citrus. For example, the article discusses what type of culture a citrus tree needed to be planted in, what specific areas met those needs, and the perks of growing citrus in a climate like Florida’s. Later in the article, Crist states that “only twenty years ago Florida groves were rapidly becoming nonproductive. Then “a spectacular improvement in cultural practices - the inclusion of small amounts of minor elements in fertilizers - helped to rejuvenate the citrus trees there, so that production in Florida alone is as large as the entire national Apple crop” (Crist 7-8). If the correct combination of climate, soil, and fertilizers can be concocted, then Florida may just have a fighting chance to boost its’ citrus production back up to what it was in the peak of the citrus industry.

Along with the topic of sustainable climates for citrus trees, another interesting topic is the logic behind capitalism. Shane Hamilton attempts to explain that the “logic of capitalism is not always straight forward” (Hamilton). Throughout this article, Hamilton discusses how and why frozen concentrated oranges were created and how that invention was able to assist in creating some sort of economic growth during bad and excess years of citrus crop. One of the main theories addressed in this article is rationalized agriculture. It focuses on the logic behind agriculture using a case study about frozen concentrated orange juice. “For Florida orange growers and juice processors, the most exciting thing about orange juice’s overnight transformation was its promise of a truly rational way of doing business” (Hamilton 559). This information is important because it helps remind the readers that there are creative ways that we can still help the Florida citrus industry recover. By creating new methods or new products related to oranges, like discussed in this case study, the Florida citrus industry could see some growth rather than a continuous decline.

In addition to the logic behind capitalism in Florida citrus, the Florida Citrus Agreement also has to be taken into consideration. H.G. Hamilton discusses the ins and outs of the Florida Citrus Agreement. This includes the history, the elements of the agreement, and how it has changed since it was created. Hamilton explains exactly what the objectives of the Florida Citrus Growers’ Clearing House Association were:

*The objectives of the Florida Citrus Growers’ Clearing House Association were: Standardizing of grade and pack, prohibit movement in interstate commerce of poor grade and sizes, regulate weekly shipments to insure an orderly time distribution, regulate shipments to suction markets to ensure an orderly place distribution, advertise, and minimum prices or a floor under prices which would at least return cost of production to efficient producers (Hamilton 1237).*

The objectives of the Florida Citrus Growers' Clearing House Association show exactly how the citrus industry in Florida was managed.

One of the most common post-production practices has to do with the marketing done on the business side of the citrus world. Although the following article is information about marketing trends in the 1940s, it can still be useful information to see how the marketing and citrus industry has changed over the course of the last several decades. Throughout this article, Hardy discusses all things dealing with marketing and the Florida citrus industry. He discusses how much fruit it produced, what it's used for, the price of the fruit, the citrus market, and much more. One of the most interesting marketing trends, that is still seen today, is the variation of prices of citrus over the years discussed in the article. It seems that the prices vary a lot based on what political events are going on in the country. Back in the day, "the citrus industry is exceeded only by tourists as a source of income for Florida" (Hardy 240). The information in this article is useful because it helps put into perspective how prosperous the Florida citrus industry was and what it can be if the right marketing campaigns are done.

Another interesting aspect of the post-production side of the citrus industry has to do with citrus marketing agreements. Agreements have been made between growers in Arizona, California, Florida, Puerto Rico, and Texas that allows for the growers to be more involved with the sales and shipment of their products. After reading A.W. McKay's article about citrus marketing agreements, the reader learns more and more about the importance of the grower's voice in the marketing and shipment of their product. One example of this is seen in an agreement between California and Florida growers, which states "there is plenty of evidence that the operation of the agreements in California and Florida last season resulted in increased returns, aggregating several million dollars, to the growers of those states" (McKay 347). This agreement allows for the growers to be more in touch with the sales of their product. Another example of this can be found in the marketing boards of several fruit companies, which "play a decisive role for the development of maritime reefer shipping" (Lennerfors 231). These types

of agreements allow for a greater return of income to the growers themselves, which helps the economy and secures the employment of many grove workers.

### ***What This Means to Floridians***

The synthesis in the previous sections all point to potential economic distress for Floridians. In other words, if the Florida citrus industry continues to get ravaged by citrus diseases like fruit flies, citrus canker, and greening disease, more and more groves will have to be destroyed and replanted (or sold). This will lower the need for laborers, which will mean less income for employees and less income for the state of Florida. If groves get destroyed by hurricanes or frozen during hard freezes, the choice will be the same for the grower: do they sell their land and cut their losses? Or do they replant and wait several years before their first tree will produce a crop that is usable? While this may not seem like a big deal to residents in major cities in Florida or to residents who have no ties to citrus, it will make a dramatic impact on the state economy if the citrus industry continues in the decline it is in right now.

Floridians, as well as any other interested parties, have a unique opportunity. They have the chance to make a difference. They have a chance to make a difference in the lives of thousands of people if they begin to learn and understand the importance of the citrus industry to the state of Florida. They have the chance to help improve the economy and they have an even better, possibly more rewarding, opportunity to save generations of citrus culture. They have a chance to preserve the memories of the citrus industry, whether that be the high or the lows. They have a chance to share the rich and interesting history of how Florida became known as the sunshine state and known for oranges. Without the help of Floridians, the citrus industry and the culture of Florida may become lost. With the information provided above, Floridians should begin to take the time to become aware of what is at stake and the unique opportunity that lies ahead. With the right campaign, this information may be just what is needed to increase awareness of what is at stake and how a difference can be made.



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### **Challenges Promote Changes**

When taking all of the previous knowledge into account, some people may wonder if anything has already been done in attempt to aid the declining citrus industry. Every January, a citrus forecast is released for the projected year. Wilton Simpson, Florida Commissioner of Agriculture, released the following statement which explains what the forecast is predicting along with some of the funding that he has been able to secure:

*“Today’s forecast is another sobering reminder that Florida’s citrus industry faces real challenges – like citrus greening, rising costs to growers and consumers due to inflation, and ongoing hurricane recovery efforts. The continued decline of Florida citrus has impacts well beyond the grove, as so many of our rural communities are interwoven with citrus production. However, I am confident that Florida will meet these challenges head on with a commonsense approach to support our state’s growers and world-renowned citrus industry.”*

*Commissioner Simpson has fought for Florida’s citrus industry long before being elected as Florida’s Commissioner of Agriculture. As Senate President, Simpson secured key investments for citrus protection and research, including fully funding the Citrus Health Response Program (CHRP) at \$13.3 million; fully funding the request for citrus greening research at \$16 million;*

*fully funding Florida citrus marketing at \$35 million; prevented tax increases to the citrus industry through citrus supplemental funding totaling \$2 million; and investing more than \$2 million in staff, research and infrastructure for the Donaldson citrus variety, which has been described as a “beacon of hope” for the industry in its fight against citrus greening. (“Commissioner Wilton Simpson”)*

Commissioner Wilton Simpson has been fighting hard for the Florida citrus industry. Since his time in office, he has been able to secure a large amount of funding, which has allowed for substantial research to be done in efforts to fight against many of the challenges that the industry is currently facing. Although not everyone has the level of visibility that the Florida Commissioner of Agriculture does, everyone still has a voice to be heard. Taking small steps to encourage people to take the time to learn about the citrus industry and how important it is to Florida’s economy and culture is a great place to start.

Another thing that is currently being done to attempt to help the Florida citrus industry fight against citrus diseases is the use of a combination of precision agriculture and aerospace technology. In the recent years, two University of Florida start-up companies, Agriculture Intelligence and Satlantis, have come together to create a tool that allows “the state’s growers [to] more closely monitor their trees and manage problems faster” (Dagen). Since the discovery of citrus greening, canker, and black spot disease, scientists have started breeding trees that can tolerate diseases as well as trees that have a stronger resistance to cold weather.

Although this is a great start to one of the issues facing the citrus industry, these two University of Florida companies believe that tracking and monitoring these newly developed trees is key to eradicating these issues. By using artificial intelligence programs and technology, the “goal [of these two companies] is to shorten the time between data collections and analyses and, therefore, the decision loop for growers to take action to save their trees” (Dagen).

Using these new AI systems will allow growers to track mature trees, intermediate trees, newly planted trees, and gaps that have no trees. After mapping that initial part of a grove, growers will be able to mark which trees have been infected or are struggling, and will hopefully be able to contain whatever disease or problem to a single tree or area rather than letting it spread throughout an entire grove.

With the continual development of new technology along with federal funding for plant research and preventative measures, scientists are one step closer to saving the fate of the citrus groves. This, however, does not ensure that the Florida citrus industry will turn around and stop its' decline. That still lies in the hands of Floridians and others, which is why it is imperative to raise awareness of the seriousness of the decline of the Florida citrus industry.



*Figure 5 - 20 year fight against citrus greening has Florida farmers and researchers exhausted*



## Case Studies & Visual Analyses

### Case Study 1: Citrus Growers' Willingness to Pay and Perceptions of Cover Crops

This case study was started by Dr. Tara Wade. Dr. Wade is an assistant professor of Food and Resource Economics at the University of Florida Research and Education Center. With citrus being one of Florida's major economic contributor, many researchers are looking for ways to "improve growing methods for better sustainability and better returns for growers. One such method is the use of cover crops, non-cash crops that are planted to cover the soil and improve its health" (Poulin). This particular study focuses on citrus growers' willingness to pay for cover crops and their overall perception of cover crops. The study also discusses in detail what cover crops are, how they are already being used in some areas, what the outcomes have been of farms using cover crops, and how they might benefit the groves suffering from HLB or citrus greening disease.

One challenge faced during the research conducted in this case study was the drawbacks of using cover crops:

*The primary drawback with using cover crops is their initial cost which does not translate to returns in the first few seasons following their planting . . . Cover crops may promote biodiversity by attracting beneficial insects and potential predators that target harmful pests. However, they also carry the risk of becoming weeds – competing with tree crops for nutrition due to improper management. Moreover, while pollen from cover crops could divert pests from tree crops, they could also increase the pest population. Thus, effective management of cover crops is difficult. (Wade4)*

While the benefits outweigh the drawbacks, investing in cover crops is still a heavy decision to make. To see a result in cover crops, growers need to take the time to maintain the crops and need to be willing to give them a few years' time before seeing true results.

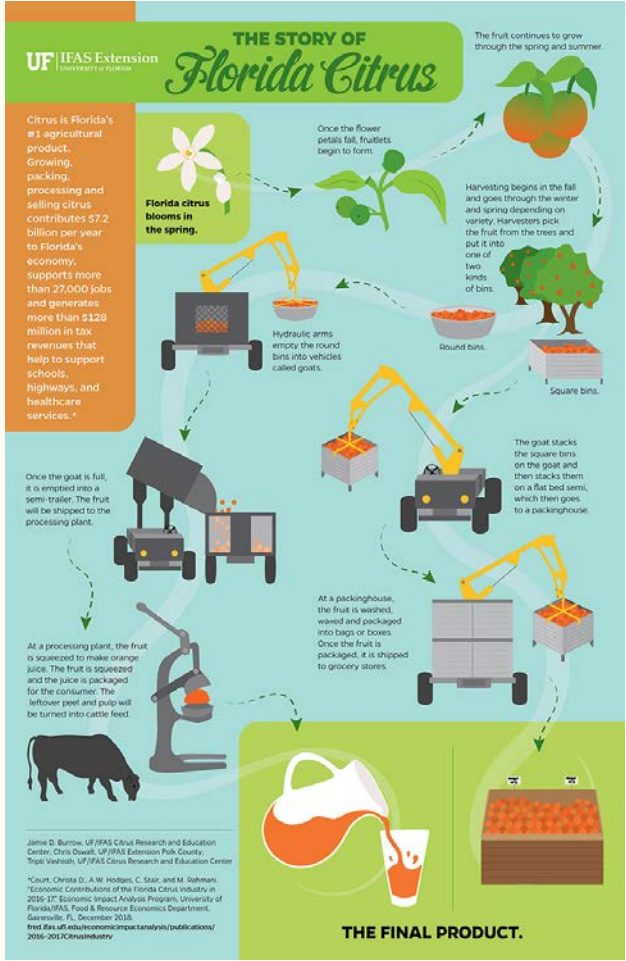
The citrus growers that received the surveys for this study were found in a variety of ways. The growers were recruited in 2021 by "Qualtrics, University of Florida Citrus Extension Agents' email list serves, cold calling groves and nurseries, the Indian River Citrus League email list serve, the California Citrus Research Board e-newsletter, and in-person interviews at the 2021 Citrus Show in Ft. Pierce, Florida" (Wade 7). Out of all of the 359 growers that completed the survey, Wade and her team were able to use 79 of the surveys for this study (59 from Florida and 20 from Texas).

After conducting surveys "to gather information on demographics, production and management practices, and perceptions on using cover crops as a conservation practice," Dr. Tara Wade has found that citrus growers' in both Florida and Texas are willing to pay for cover crops and their benefits (Wade 1). However, there are differences in the amount of money willing to be spent. It was found the growers in Florida were only willing to pay around \$500 per acre per year while growers in Texas were willing to spend around \$1000 per acre per year. Although the amount of money that growers are willing to spend on cover crops is significantly different, most all of the growers agreed on the positives of cover crops. They found that the benefit of soil nutrition was a huge positive response from the growers in Florida and Texas:

*Better soil health and growing conditions translate to healthier trees as evidence suggests, which in turn could increase yields and fruit quality. Given that the citrus industry faces several challenges, such as HLB, [this] study attempts to inform citrus growers and researchers about the incentives and disincentives for cover crop adoption and about how much growers would be willing to pay for such a conservation practice in citrus. (Wade 18)*

Overall, this case study seems to have found a relatively inexpensive and productive way to boost the health of citrus groves. This is relevant to my identified problem because it gives a great solution to everything that I have researched so far. Troubles with citrus diseases and inclement weather may both be less of an issue with the use of cover crops. While this may not necessarily solve the loss of acreage issue that is being faced, a healthier and more productive citrus grove may stop grove owners from wanting to sell their land which may potentially help with the loss of acreage situation.

**Visual Analysis 1: The Story of Florida Citrus Infographic**



The selection for this visual analysis depicts an infographic of the Florida citrus process. Author Tracy Bryant explains the flow of the infographic:

*There are two routes that Florida citrus takes, so the infographic needed to be able to visually show those two separate routes without being confusing. A transparent line behind the images and text as well as arrows were used to make a clear path for each route. The paths fork off during harvesting and each flows all the way to one of the two final products. Each step in the process is provided with text that explains details about that portion of the process. Illustrations were also included at each step in the process to represent the step as well as provide visual interest to grab the audience. (Bryant)*

While there is no particular audience being addressed for this infographic, I believe that anyone interested in the process of Florida citrus could find useful information in this image. Even younger viewers, who cannot read, would be able to follow along well with the images provided in the infographic. Through the way this infographic was laid out, people consume this visual solution by following along with the transparent path as well as with the arrows that follow along that path.

Although this infographic seems to be mainly for an educational use, I could envision it being used on a larger scale. There is a way to make small changes to this infographic so that it could be displayed near orange cases at the grocery store or in local magazines or even posted somewhere in a downtown area. For example, this could easily fit in on the wall at Grove Roots, a brewery in Winter Haven, Florida. This brewery is based on the citrus roots

that run through Winter Haven. They have beers that are made with the citrus produced there, so an infographic like the one in this visual analysis would be very beneficial to their business, and potentially the citrus industry.

Overall, the images, the form, the objects, and the accompanying text all work well together. The use of greens, oranges, and blues depict the scene of an orange grove well. The illustrations are simple, but to the point. I do think that the layout and the flow of the infographic could be worked on a bit to make the read a little bit easier on the eyes. As for the text, most of it is placed relatively well, but some of the placement needs work. Besides those minute changes, the balance throughout the image, colors, text, and form seem to work well together. The main issue I have seen while viewing this graphics is use of the arrows. The arrows seem to be a last-minute thought. They don't follow the same path as the light blight path that the illustrations are on. They seemed to have just been placed near the illustrations. I would have liked to see if the arrows could have somehow been placed on the light blue path. Maybe they could have been light blue and placed close together so it was just the head of the arrow repeating to make the path. This is a good point to bring over into my potential design solution. Overall, the aesthetic choices made in the infographic, I believe, lead to the success of this visual solution.

This visual solution has been very helpful when beginning to think of what type of visual solutions I would like to incorporate into my thesis problem. I think an infographic is very successful in this type of situation. For my thesis problem specifically, I can now see where I could potentially make a series of infographics that could help inform my problem and potentially aid in a solution if created correctly and marketed/advertised correctly.

## Case Study 2: Cost Analysis of Using Cover Crops in Citrus Production

This case study was started by Dr. Tara Wade. Dr. Wade is an assistant professor of Food and Resource Economics at the University of Florida Research and Education Center. This study goes a step beyond a previous study done by Wade and discusses whether or not using cover crops would be cost beneficial to Florida specifically. While the previous study focused on growers in Florida and Texas, this study specifically focuses on Florida growers and the benefits, if any, of using cover crops as a mean to benefit their citrus groves. This study uses Valencia oranges as a main subject to determine the success cover crops may have on soil nutrition, weed control, pest control, and an overall healthier environment for citrus trees to grow in. As Wade mentions:

*Florida has long been associated with citrus, which had a total production value of more than \$800 million in 2019. However, since the first detection of HLB or citrus greening disease in the state in Aug 2005, both the acreage and production value of citrus have declined consistently. From 2006 through 2020, total citrus acreage decreased from improve the growing conditions that benefit soil quality and contribute to tree health. Cover crops, or noncash crops, have been used by farmers, especially in row crops, to improve soil organic matter, to improve nitrogen fixing, and for weed control. Because the prevalent sandy soils of Florida are low in organic matter, citrus growers who adopt cover crops would benefit. (Wade 278)*

One challenge that was faced in this study was wide range of yields that were being recorded.

It is hard to estimate correctly the average yield of the citrus crop in Florida when the state experiences so many different bouts of inclement weather. One thing that was discussed in this study was the varying yields recorded solely based on the impact of hurricane Irma. Growers could be having or could be predicted to have a great season of growth and product, but if a storm like hurricane Irma or a freeze comes through, there is no telling what kind of damage or impact that could have on the yield of citrus.

This case study showed knowledgeable results. In the end, the research showed that citrus growers with Valencia oranges would gain from growing cover crops in their groves while those who have other varieties of oranges would not be profitable. Overall, this is relatively good news for Florida citrus growers because one of the main varieties of oranges produced in the state are Valencia oranges. Dr. Tara Wade concludes the following:

*The primary objective of a citrus grower is to maintain sustainable yield and quality as HLB continues to adversely impact the citrus industry in Florida. Cover crops provide significant benefits to tree health through their effects on soil quality. Although the benefits of cover crop adoption on fruit yield and quality are not immediate, the benefits on soil health and quality are well-documented. Therefore, cover crops would indirectly benefit citrus trees by providing improved growing conditions. Including cover crops in citrus production could be a feasible option in the long term, even though in the short term it would increase the costs of production. (Wade 285)*

Although cover crops do cost a little bit more when it comes to planting, the overall benefit seems to be worth the initial cost, especially if a growers' main citrus crop is the Valencia orange.

This information is helpful in terms of my thesis problem because it gives hope to the citrus growers of Florida. While cover crops won't solve the problem of citrus greening or other diseases, inclement weather, or the loss of acreage, it does offer some sort of solution to better nourish their crops and groves. This may potentially lead to a better yield of citrus, even amongst the citrus greening disease. This information will help inform my later topic research as well as my design decisions in that I am now planning to implement some sort of design piece that depicts the benefits of cover crops. That may be through an infographic or it may be another form of design. I do, however, think that the information from this case study is relevant and worth exploring further for my research.

### Visual Analysis 2: Cover Crops for Climate Change Adaption and Mitigation



This visual analysis selection depicts the benefits of using cover crops. Authors Savannah Bertrand, Anna Sophia Roberts, and Emma Walker state the following:

*By preventing erosion, returning organic matter to the soil, and retaining nutrients (or adding them, in the case of legumes), cover*

*crops improve soil fertility, which can increase crop yields. Cover crops also provide habitat for beneficial organisms like pollinators, which are essential for healthy agricultural environments. (Bertrand)*

The visual element of this article takes that information and puts it in a graphic form so that viewers gain a better understanding of the benefits of using cover crops. The audience for this particular piece is probably anyone in high school or older. Some of the terminology used to describe the benefits may be a bit hard to understand for people who are not familiar scientific terms like “sequester carbon”, etc.

This graphic can be consumed visually in several different ways. The viewer can look at this graphic from top to bottom or left to right and vice versa. There is no particular sequence in which the viewer needs to understand this image. The original used for this graphic was for the Environment and Energy Study Institute, but I am not sure how else this graphic was shared with the larger population.

The form, image, object, and accompanying text are related in one specific way. They are arranged to look like a dissection of the earth. The viewer can see the soil, grass, and water all of which are a part of the growing process of cover crops. As for other design aspects like the composition, semiotics, and iconography, I believe that this image could have been created much better than it was executed in the graphic above. The illustrations seem more like random clip art that was chosen and put together. I believe that if you are going to use a style, it should be used throughout the whole image, not only in certain areas. For example, the butterfly has a ton of detail while the rain and cloud have no details. Another observation is that the lavender flowers and leaves have a gradient fade to them while no other element in this design has any gradients used. I think choosing one style and sticking with it throughout the whole design would be very beneficial.

The aesthetic choices of this design, in my opinion, led to the failure of this visual solution. As mentioned above, the inconsistent design styles along with the varied visual view of the design make it unsuccessful. Along with the design aspects, the terminology makes it hard for some people to understand. If their goal was to only show this to people who are familiar with scientific terminology, then it would be successful. However, if their goal was to share this with the general public, then their goal would be unsuccessful. You have to cater to your audience and the general public, which this graphic does not do well.

If I were to use a graphic like this to assist in the solution of my thesis problem, the decline of the Florida citrus industry, I would change several things. Instead of a life cycle styled graphic, I would potentially choose to do an infographic or a design that had separate, but united, elements rather than one big scene. I would also keep the design style consistent throughout the entire design. While I do think it is beneficial to have an informational graphic like the one in this visual analysis, I believe there is a more effective way to create one, which I will attempt to create for a portion of my design solution.

### **Case Study 3: Economic Contribution of the Florida Citrus Industry**

The study of the economic contributions that the citrus industry has to the economics of Florida was initiated and conducted by Christa Court, Joao Ferreira, and Julio Cruz, all of whom work in the Food and Resource Economics Department with the University of Florida in Gainesville. The motivation behind this particular case study was to determine what kind of economic contribution the Florida citrus industry had on the states' economy for the year 2018-2019 as compared to years before.

To summarize the information in this report, the impact that the Florida citrus industry has on the economy has been on a steady decline, which continued in the years 2018-2019. A majority of the decline was seen this year from the lasting effects of hurricane Irma as well as the continued devastation from citrus greening that was found in the state of Florida back in 2005. As Christa Court mentions, "Florida citrus bearing grove area has declined from over 750,000 acres in the year 2000 to around 387,000 acres in 2019, a reduction of 48 percent, while production volume utilized has declined by 74 percent, primarily due to losses from citrus greening disease" (Court 3). There are several factors that this case study takes into account including citrus diseases, loss of acreage, inclement weather, and more.

Throughout this case study, I am not aware of any challenges that were faced other than the challenge of finding facts that prove one of Florida's largest economic contributors has continued to decline. A good way to look at this negative data is that although the citrus industry has been on a steady decline over the last several years, it is still a major contributor to the states' economy.



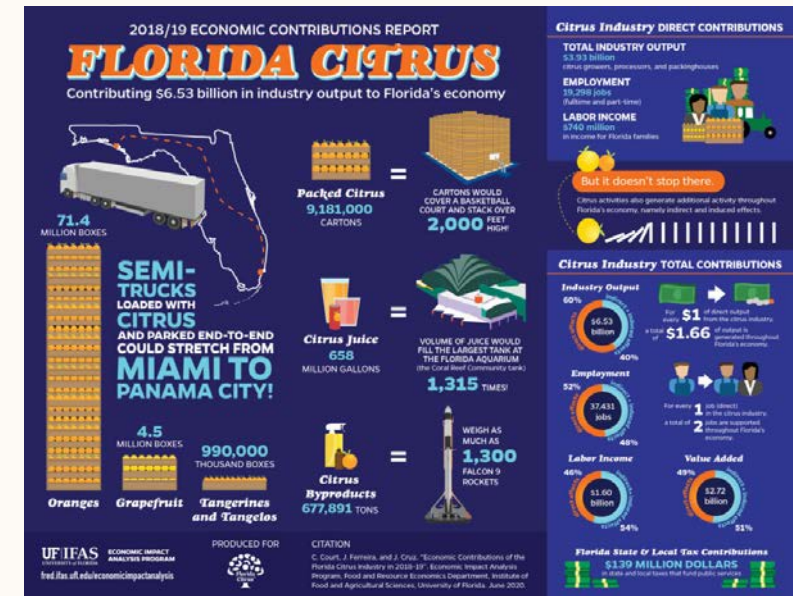
As mentioned by Christa Court, Joao Ferreira, and Julio Cruz:

*Production acreage, yields and volumes in the Florida citrus industry have generally declined over the past 19 years, due to land conversion, and the deleterious effects of citrus canker and greening (HLB) disease. However, the Florida citrus industry remains a significant contributor to Florida's economy. The economic contribution analysis estimated total industry output contributions of \$6.531 billion in 2018-19, including \$2.130 billion from citrus fruit production, \$4.327 billion from citrus juice manufacturing, and \$75 million for fresh citrus marketing. The citrus industry supported a total of 37,431 fulltime and part-time jobs in the state. Total value-added contributions, estimated at \$2.727 billion, represent the industry's contribution to Gross State Product. Labor income contributions amounted to \$1.599 billion, representing earnings by employees and business owners. Total state and local tax contributions of the Florida citrus industry were \$139 million. (Court 23)*

While one of the main economic factors of the state of Florida is having trouble, the positive outlook is that it is still contributing a significant amount to the economy. However, this doesn't mean that it will continue in that trend if nothing is done about citrus diseases, loss of acreage, or other events that impact the citrus industry.

This is relevant to my identified problem because it further explains the major contribution that the citrus industry has on the state of Florida. I believe that this information will allow readers to realize that there is no need to panic right away, but it will also show them that this is an issue that needs to be addressed sooner rather than later if we want to continue to have a thriving and impactful citrus industry in the state of Florida. With this being said, this information has helped me realize what information is important to include in the continued research on this topic, and what information might not be as helpful to include in the continued research and design of this topic.

### Visual Analysis 3: 2018/19 Economic Contributions Report – Florida Citrus



This visual analysis selection depicts different aspects that show how much the citrus industry has on the economy of Florida. This image shows not only how much and what types of citrus products were produced in the years 2018-2019, but also the citrus industry's direct contributions to labor income, employment, and total industry output.

The audience for this type of graphic, in my opinion, is an economist or someone who is interested in knowing the ins and outs of the citrus industry and how it effects Florida's economy. With the information shared on this graphic, you can learn how much of each product was made, how many people the citrus industry employed as well as how much that labor income came out to be, along with some random facts that relate to each of the aforementioned topics.

As a viewer, I would consume this visual solution in one particular way. I would expect to view this graphic from left to right, top to bottom. If I were a viewer of this graphic, I would also like to see it alongside the previous years' report so that I would be able to compare how and why the industry has changed. I would expect to see this type of image in an economic magazine, a citrus magazine, or in a

publication that discussed the state of Florida as a whole. I could also see this being in a tourist magazine or in a Florida visitors center since some of the facts are fun and relate to other attractions in Florida. By placing a graphic such as this one in a public and widely visited place, like a Florida visitors center, you would be much more likely to gain a wider audience and cultural context.

Throughout this graphic, there is a relatively solid relationship between the image, form, object, and accompanying text. The graphic is broken up nicely in two sections with each of those sections having a gridded layout. The viewer is able to follow along with the information well and is able to see which icons/graphics and text go with each other. The colors used throughout the image are consistent and reflect the industry well by using blues, oranges, and greens throughout the image. The icons used throughout the graphic are consistent with one another and seem to pair well throughout the graphic. These choices, along with other not mentioned in this visual analysis, led to the success of this visual solution. I believe that the design choices made for this graphic, along with the target audience, make for a successful visual element of the economic contributions of Florida citrus.

The aesthetic choices used in this design do relate back to my identified problem and theoretical solution in a few different ways. One way it relates back to my problem/solution is that it shows the economic contributions of the Florida citrus industry, not on the struggles it is facing. I think it is important to show not only the struggles of this industry, but also the positive points of the industry. While the industry is in trouble and does need help, it is more likely that a person would invest in an industry that is still contributing to the state's economy rather than not contributing at all, which is why it is important to show not only the struggles, but also the strong points of the citrus industry (which this graphic does). The aesthetic choice of color and layout also reflect back to my proposed solution. I plan to use a color palette similar to the one used in this graphic. I also think it is a good idea to use a layout like the one used in this graphic so that the viewer can follow along through the image without having any trouble.



## Conclusion

The Florida citrus industry is projected to have the lowest recorded production of usable citrus since the 1934-1935 season (Turner). Because of the combination of citrus diseases, inclement weather, and the loss of acreage, the state of Florida will see one of the lowest producing years in almost 100 years. “In addition to sustaining heavy damage in last fall’s Hurricane Ian, the industry has battled for two decades against deadly citrus greening disease and development pressures” (Turner 2). With the help of funds that have been granted to the Department of Agriculture and Consumer Services for the use of research and citrus protection, there is a glimmer of hope that in the near future the state of Florida will be able to have a more successfully production season of citrus.

Based on the synthesis of all of this research, it is safe to discuss the implications that are at hand if something doesn’t change soon in the current citrus industry. In their article Trends and Issues Facing the U.S. Citrus Industry, Jeff Luckstead and Stephen Devadoss state in conclusive certainty that:

*The citrus industry has been experiencing hard times as production has been declining since the mid-1990s. As a result, many have gone out of business and exited the industry. Pests and disease and weather incidences seem to threaten the livelihood of citrus growers, particularly in Florida. California growers can learn from the problems that Florida growers are experiencing to safeguard their groves. Unless significant progress is made in research and development to control diseases such as citrus canker and citrus greening and develop freeze-hardy varieties, the U.S. citrus industry will continue its downward trend in production and succumb to foreign competition. To prevent this declining trend and reverse the course of falling acreage and production, continued support for research and development, removal of abandoned citrus groves, and support for growers that have been adversely affected by citrus greening are crucial.*

*Since progress in mechanization has slowed, growers depend heavily on workers. Labor shortages and high wage rates are serious problems that increase production costs and cut into citrus growers' profits. As the number of undocumented and domestic workers in the citrus industry has sharply declined, growers now mainly rely on guest workers. Consequently, growers must adapt to worker shortages, rising wages, and the high cost of guest workers. (Luckstead 8)*

As Luckstead and Devadoss discussed, it is quite evident that not only are citrus diseases, inclement weather, and loss of citrus acreage contributing to the down fall of the citrus industry but economic inflation, labor shortages, and foreign competition are also factors that do not help the citrus industry situation.

Through the research done in this chapter, it has been concluded that there are several factors that impact the past, present, and future of the Florida citrus industry. The factors include, but are not limited to citrus diseases, inclement weather, loss of acreage, production practices, and post-production practices. The research concludes that the Florida citrus industry is in trouble both from the factors mentioned above as well as the lack of awareness in Florida residents. The Florida citrus growers and government need to continue educating

consumers about the decline of the citrus industry. Some consumers may be wondering why orange juice prices have increased so much. One of the main reasons is because of the lack of usable oranges due to the aforementioned factors. This increase in price might be just what is needed to start the process of gaining attention and awareness of the falling industry.

The reality of the citrus industry is frightening and the lack of awareness of the industry's state in Florida residents is even more alarming. As mentioned by Daniel Munch, "persistent hurricanes, ever encroaching urban development, high labor costs and regulatory uncertainty have cornered Florida citrus producers into what, at times, seems like a battle lost" (Munch). Although a marketing or design campaign may not solve all of the problems that the citrus industry is facing, it is a good place to start to begin raising awareness of the dire need for some kind of change to be implemented.

Through the research done, the case studies analyzed, and the visual analyses, there have been ideas for deliverables to be created in the next portion of the thesis process. The goal of these deliverables will be to raise awareness of the seriousness that a continued decline on the Florida citrus industry will have on the state's economy. Although the battle may seem lost, if researchers and groves owners continue putting their heads together to research better practices and maintenance of citrus and if the public becomes aware of the seriousness of this issue, then there may still be hope for one of Florida's leading economic contributors – the citrus industry.



# Chapter 3

## Visual Process

After thorough research, it was concluded that the visual solution of this thesis needed to focus on educating and raising awareness to the general population of Florida the history of the Florida citrus industry, the current state of the industry, and what effects that will have on said population. It was found that a majority of the people living in Florida are not aware of the importance or the involvement of Florida in the worldwide citrus industry. Besides those people whom have been involved in the citrus business, those who grew up in the prime of the citrus industry, or those whom are interested in state history, there are not many Florida residents who know anything about the citrus industry and the great impact it has on Florida's economy.

To successfully address the need to educate the Florida general population on the citrus industry and everything that it encompasses, an awareness campaign has been created. Through this campaign, viewers will learn more about the rich history that the Florida citrus industry has provided to Florida along with the consequences of letting the industry continue in the downward trend it is currently pursuing. The elements of design used in this campaign draw from the rich history of design and past citrus marketing materials to ensure that the design of the campaign stays true to its goal.

The campaign for this thesis ensures that through the designs, multiple demographics can be reached. Through the use of infographics, posters, stamps, stickers, and a photography series, this campaign is able to connect with a wide audience. All of these elements combined with the rich color palette, references to old "retro" designs, and usability allow for this campaign to be successful across the spectrum of the general population of Florida and beyond.

# The Plan

## *Target Audience*

The target audience for this campaign is a wide range of people. The infographics are aimed to reach adults, the posters, prints, and stickers are aimed to reach a younger demographic (teen to young adult), and the forever stamp series is targeted to reach older adults. By having specific elements that reach different age groups, it is the hope of the campaign to get its message across a wide array of viewers.

## *Infographics*

The first elements that are included in this campaign are infographics. These infographics focus on the Florida citrus industry in a few different ways. Through both designs, a consistent color palette and overall stylistic approach will be shared. Both infographics have some sort of call to action that calls the viewer to become aware of the state of the citrus industry and calls the viewer to be proactive in helping boost the industry.

The first infographic of the campaign is based on the history of the Florida citrus industry. This includes how citrus made its way to Florida, how it moved locations from northern Florida to central/southern Florida, and all of the hardships the industry has faced. The second infographic explains the benefits of an orange with a brief history of the industry. Within each of the infographics, there is a call to action encouraging viewers to take part in the preservation of the Florida citrus industry.

## *Posters, Prints, Stickers*

Another element of this campaign includes prints and posters. This will include posters, stickers, phone wallpapers, and more. The design elements used for these items were derived from old citrus crate labels. The colors, typography, and illustrative designs are reflective of those citrus crate labels. Along with this, some of the posters have iconic or historical references into the design. For example, one of the posters/stickers is of the Citrus Tower (a historical monument in Clermont, Florida). Like the infographics, the goal of these prints is to raise awareness of a once booming industry. These prints will allow for a reminder of the unique and important role that the Florida citrus industry played in the foundation of Florida as it is known today.

## *Forever Stamp Series*

The final element of this campaign is a series of forever stamps. Like the other campaign pieces, these stamps also have elements of retro designs, but the focus of these stamps is to bring recognition to the historical monuments and historical iconography that are so important to Florida citrus history, more so than the prints did. These also use the same color palette and typography used throughout the rest of the campaign. While the stamps don't have a specific call to action, a portion of all stamp purchases made will go to citrus preservation research. Through the memories of the historical landmarks and icons of the citrus industry, the campaign will reach a wide range of viewers, hopefully being able to gain traction on the idea of preserving such an important aspect of Florida.

# The Process

## *Step 1: Research*

The first step in the process of this particular thesis is research. All of the design work that goes along with this thesis has been thoroughly researched and thought out. The first step in the research process is to look up a few different questions in regards to specific designs. For example, questions such as who has done it, what was done well, and what was not done well, will all be asked before proceeding to the design portion of the thesis process.

Along with this research, each design draws inspiration from different elements of design. This includes things such as design layout, iconography, typography, color palette, and more. Through additional research, this design inspiration draws on successful elements from the time period that the current design is trying to relate to. For example, in this thesis, the goal is to implement older design styles from the peak of the Florida citrus industry. This will be done using research from design campaigns done in that time period. After that information is found, a modern approach to the design will be implemented, ensuring that all of the current designs meet the design standards of the time period.

By using these different research methods and tactics, this thesis project has been able to compose and create well suited designs. These designs not only relate the viewer to the importance of the past, but also connects them with a modern version of design. The research process plays a vital role in any and all design work, so it is imperative to set aside enough time to thoroughly research the topic of design.

## *Step 2: Sketching*

Following the research portion of the thesis, the next step is to sketch out all of the designs. The sketching process differs depending on what type of design is being made. For this thesis, a number of different sketches were completed. This includes, but is not limited to, sketches of wireframes for the infographics, different typography sketches, different iconography, etc. Through these rough sketches, two to four finalized versions of sketches were created. These finalized sketches were done in more detail and focused more on what the final design would look like rather than the ideation process. Finally, after created the finalized sketches, the digital versions of the designs are created.

## *Step 3: Digitize Designs*

After finishing up the final sketches, these are all uploaded to the computer (either Adobe Illustrator or Adobe InDesign depending on what type of product is being created). The first step in terms of digital creation is to make all of the designs in gray scale. This allows for each design to be relatively complete before experimenting with different colors. After this is complete, color is added and the designs are adjusted from there until they are complete.

The final process in the digital design creation is to submit the designs for feedback. For this thesis in particular, I submitted my designs to Canvas and to my thesis advisor. I also had the opportunity to send these designs to my former professor from undergraduate school. He was able to take a look at them and make a few suggestions. From this feedback, I then made tweaks and changes until I got to the final versions of the design.

#### **Step 4: Address Problems**

When creating the design portion of this thesis, I ran into a huge problem. My original plan for one portion of my design was to photograph what currently existed in place of the orange groves that had been torn down. I was then going to take old, black and white photographs from the peak of the citrus industry and juxtapose them into each other. The goal was to show the impact of what was happening. However, I ran into the problem of copyright issues and had to scratch the idea.

The other option I had for this, was to take photographs of the current groves, but I ran into another problem. Citrus, specifically oranges, don't ripen until sometime in November. This meant that all of the fruit was still green and blended in with the trees. Since I didn't want to procrastinate to take the photographs until later in November, which would cut the turnaround time too close with the due date of this project, I decided to scrap the idea all together.

After a lot of thought, I came up with a few different ideas to replace the photography portion of my thesis. I decided to create an additional element of print design. This was done through a stamp series. All of the stamps in the series were created with the focus being on an important monument or icon in the Florida citrus industry. This includes, but is not limited to, the Citrus Tower in Clermont, Florida and an alligator juggling oranges. The money collected from these stamps will be used to raise fundings for citrus research and preservation.

To say I expected little to no problems would be accurate. However, knowing what I know now, I think I was relatively flexible and was able to still create designs and a campaign that achieved its' goal: to raise awareness of the problems associated with the decline of the Florida citrus industry.



# Narrative of Creation

## Mood board

Mood boards are generally used to compile a collection of images, colors, typography, and icons that collectively represent the direction you would like to move toward for a design or brand. Through mood boards, a designer is able to gain insight and visual imagery that may be used as a starting point or inspiration for the creation of their design.

A mood board was created for this thesis to gain a better insight on where the brand campaign was going. This mood board allowed for a general sense of design direction to be created. Through this mood board, images, colors, typography, and marketing strategies were developed. To explain in more detail, this mood board had images of past citrus marketing material, old citrus stamps, citrus labels, citrus crates, and typography styles from the peak of the Florida citrus industry. This gave a solid direction for a specific design style and color palette to be used throughout the entire campaign.

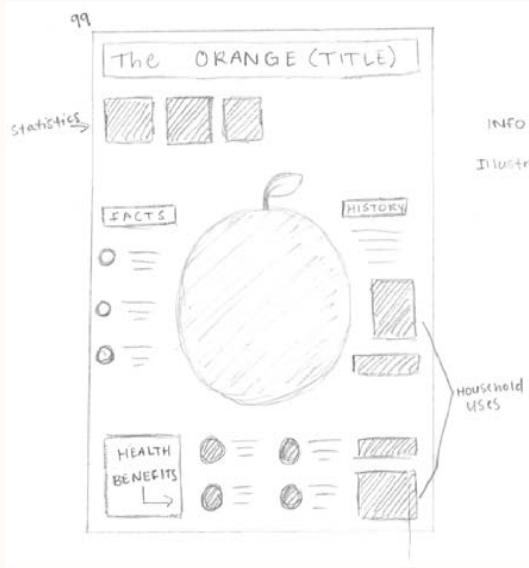
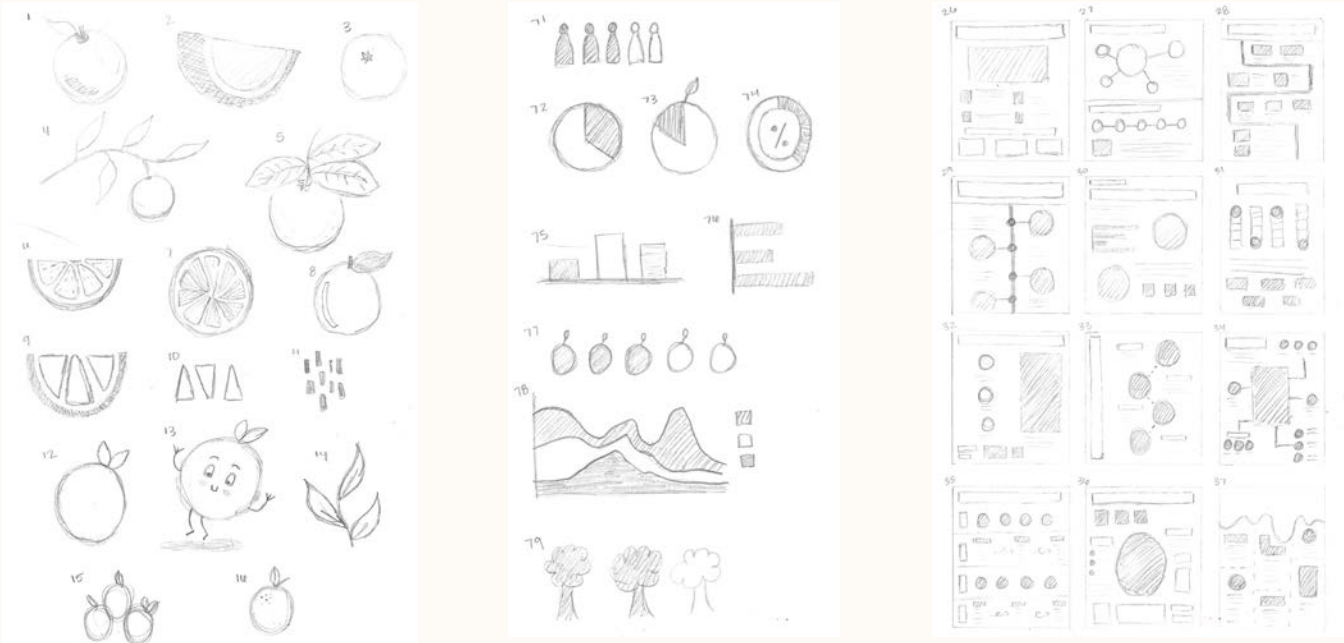


# Narrative of Creation

## Sketches

Sketches were a large and important step in the process of designing the visual solution for this thesis. Sketching was used for all aspects of the design work. There were sketches made of typography ideas, layouts and wireframes, iconography, and more. Through these sketches, several avenues were explored that ultimately led to the final design solutions shown later in this document.

Sketching allowed me to gain a better grasp and understanding on how to successfully address the issues I was trying to communicate with the viewer. In the end, the sketching process was a huge component of creating and executing the design work for the final campaign solution.



## Narrative of Creation

### Color Palette

The color palette used throughout this thesis were derived largely from the research done that included old marketing materials from the citrus industry. The colors were also drawn from an exploratory photography session in which I went out to an orange grove to take photos of textures, colors, and structures.

This campaign's color palette is made of colors you would find out in an orange grove. There are different versions of green and orange as well as a cream color and a light blue. These colors are also quintessential to the state of Florida. With Florida being known for sunshine and oranges, this color palette represents the state as well as the citrus industry.

#dff2f9

#ec5a24

#f29627

#fcf2d9

#a9cd38

#357d51

## Narrative of Creation

### Typography

When thinking of this campaign, I knew typography would be an important element to achieve the retro style that was used in the peak of the citrus industry. With that being said, I wanted to go with a thick, easy to read font. But I wanted to avoid something sterile and straight like Arial.

After considering a number of different typefaces, I ended up choosing Peacock Deep Bold for all of the headings and titles. Peacock Deep Bold is a thick, sans serif type face that has interesting markers on some of the type. These markers allow for some of the type to continue flowing rather than stopping where normal typefaces would.

The next typeface that is used throughout this campaign is Brush Script MT Italic. This type face is also a thicker, sans serif that is used for smaller headings. The reason this type was chosen for the body was because it is still thick enough to read on a larger poster without being too similar to the heading typeface, Peacock Deep Bold.

The final typeface used throughout this campaign is Fairplex Wide OT. The family is used for all of the body text and for any larger blocks of text. This allows for an easy read of information throughout the campaign.

### Peacock Deep Bold

A B C D E F G H I J K L M N  
O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n  
o p q r s t u v w x y z

### Brush Script MT Italic

A B C D E F G H I J K L M N  
O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n  
o p q r s t u v w x y z

### Fairplex Wide OT

A B C D E F G H I J K L M N  
O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n  
o p q r s t u v w x y z



## Chapter 4

### Final Solution

#### *Infographics*

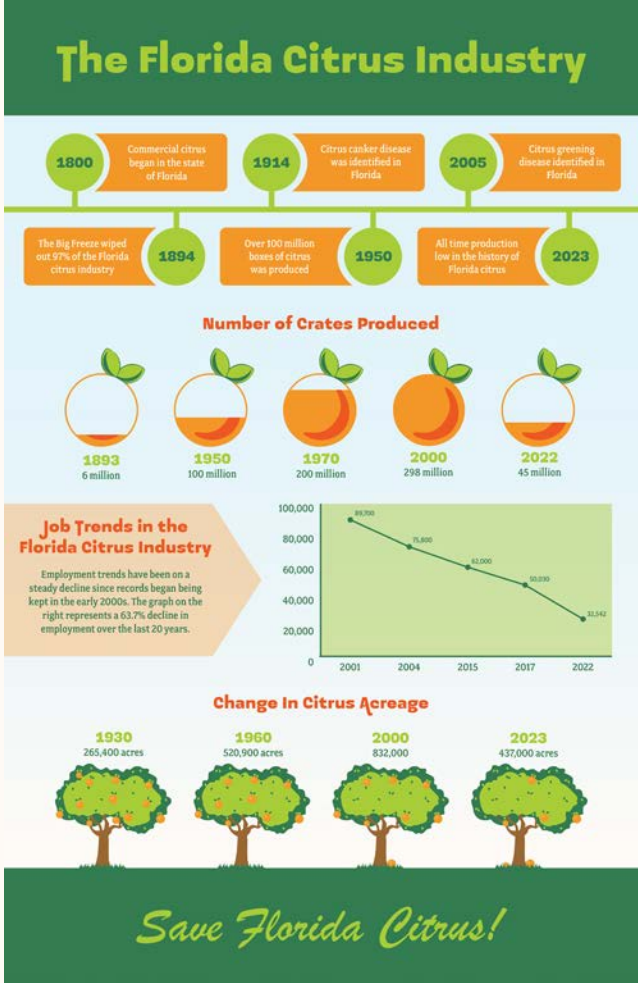
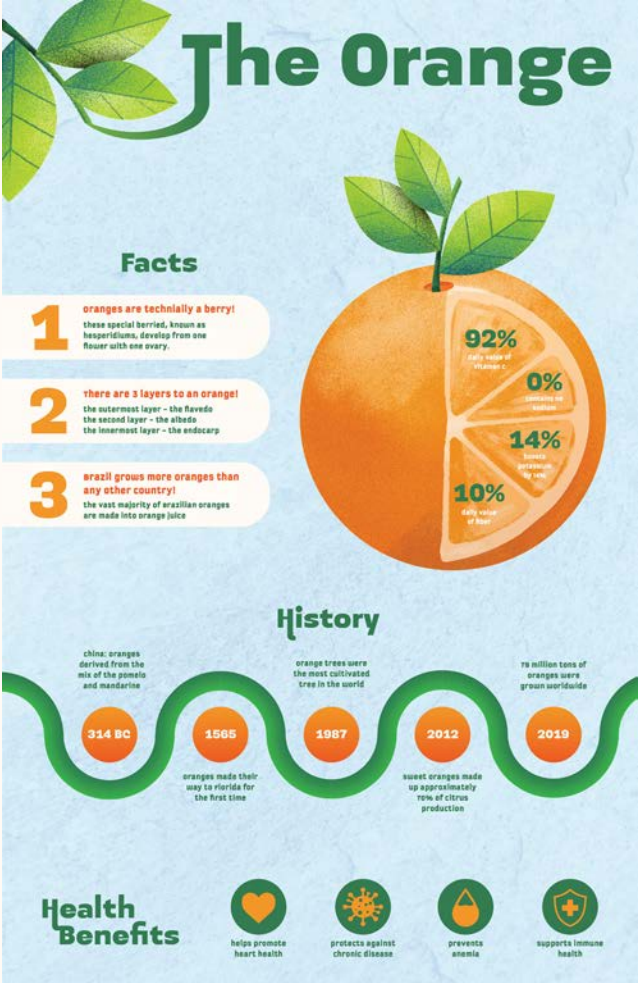
Throughout the development of the plan for the types of designs I was going to produce, I kept leaning toward the idea of infographics. Since not many people are aware of the importance of the citrus industry as well as its' current state, I thought it was important to inform the general population about this information. Through research, I developed a plan that would allow me to create a design that would inform and interest the public about the citrus industry.

For the infographic stage, I had a pretty good idea of what I wanted to accomplish. I wanted to create two infographics: one that looked at the benefits of oranges and one that showed the history of the Florida citrus industry. The first one came pretty easily. Finding information on why oranges are beneficial was simple and placing all of that information went relatively smoothly as well. The second infographic, however, is where I began to run into some problems. There is so much information on the history of the Florida citrus industry that it could not all be fit on one infographic. With that being said, I decided to create a series of infographic that could either be displayed separately or be displayed together as a whole. That still wasn't enough. I had way to much information still. That's when the research came in handy. I was able to look back at the research that I had discussed early in this thesis and develop a plan of action for what information was important to the cause I was trying to portray. This led to the final design solution, which was one infographic for the health benefits and one infographic for the history of the citrus industry.

As I continued developing this information to go along with the infographic, I yet again ran into another problem. There was still too much information to include in the infographic. Taking what I know about infographics, the less text the better, I decided to break down the information even more, keeping only the most important details. This helped a lot by allowing me to continue designing a simple, yet effective infographic that touches on the key points of the Florida citrus industry's history.

With that being said, the infographics found in this campaign have been thoroughly created using the research portion of this thesis as well as through trial and error. Each infographic draws its information directly from the research portion of the thesis. In the first infographic, the focus is on all of the benefits of the orange. This includes health benefits, a brief history of the orange, fun facts about the orange, and nutritional information about the orange. All of this information was drawn directly from research. The goal of this infographic is to show the viewer all of the benefits they can obtain by purchasing oranges, and thus supporting the Florida citrus industry.

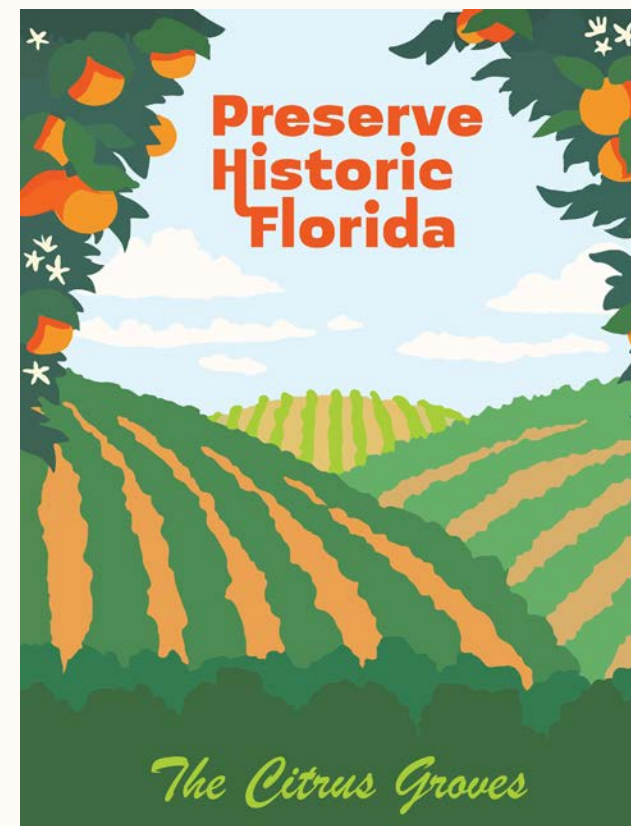
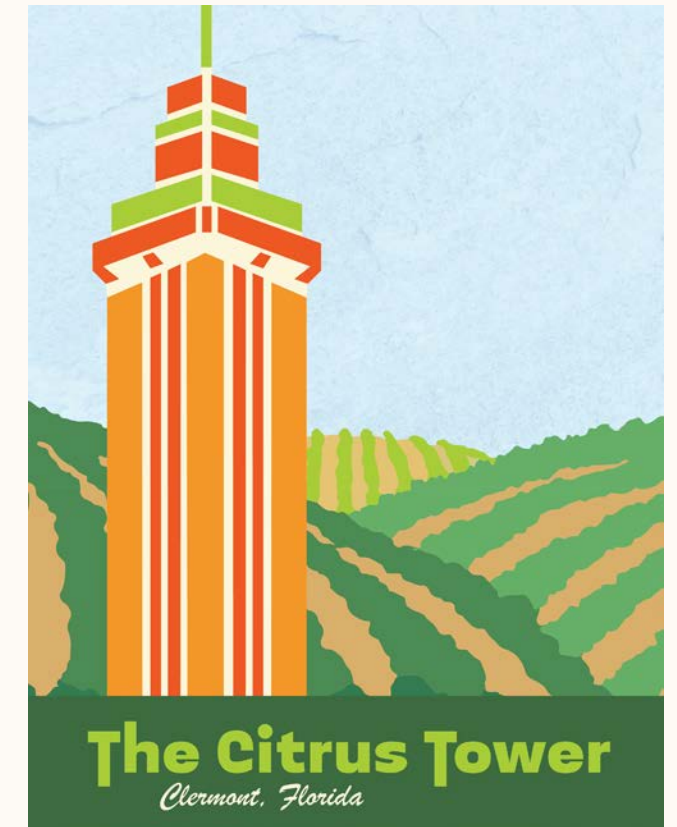
The second infographic focuses specifically on the history of the Florida citrus industry. The information included in this particular infographic has been broken down into different sections based on the portion of history being discussed. The important and relatable factors of the decline of the citrus industry are displayed in this infographic. For example, the decline of oranges produced, the decline of employment, and the loss of available grove acreage are all shown in this infographic. The goal of the second infographic is to inform the viewer of the current state of the industry and its downward trend.



### Posters and Prints

When thinking about another useful campaign material, I began to think of what is currently well received by a wide range of ages. This is when I developed the idea to create some sort of print/poster series that would relate the information found in the research chapter of this thesis to the general public that would be viewing or using these campaign materials. Throughout this series of poster/prints, I have developed a plan that will incorporate the historical monuments and iconography, that was used in past citrus marketing and campaigns, into posters, prints, and stickers. With these materials, it is my hope that the viewer would be able to take something with them that is a reminder of the Florida citrus industry.

The poster/prints portion of the design was also drawn deeply from the research portion of this thesis. The designs in this portion of the campaign all derive from historical landmarks or iconographic items that were quintessential to the Florida citrus industry at its peak. This includes the famous citrus tower, orange juice, and the orange itself. All of these elements will also be morphed into sticker versions for additional campaign exposure to the younger demographic.



### Stickers

One thing that is very popular amongst the younger generation is stickers. When thinking about an element of design that could accompany this campaign, I wanted to think of something that younger people might enjoy.

I decided to create a sticker series using some familiar elements from the citrus industry. These stickers use the same design style, font family, and color palette that the rest of the campaign uses.

One reason I believe stickers are a great addition to this campaign is that they are quick and cheap to produce, they are cost friendly to buyers, and they are often posted on items that are regularly used. This allows for another demographic to become aware of the citrus industry and all of the history that comes along with it.

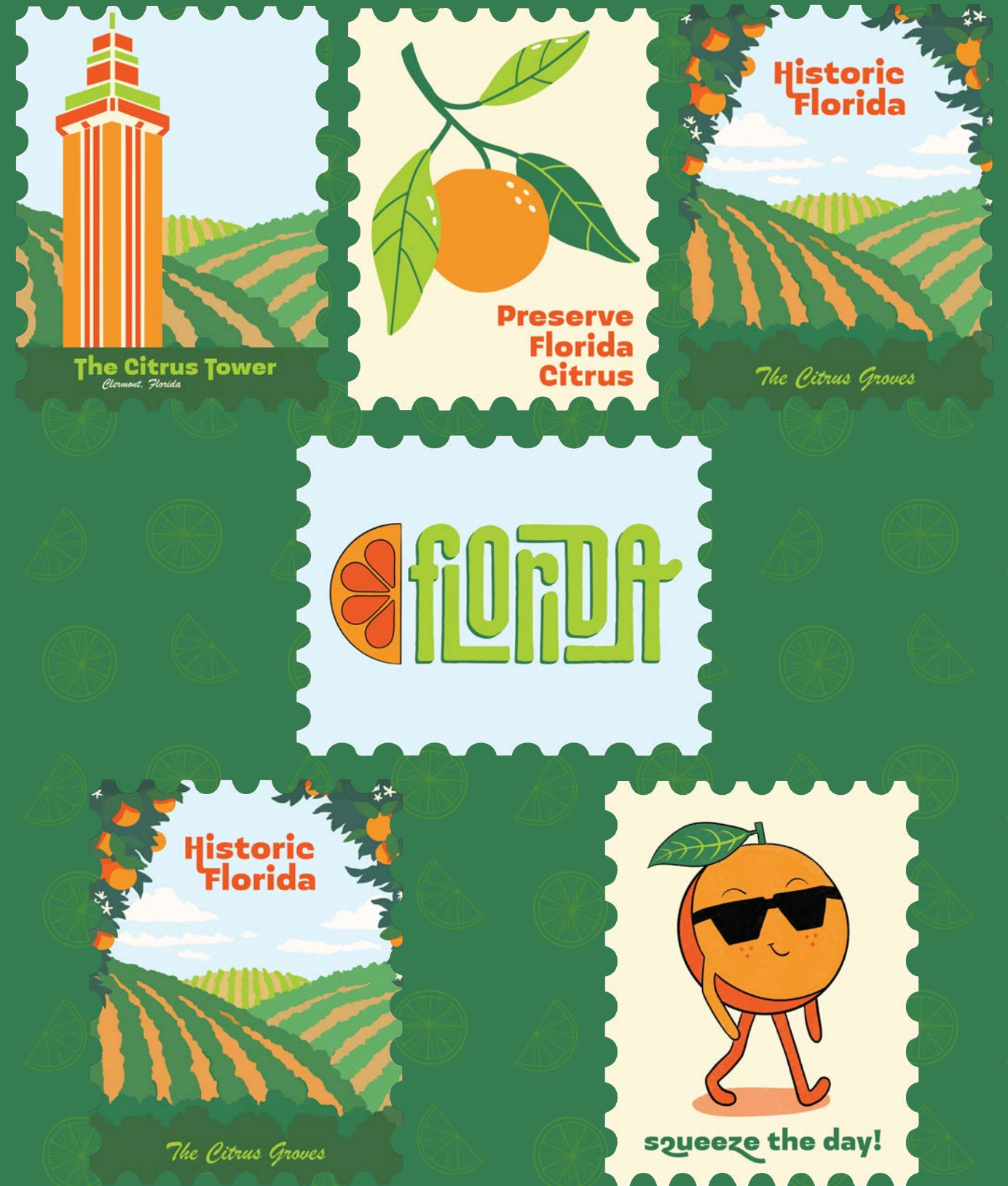




### Forever Stamp Series

The last plan that was developed for this thesis, in terms of design, was a stamp series. This series came about after some original photography design elements had to be adjusted. Originally, I wanted to juxtapose photographs of old orange groves with what currently stands on the land that used to be groves. The main problem was that the oranges don't ripen and turn yellow until November sometime, which was too late to wait to complete this part of my thesis. I ultimately decided to just get rid of the whole idea and use a new idea. This is where the stamps came into play. In this stamp series, similar concepts will be explored as that of the poster/print series. The idea is to take several iconic elements of the citrus industry and implement these ideas onto a forever stamp. A portion of the proceeds collected from these stamps would then go toward scientific research and preservation of Florida citrus.

Like the poster/print portion of the design campaign, the stamp collection was thought of through researching important landmarks, icons, and historical moments. These stamps also include the famous citrus tower, an alligator juggling oranges, and the orange itself. While these are smaller more precise designs, after doing research, a stamp collection will be a significant booster of awareness for this campaign. It has been found that most adults need to buy stamps. While this doesn't happen regularly, it is still a good way to get exposure of this awareness campaign all across the country, not just in Florida.





# Chapter 5

## Conclusion

The adult population of Central Florida fails to understand the consequences of the decline of the citrus industry in the state of Florida resulting in lost jobs and wages, lost tax revenue, and a loss of acreage due to the increase in housing and infrastructure from the influx of people moving to Florida. The decline of the citrus industry in Florida is a large problem that not many people recognize as an issue.

With nearly 6.9 billion dollars earned for the state of Florida along with the support of approximately 33,000 jobs, the citrus industry is a major contributor to the state's economy (Cruz). With the decline of this industry, Florida and the families living there, could face huge economic challenges. Over the years, this problem has sprung from several different factors including citrus disease, inclement weather, and less available acreage due to population growth in Florida. With all of these factors, the citrus industry is struggling to stay productive and successful. Since identifying this problem, one solution that has come to mind is to raise awareness around the state of Florida. By raising awareness through design, we hope to assist in bringing back a thriving and important part of Florida's history and economy.

Most of the research done on this subject focuses on how to assist the citrus industry in a scientific sense. Few researchers have taken the approach of how to connect art and design to make the public aware of the seriousness of this situation. With the public's awareness, there may be more support both financially and scientifically to aid in the efforts to save the Florida citrus industry from its' continuous decline.

The designs presented in this thesis touch on how the connection between art and design impacts how viewers think about certain topics. Most often, when you give your audience something tangible that they can take home with them, the message is more effective. It is more effective in that the idea stays with the viewer longer because the viewer is regularly looking at the product you have given them. This is the goal of this thesis campaign: to take these designed poster, stamps, stickers, and infographics, and make the citrus industry stick in the viewers' mind. This will hopefully raise awareness of the importance of the industry, or at the least cause the viewer to want to do more research on the topic.

By designing this campaign around a pro-growth idea, it was the goal to show viewers the positives of having a strong citrus industry that ultimately shapes the culture of Florida. This idea was reflected throughout the designs of this campaign by using a bright color palette and playful designs.

Throughout the process of developing a plan of action for this thesis project, all of the information obtained in the research chapter helped guide the decisions made in terms of design and the overall outcome of the project. The research that was conducted at the beginning of the thesis helped guide, inform, and solve a real-world problem with a hypothetical solution that I believe can truly impact the state of the Florida citrus industry. This solution can be seen in the campaign created for this thesis project. By thoughtfully choosing a color palette, typography, and other important elements of design like historic landmarks and iconography, a campaign was created to help raise awareness of the decline of the Florida citrus industry.

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