SWEETPOTATOES IN A GLOBALIZING WORLD: THE EFFECTS OF GLOBALIZATION ON NORTH CAROLINA'S SWEETPOTATO INDUSTRY

by

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This study examines the form and effects of globalization on North Carolina's sweetpotato industry. A commodity chain analysis was conducted by constructing North Carolina's sweetpotato commodity chain (SPCC) through the collection of quantitative data and interviews with various individuals (growers, packers, exporters, etc.) within North Carolina's sweetpotato industry. This study has demonstrated that there are several effects of globalization seen throughout the sweetpotato commodity chain, including the changing roles of the various actors within the SPCC and how North Carolina's sweetpotato industry functions through changes in marketing, distribution, and various technologies. As globalization has unfolded, the SPCC has expanded and lengthened, incorporating new sets of actors, such as third-party food safety auditors, into its nodes, who have influenced the particular form of globalization within the North Carolina sweetpotato industry. Institutions that have played a particularly influential role have been the state and grower organizations. Findings have also shown that an industry must be prepared, through investments in technology, marketing, and distribution, in order to meet the demands of new buyers that globalization brings to a commodity chain. Globalization comes swiftly when an industry is ready to meet the demands of entering the global market, as this study shows by tracing the history of North Carolina's sweetpotato industry and its role in the global sweetpotato economy. Finally, I show that globalization has had positive and negative

effects on North Carolina's sweetpotato industry, suggest how these effects can be used as learning tools for other industries yet to globalize, and suggest further areas of research within the sweetpotato economy.

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TABLE OF CONTENTS

LIST OF TABLES AND FIGURES…… vii

ABBREVIATIONS…….. ix

CHAPTER ONE: THEMES AND METHODS…….. 1

1.1 Introduction……...1

1.2 Relevant Literature…… 4

1.2.1 What does “globalization” mean?…….. 5

1.2.2 The global-local connection…… 7

1.2.3 An historical process that impacted the globalization of the agri-food sector…… 7

1.2.4 The role of strategies of monopoly capital in agri-food globalization…… 9

1.2.5 Commodity systems analysis …… 10

1.2.6 Commodity chain analysis……. 14

1.2.7 Examples of Commodity chain analysis……. 16

1.3 Themes Drawn from the Reviewed Literature……. 18

1.4 Qualitative Methods……. 23

1.4.1 Primary Data Sources……. 25

1.4.2 Secondary Data Sources……. 27

1.5 Organization of Thesis……. 27

CHAPTER TWO: THE GLOBAL SWEETPOTATO ECONOMY AND NORTH CAROLINA…….. 29

2.1 The Global Sweetpotato Economy…… 30

2.2 The United States within the Global Sweetpotato Economy…… 37

2.3 North Carolina within the Global Sweetpotato Economy…… 43

2.4 Summary of Findings…….. 48

CHAPTER THREE: THE SWEETPOTATO COMMODITY CHAIN……. 51

3.1 The Sweetpotato Commodity Chain……. 51

3.2 Actors Along the Sweetpotato Commodity Chain…… 54

3.2.1 Micropropogation/Seed Grower……. 54

3.2.2 Research and Development…… 55

3.2.3 Grower…….…… 55

3.2.4 Packer-shipper…..…….55

3.2.4 Broker……..…… 55

3.2.5 Distributor……56

3.2.6 Buyers……. 56

3.2.7 Consumers…….. 57

3.3 Buyers of Sweetpotatoes…….. 57

3.3.1 Food service and Restaurants…… 58

3.3.2 Processors/Canneries……..59

3.3.3 Retailers/Wholesalers…… 63

3.4 Other Actors……. 64

3.4.1 Labor…….. 64

3.4.2 Transportation logistics…….. 65

3.4.3 Support agencies and governance institutions……66

3.5 The Role of Food Safety Standards……... 66

3.6 Summary of Findings……70

CHAPTER FOUR: THE GLOBALIZATION OF NORTH CAROLINA'S SWEETPOTATO INDUSTRY…… 72

4.1 What is Considered an International Market?..... 72

4.2 Historical and Present-day International Sales of USA and NC Sweetpotatoes….. 73

4.3 Changes in the Sweetpotato Industry…… 79

4.3.1 Technological changes that have changed the sweetpotato industry…… 80

4.3.2 Sweetpotato varieties…….. 88

4.3.3 Changes in culinary cultural attitudes towards sweetpotatoes…… 93

4.4 North Carolina's Competition in the Global Sweetpotato Market…… 94

4.5 Summary of Findings…… 102

CHAPTER FIVE: THE ROLES OF ORGANIZATIONS AND STATE AGENCIES IN THE SWEETPOTATO COMMODITY CHAIN…… 104

5.1 North Carolina State University…….106

5.1.1 Departments involved in sweetpotato research……106

5.1.2 The importance of plant breeders to North Carolina's sweetpotato industry……..... 108

5.1.3 Views on NCSU from participants…….. 110

5.2 North Carolina Sweetpotato Commission…… 111

5.2.1 The NCSPC and culinary culture…….117

5.2.2 Views on the NCSPC from the participants…… 122

5.3 Other State Agencies Connected to the SPCC……...125

5.3.1 USDA Foreign Agricultural Service……125

5.3.2 Southern United States Trade Association…….. 126

5.3.3 The NCDA International Trade Office…… 126

CHAPTER SIX: CONCLUSIONS……...130

REFERENCES…….. 140

APPENDIX A……146

APPENDIX B……147

LIST OF FIGURES AND TABLES

Figure 1…… 31

Table 1…….. 32

Figure 2…… 34

Table 2…….. 36

Table 3……... 38

Figure 3…… 40

Figure 4…… 41

Figure 5…… 44

Figure 6……..45

Figure 7……..47

Figure 8……..52

Figure 9……..53

Figure 10……75

Figure 11…….. 76

Figure 12……78

Figure 13……85

Figure 14……87

Figure 15……89

Figure 16……97

Table 4…… 98

Figure 17…..... 114

Figure 18…… 121

ABBREVIATIONS

Commodity Chain Analysis	CCA
Commodity Systems Analysis	CSA
Employee (Assigned Number)	E##
European Union	EU
Farmer/Grower (Assigned Number)	F##
Foreign Agricultural Service	FAS
Foreign Agricultural Office	FAO
Global Commodity Chain	GCC
North Carolina Department of Agriculture and Consumer Services	NCDA
NCDA International Trade Office	ITO
North Carolina State University	NCSU
North Carolina Sweetpotato Commission, INC	NCSPC
North Carolina Sweetpotato Commission Foundation	NCSPCF
Produce Company (Assigned Number)	PC##
Researcher (Assigned Number)	R##
Southern United States Trade Association	SUSTA
Sweetpotato Commodity Chain	SPCC
United States Agency of International Development	USAID
United States Department of Agriculture	USDA
United States Department of Labor	USDL
United State Sweetpotato Council	USSC

CHAPTER ONE: THEMES AND METHODS

1.1 Introduction

In a recent conversation with two leading sweetpotato breeders at North Carolina State University, the sweetpotato[1] market of North Carolina was described as right on the cusp of great change due to the increasingly globalized nature of food systems. A subsidiary of ConAgra, Lamb Weston had opened the first frozen sweetpotato processing plant in Delhi, Louisiana (PotatoPro, 2010) to process sweetpotatoes from Louisiana and the surrounding states, mostly turning them into sweetpotato fries.

The researchers discussed two other events that were coming around the corner for sweetpotato production: the prospect that a well-known fast-food restaurant will be considering the feasibility of offering sweetpotato fries in its restaurants across the globe and the increasing popularity of sweetpotatoes in international markets. The researchers suggested that all three of these events would certainly influence the role of the North Carolina sweetpotato industry in the global sweetpotato economy, because they would increase demand for sweetpotatoes. In fact, several months after this conversation occurred, one fast-food chain began offering sweetpotatoes on its menu. Shortly thereafter, several other fast-food chains added various sweetpotato products to their own menus.

The next few years are pivotal for sweetpotato production in North Carolina and its continuing role in the global food economy as more consumers demand various sweetpotato products in their stores and restaurants. North Carolina has positioned itself as the lead sweetpotato supplier due to its rapid rise in sweetpotato acres. Typically, sweetpotato acreage

[1] Throughout this thesis, sweetpotato is deliberately spelled as one word unless directly quoting a source where it is spelled as two words (i.e., sweet potato). The one-word spelling was officially adopted by the National Sweetpotato Collaborators in 1989. Sweetpotato (*Ipomoea batatas*) must not be confused in the minds of growers, packer-shippers, other professions within the sweetpotato industry, and especially consumers with potato (*Solanum tuberosum*) or the yam (*Dioscorea sp*.) which are also grown and marketed commercially.

within North Carolina increases by no more than five thousand acres per year, but this has changed in recent years. In 2009, sweetpotatoes were planted on 47,000 acres in North Carolina. The following year, there were 55,000 planted acres. In 2011, North Carolina experienced a substantial increase to an estimated 65,000 planted acres. North Carolina sweetpotato farmers, who already export heavily to Canada and Europe, continue to focus on expanding the export market for their product and increasing their presence in value-added sweetpotato products (such as, frozen sweetpotato fries and canned sweetpotatoes). The sweetpotato industry, its role in North Carolina and the effects globalization has on the North Carolina sweetpotato industry is explored in this study.

"Globalization" and the "global food economy" are often tossed around in conversation without any critical thought as to what they mean and what that means for producers and consumers of food. Agriculture is different from other commodities on the market. Humans need food to survive, agriculture is dependent on the land and weather, and food has a finite time before it spoils. It is important to continuously examine what is occurring in agriculture as it is constantly changing; new technology affects seed, agri-food practices, and how food is produced and processed. Globalization is a part of the agricultural sector today and because of such, examining its effects, or influences, on agricultural goods is a worthwhile pursuit.

In the past few decades, the North Carolina sweetpotato industry has become increasingly globalized as it expands into global markets. Since the early 2000s, the North Carolina sweetpotato industry has seen its distribution grow as the global agri-food market becomes more familiar with and demands more availability of the sweetpotato throughout the year instead of solely during the winter months. The most significant changes that have occurred North Carolina's sweetpotato industry started after 2001. NC had already seen some sweetpotato

exported (with the first recorded year of sweetpotato exports was in 1996, valued at USD 512,737), but by 2010, the value of sweetpotatoes exports had increased to USD 36,588,127. This was an increase of more than 7000% in total dollars of sweetpotatoes exported. Adjusting these dollar amounts for inflation still shows a substantial increase of 5100%.[2]

Because globalization in the North Carolina sweetpotato industry is relatively recent, this study focuses on the time period between 1950s and the most recent year with verified data, 2010. My research investigates the following four questions: 1) How does the North Carolina sweetpotato industry fit into the global sweetpotato economy? 2) How has the North Carolina sweetpotato industry evolved during the time period examined? 3) What are the current market trends that influence the North Carolina sweetpotato industry, including its production, distribution, and consumption? And ultimately, 4) what does the case of the sweetpotato industry tell us about globalization and its effects on the different aspects of any given industry? These questions are examined and answered through the use of a commodity chain analysis.

To my knowledge there are no studies that examine the sweetpotato as an economic commodity. Research on the sweetpotato tends to examine sweetpotato viruses, diseases, traits, and technologies, such as storage and curing, which are used in the planting, harvesting, and processing of sweetpotatoes. There is one book that examines the sweetpotato as an "untapped food resource" for developing countries (Woolfe, 1992). This book focuses on topics that the aforementioned articles cover in addition to post-harvesting procedures, livestock feed use, and consumption of the sweetpotato as it occurs in developing countries. While there is valuable information in Woolfe's (1992) discussion of sweetpotatoes as a food source, her focus is primarily on using sweetpotatoes to combat food shortages and malnutrition. This thesis is

[2] Inflation was calculated using www.westegg.com/inflation calculator. USD 512,737 in 1996 equals 2010 USD 703,109.21.

focused on sweetpotatoes as a commercial industry, not as the subsistence effort discussed by Woolfe (1992).

This research is significant for at least two reasons. First, the sweetpotato is an important vegetable throughout the world, particularly in the so-called developing or underdeveloped world where it is a primarily subsistence crop. Culturally, it is also an important vegetable in the United States, because of its association with the holiday season and because it is a native plant of the Americas. Economically, sweetpotato exports now account for about 10 to 20% of sweetpotato production (NCDA&CS, 2011). In addition, North Carolina's exports increased 22% in 2010 over 2009, with sweetpotato exports increasing the most from 2009-2010 (compared to tobacco leaf, raw cotton, lumber, and poultry, the other significant exports from North Carolina) (NCDA&CS, 2011).

Second, the North Carolina sweetpotato industry is at a stage in globalization that often is looked back on in the past tense instead of examined in the present tense as changes are occurring on an almost daily basis. North Carolina's sweetpotato industry is both globalized and globalizing at this point in time. This presents a, perhaps rare, opportunity to examine what occurs in an industry as it globalizes. By "globalized" and "globalizing," I mean certain segments of the sweetpotato commodity chain (SPCC) are globalized, while others are not globalized or are on the verge of becoming globalized. The literature on globalization and the agri-food sector is extensive. Below I review literature that has informed this thesis.

1.2 Relevant Literature

The literature that has informed this research includes studies concerned with: the meaning of globalization; the connection between local communities and the global market; and processes that influence agri-food globalization. Before delving into the relevant literature, it is

important to stress that the global food system is not clean-cut and does not exist within neat lines; it is complex and shifts dramatically overnight—sometimes literally—when major events occur, such as an outbreak of a food-borne illness. Due to the complexity of today's agriculture, it is worthwhile to examine the historical and contemporary processes at work in today's global food system.

1.2.1 What does "globalization" mean? Globalization has become a ubiquitous term when describing today's agricultural economy. It is seen throughout the agricultural sector and increasingly influences the sweetpotato industry of North Carolina. Lapping (2004: 141) argues that from a U.S. perspective, the agricultural sector has experienced the effects of globalization arguably to a greater extent than any other sector, excluding the apparel sector, as many of the foods now consumed in the United States are imported from other parts of the world. The term "globalization" is a slippery concept variously defined depending on who is asked.

According to Philip McMichael (1997: 645), globalization is "a contradictory historical project" with market liberalization as a core aspect of this project. Globalization as it is conceived today is the ability of all nations to participate in "a *universal* (sic) way of organizing the social and natural world" (McMichael, 1997: 646). Globalization is different from modernization, which McMichael characterizes as "learn from, and catch up with, the west," because globalization promotes the sentiment of "find your niche in the global economy" (1997: 646). This difference is important, because a commodity chain can become modernized without ever leaving a country's borders. For a commodity chain to become globalized it must at least expand beyond a country's borders. McMichael (1997) argues that today globalization promotes differentiation in the economy, allowing every country the opportunity to use niche markets to increase their presence in the global economy. For many participants in this study, North

Carolina's sweetpotato is a niche commodity in the global economy. Globalization allows North Carolina's sweetpotato industry to use this niche status to its advantage on the global market.

In Pritchard and Burch's (2003: 10) study on agri-food globalization in the processing tomato industry, the authors defined globalization as a process, one that is "forever incomplete, contested, and dynamic." This is because links and connections are continuously formed, broken, or altered. They are affected by the national and cultural differences (and any changes that occur within nations and cultures) between locations. Globalization is not a stable process, but a very unstable process affected and challenged by many different forces within the global economy (national regulations, food safety standards, cultural and national identities, religion, etc.).

According to Sonnenfeld et al. (1998: 153), in their study of Washington apples, defined globalization as access to global markets, arguing that "globalization is characterized not by the cross-national production of the commodity, but by the internationalization of its distribution." Friedland (2004: 5) defined globalization within the agri-food sector as processes that lengthen and spatially expand the commodity chains outside of local, national, and regional boundaries into more complex chains that further separate consumers from the people who grow and harvest their food. These are just a few of the definitions given to globalization. Each has influenced the definition of globalization used for this study.

For the purpose of this study, the definition of globalization used here includes Sonnenfeld et al.'s (1998)view of globalization—access to global markets—coupled with the definition of globalization as an ongoing process that will never be completed, is complicated, and lengthened and expanded the spatiality of the commodity chain into the global market. Globalization has become increasingly necessary for the continual growth of North Carolina's sweetpotato industry since at least the 1970s. During the 1970s, sweetpotato packer-shippers

first began exporting sweetpotatoes to military bases in international markets, giving them their first experiences in shipping sweetpotatoes overseas. Globalization is a process that continues to unfold daily as the sweetpotato expands beyond the holiday season and the US's borders.

1.2.2 The global-local connection. Globalization influences and contributes to the evolution of industries at the local, regional, and national levels as these industries gain access to global markets. Analyzing globalization at the local level and its effects on communities can help in the development of policies that will aid communities as they adapt to changing "macro social forces" and help in "our understanding of macro-micro social linkages" (Sonnenfeld et al., 1998: 152). Obviously, the local economy does not operate in a vacuum or exist in a bubble; what occurs at the global and national levels impacts the local levels, communities, and the people who live in them.

In order to have continued success at the global level, production at the local level is affected in varied ways. For example, in order to reduce costs, a sweetpotato processing plant focuses on how much it pays for each sweetpotato (thus affecting the income of the grower) and how much it pays employees at the processing plant. As trade negotiations were established to reduce global trade barriers, local farms are unable to compete with large agri-food conglomerates on any meaningful scale, therefore impacting local economies (Heffernan, 1998: 56). This type of impact on local points of production and national markets is across all agricultural commodities to greater or lesser degrees depending on the commodity.

1.2.3 An historical process that impacted the globalization of the agri-food sector. Industrialization, while it occurred long before modern globalization, is not separate from globalization, because it laid the foundation for nations to be capable of integrating their food systems into a global food system. The industrial revolution changed the world when it occurred

during the long nineteenth century (1789-1914), including the agricultural sector (Coclanis, 2003: 72). Industrialization changed every aspect of agriculture: how many farmers operated and related to the land, customers, creditors, the state, and their competition; how farmers grew their crops; and the organization and location of farmers' markets (Coclanis, 2003: 74).

The once family-controlled food system quickly became a commercial agricultural sector as farmers were encouraged to produce more and more food to feed urban populations, causing distance between the once close farmer-consumer relationships (Heffernan, 1998: 46). Industrialization increased the market for agricultural goods due to several changes: population and incomes increased; transportation technologies improved, allowing for more travel between farms and population centers in a shorter amount of time; and improved communication between actors in the agricultural industry (Coclanis, 2003: 75).

This is seen clearly in the creation of companies (or firms) that would act as the intermediary between the farmers and consumers; industrialization changed a once community-centered farm operation "into a multi-stage food system with hundreds of firms competing" at the different stages within the newly-formed food system (Heffernan, 1998: 47). However, the farmer was not necessarily guaranteed access to these hundreds of firms, because the area where he grew his agricultural goods may only have access to a handful of such firms (Heffernan, 1998: 47). This affected who had control in the relationship. Generally, firms had more power due to the capital (money) and influence (in the community and in policy decisions) they possessed. This also occurred because the farmer probably did not have access to other outlets to sell his/her agricultural goods.

In the sweetpotato industry, this is best illustrated by the placement of processing plants. With a limited number of processing plants for specific commodities available in an area, a

farmer does not necessarily have a choice between firms when deciding who (s)he will sell his/her goods to, especially if a commodity must be processed in a certain amount of time before the commodity spoils. This in turn affects the local community, as a farmer may have to sell his/her goods to a processing plant in a neighboring town/county/state, thus causing money to leave the community. This is seen today in the sweetpotato industry, which will be discussed in a later chapter.

1.2.4 The role of strategies of monopoly capital in agri-food globalization. Globalization in the agricultural sector, at its core, is about money and strategies used to gain more money, specifically more profits. As such, Heffernan (1998) argues that there are three major strategies of monopoly capital (the concentration of money in a few firms) that have influenced the agricultural sector in the United States: cross-subsidization (horizontal integration), vertical integration, and globalization. Here, horizontal and vertical integration as it relates to the sweetpotato industry are discussed.

Horizontal integration in its simplest form means a corporation (or firm or conglomerate) dominates a sector in several areas; for example, cross-subsidization occurs when not only does a corporation rank in the top five corporations selling sweetpotatoes, but also in the top five corporations selling several other vegetables. Firms used this as risk management; they could sustain losses in one area, but remain profitable as a whole due to successes in other areas. Thus, efficiency (better known as comparative advantage) is not the key factor to surviving; the determining factor of success for large firms is the ability to cross-subsidize (Heffernan, 1998: 53). Some large producers of sweetpotatoes have themselves cross-subsidized by producing several crops in order to maintain overall profits in case an event, such as severe weather, decreases or ruins the sweetpotato crop.

Vertical integration refers to a firm actively involved in several stages of a commodity chain, such as simultaneously being a grower-packer-shipper. Vertical integration is important to firms as they increase their control in particular stages of a commodity chain, even trying to gain sole ownership over some stages of a commodity chain in order to solidify their economic power in the global food system (Heffernan, 1998: 53). Vertical integration has played a role in producing the so-called global food system, because of its integration of various nodes under one firm within commodity systems. Key actors in the sweetpotato chain have vertically integrated several segments of the commodity chain under their business umbrella in order to minimize expenditures to middle men (like packer-shippers or brokers) and maximize profits.

1.2.5 Commodity systems analysis. In order to determine the effects of globalization on the North Carolina sweetpotato industry, a commodity chain analysis is used, which was informed by commodity systems analysis literature. While commodity systems analysis requires a far more in-depth and expansive analysis than the scope of this thesis, CSA has informed this study because of the commodity systems analysis' focus on the wider system (multiple chains) in which a single chain exists. There are dozens of sweetpotato commodity chains throughout the world and while this thesis only closely examines North Carolina's sweetpotato commodity chain, it does situate the commodity chain within the wider, global sweetpotato economy.
The commodity systems analysis framework as it was first envisioned by Friedland (2001) in 1984 included five areas involved in commodity systems: labor processes, grower organization, labor, science, and marketing and distribution. In these five areas, the political, social, and economic contexts of a commodity are examined in order to describe how a commodity is transformed from a raw product to one that had acquired value as it pass through the five stages. However, Dixon (1999) argued that Friedland's initial framework lacked the inclusion of

consumers, who are an important aspect of a commodity system, which led her to create what she calls a cultural economy model.

By cultural economy model, Dixon (1999) draws on the CSA framework and infuses it with the culture that surrounds the consumption of a commodity by including the "input and interests of a range of actors beyond the agricultural sector" (Dixon, 1999: 153). Specifically, Dixon (1999: 157) describes the cultural economy model as "a cultural economy perspective [which] adopts the key interrelationship as that between the economy, social identity, and politics." She developed this model by introducing actors into the model from production processes, distribution and exchange processes, and consumption processes.

Production processes are the processes that resulted in the production of commodities, including: production practices; grower organization and organizations; labor as a factor of production; science production and application; and marketing and distribution networks (Dixon, 1999: 154-155). Distribution and exchange processes include: marketing and distribution networks; retailing practices and organization; food service practices; labor as a factor of distribution; food knowledge and discourse production; and regulatory politics (Dixon, 1999: 155). Dixon (1999) includes the consumer in the analysis, recommending focus on consumer processes that include: the process of production; means of access; delivery dimensions; the eating environment; and the experience of consuming the food.

Dixon integrates these three areas of processes involved in the production, distribution, and consumption of a commodity to construct an adapted commodity systems analysis which,

> "brings alive the social reality of commodities…assumes that assigning price is only one part of the valuation process…acknowledges productive units like families, households, and communities in addition to individuals and firms, which dominate many contemporary agri-food accounts…expands our understanding about what constitutes output…invites us to

> examine the exchanges that may be occurring beyond market exchange…enlarges the sphere of distribution beyond the movement of products between producers and consumers [and] highlights women's roles across the food system" (1999: 157-158).

Dixon's conceptualization of a commodity systems analysis involves a more extensive array of actors involved in the analysis than was involved in the original formulation of the CSA. These actors had always been a part of the reality of a commodity's cycle, but were simply not included in Friedland's initial framework.

Following Dixon's reconceptualization of Friedland's commodity systems analysis method, Friedland himself wrote a "Reprise on Commodity Systems Methodology." Friedland (2001: 99) expanded the original five areas of a commodity systems analysis—"labor process, grower organization, labor, science, and marketing and distribution"—to include the additions of "scale, sectorial organization and state involvement, and culture" (2001: 99). Several of these areas will be explored in this study on sweetpotatoes, including labor (from the growers' points-of-view), science (research and development), grower organization, marketing and distribution, state involvement, scale, and culinary culture.

Friedland writes that "each commodity system…develops a distinctive history as distribution, marketing, and scale change" and if a commodity is to be analyzed, it "should be studied historically and its spatial and social relations…must be examined" (2001: 93-4). The sweetpotato commodity chain, as will be elaborated on later, has undergone significant changes, the history of which continues to influence the chain today.

Friedland makes two important observations that are very applicable to this study in regard to the role of the state in agricultural commodities. While studies of commodities mention the role of the state, often in passing without explicit analysis, "the state should never be

taken for granted," because of its role in regulations that affect the agricultural sector (Friedland, 2001: 96). He also argues that it is important to consider the degree to which the state is involved in a commodity, including the history of its involvement and the current and future involvements of the state (Friedland, 2001: 97).

Pritchard and Burch's (2003) study of processing tomatoes exemplifies how a commodity systems analysis is used to study a commodity. Pritchard and Burch sought to understand the "dimensions and character of 'agri-food globalization'" by examining the international commodity system of processing tomatoes (2003: 1). Pritchard and Burch succinctly (as one can) describe agri-food globalization: "[it] is generally associated with reductions in barriers to trade and investment among nations, so that commerce increasingly takes place within an international arena of production and competition" (2003: 1). Yet, they continue, despite the numerous articles and books discussing agri-food globalization, little is known about "how advanced are these developments, are they inevitable, and what do they mean for farmers, companies, and consumers" (Pritchard and Burch, 2003: 1). Here is where they seek to fill in the gap of knowledge and so, too, does this thesis, albeit not as in-depth as Pritchard and Burch (2003) have done with the processing tomato.

Pritchard and Burch (2003: 3) examine the processing tomato industry principally, because the processing tomato industry was engaged (and may well still be) in "extensive, global-scale restructuring." This has occurred due to "significant growth in international demand for processing tomato products…alongside…new production and trade systems [that] have emerged, forcing existing industry players along the path of continuous restructuring and adaptation" (Pritchard and Burch, 2003: 1-2). Similarly, the sweetpotato industry is arguably on the cusp of significant change, perhaps most likely within its own processing sector as demand

for processed sweetpotatoes grows. Because of such similarities, Pritchard and Burch's (2003) analysis of agri-food globalization through the processing tomato industry proves useful to this study.

Pritchard and Burch (2003) unpacked the processing tomato into five chapters (excluding the introduction and conclusion) in their book. They examined growing tomatoes for processing, the production and consumption of tomato products, national differences in grower-processor bargaining with other countries, the European tomato, and tomatoes from developing countries. In interpreting their findings, the authors state that focusing solely, or even mostly, on market considerations for why tomatoes, or any other commodity, become increasingly globalized often leaves a study ripe for excluding "consideration of how markets are embedded in political, cultural and social contexts" and the why and how questions of these developments' impacts on society (Pritchard and Burch, 2003: 248).

1.2.6 Commodity chain analysis. The commodity chain analysis in its most complete form is the examination of a commodity from its "birth" (for example, as a seed/slip) to its "death" (for example, the remains of a vegetable placed in compost) and all the steps in between. Commodity analyses are performed in different ways, so I first examine the origins of commodity chain analysis and then draw on the works of several researchers in order to develop a commodity chain for the sweetpotato.

The term commodity chain was first used in 1977 by Hopkins and Wallerstein. When developing the term, the pair meant it to describe the analysis used to examine the inputs needed in order to create an item that is ultimately consumed (Bair, 2009: 7). This was the world-systems approach to the commodity chain, which had three features: it focused on the evolution of labor—its division and integration—in the global economy; it sought to understand why

rewards were unequally distributed among the activities involved in the world economy; and it assumed that the "spatial and social configurations of chains are linked to cyclical shifts in the world economy" (Bair, 2009: 8).

Later, Gereffi developed the global commodity chain (GCC) framework. This framework argued that chains had three dimensions that could be studied (Bair, 2009: 9). Chains consisted of, according to Gereffi (1994: 96-97), four characteristics: 1) an input-output structure, which is a "value-added chain of products, services, and resources linked together across a range of relevant industries"; 2) geographic distribution; 3) a governance structure, which is the "authority and power relationships between firms that determine how financial material and human resources are allocated and flow within a chain"; and 4) an institutional framework, which "identifies how local, national, and international conditions and policies shape the globalization process at each stage in the chain."

Global commodity chains allow various actors in the chains to connect with each other across space as well as with the global market (Bair, 2009: 9). Examining a commodity chain can provide insight into which actor(s) have what kind of impact on other actor(s) along the chain. As can be seen by both Hopkins and Wallerstein's definition and Gereffi's definition of commodity chains, this methodology is very useful for geography as a commodity chain is studied, among other aspects of it, in terms of its geographical distribution.

I would be remiss if I did not include the more recent term "global value chain" that has come into use. Global value chain analysis is used by some researchers, because, they argued, it was more inclusive of the entire range of activities and products a chain could produce (Bair, 2009: 12). Some researchers, according to Bair (2009), found the change in term simply that: a terminological change without any change in theory. Other researchers argued that it differed

from GCC in substance, because it was "influenced by transaction cost economics and a broader literature in the economics of organization" (Bair, 2009: 12). However, for the purpose of this research, I will rely on the former belief that this is simply a terminological change without a change in theory. In the next section, I discuss examples of studies that use commodity chains to examine commodities.

1.2.7 Examples of commodity chain analysis. The following are examples of commodity chain analysis to illustrate how commodity chain analysis is used to study commodities. Deborah Barndt (2008) studied the tomato as it traveled from Mexican farms to Canadian consumers. Barndt (2008) examined the global food system by tracing the journey of tomatoes and by building on the commodity chain framework developed by several researchers, including Gary Gereffi. The global food system was analyzed by Barndt (2008:69) through the examination of four relationships (which she calls two principal axes and two secondary axes): production/consumption; biodiversity/cultural diversity; health/environment; and work/technology.

These relationships are interconnected and important aspects of the commodity chain analysis developed by Barndt (2008). Her research is useful to this study, because it shows the numerous steps that a commodity travels in order to arrive at its destination and the many actors involved in producing the commodity. She provided a detailed study of each step in the commodity chain of the tomato, which has provided a kind of blueprint in the development of my research on the sweetpotato commodity chain.

Barndt's (2008: 285) exploration of the tomato as it is affected by "globalization from above" and "globalization from below" demonstrated that as globalization increases "hegemonic control" of the global food system, not only is there "consent," but resistance and challenge,

from workers, consumers, and other actors in the food system . Barndt (2008: 308) demonstrated that while corporations may control globalization "from above," there are many other individuals (those "from below") who continue to challenge "unjust and unsustainable practices" and "promote equity and ecological health" of the global food system. Corporations may hold more power in the globalization of the food system, but other actors in any food item's commodity chain also have power through resistance and efforts to change practices that may be detrimental to the whole food system.

Another example of commodity chain analysis is Suzanne Freidberg's (2004) examination of two commodity chains (or networks): France and Burkina Faso (green beans) and the UK and Zambia (prepackaged fresh vegetables). Freidberg (2004: 5) sought to show consumers' demands for "quality" food introduces "new forms of domination and vulnerability into postcolonial food commodity networks." Freidberg (2004) examined the food networks of green beans and fresh vegetables through the lens of food "quality" demands from consumers and how this may continue domination of developing countries by their former colonial rulers. Freidberg (2004: 5) used a commodity chain analysis to examine "the relationship between culture and power in globalized food provisioning." The commodity chain analysis allows researchers to understand the processes and politics involved in producing a commodity and how this affects the actors in the chain.

This is done by tracing vegetables from their origins and analyzing the roles of every actor in the commodity chain so the commodity can continue along the chain (i.e., grow the green beans a certain way, pack them a certain way, etc). As is demonstrated in the findings, the SPCC is affected by these same quality controls, changing the food quality standards within the industry in order for the commodity chain to expand into more countries.

Dolan and Humphrey (2004) also examined the trade of fresh vegetables between various African countries and the United Kingdom in the time period between the 1960s and 2000s. Vegetable trading had once consisted of "loose trade relationship," but was "replaced by tightly structured supply chains" which involved only "a handful of large retailers sourcing from a small number of Kenyan exporters" (Dolan and Humphrey, 2004: 491). This practice of working solely with importers that retailers have a strong (and long) relationship with most likely manifests itself in all relationships UK retailers have with importers. This happens regardless of whether or not the countries the UK retailers are importing from were former (but within the last century) colonies or not.

Dolan and Humphrey (2004) utilized a global value chain analysis to understand the shifts in trade relationships that occurred in the time period examined. A global value chain analysis (GVCA) allowed them to explain "why different types of global production and distribution networks arise and how they are coordinated" (Dolan and Humphrey, 2004: 491). Coordinating the value chain is costly and reduces its flexibility, but it is an important aspect of how firms can have an advantage in the commodity chain. In addition, by examining a span of over four decades, they were able to analyze the changes in the trade relationships. In particular, they examined shifts in power, how these shifts affected the production of the commodities, and how societies and their food cultures were changed.

Now that I have reviewed the relevant literature, there are certain themes I draw from the literature to inform this thesis, which are discussed next.

1.3 Themes Drawn from the Reviewed Literature

To reiterate, globalization is defined for this study as access to global markets and as a process that is forever incomplete and complicated; it results in the lengthening and spatial

expansion of commodity chains as commodities enter the global market. This definition is informed by Sonnenfeld et al (1998), Pritchard and Burch (2003), and Friedland (2004). In addition, globalization is viewed as a recent phenomenon that has occurred within modern capitalism as McMichael (1997) suggests.

While not all commodity chains extend globally (some may simply have a domestic or regional scope), using the GCC framework allows researchers to examine how the actors in the chains are "shaped by the broader organizational field of the global commodity chain to which they belong" (Bair, 2009: 16). In addition, GCC analysis allows researchers to focus "on the organizational dynamics that exist along a chain" and how a country is shaped by participating in "international production networks understood as global commodity chains" (Bair, 2005: 157). A commodity is not simply formed from raw materials; many people (or, as is increasingly common, automated machines) actually shape or transform the raw material into a final product and these people are important actors in the chain and must also be included in a commodity chain analysis.

This is particularly important when examining the commodity chain of the sweetpotato, because there is a significant amount of labor used in the production segment of the chain due to the labor-intensive nature of planting, tending, and harvesting sweetpotatoes. Within a commodity chain, it is important to "not privilege one site as the locus of reality…[but, instead] highlight contradictory organizations and lore [beliefs] available at different site[s]" within the commodity chain (Leslie and Reimer, 1999: 407). This is an especially valid point in the sweetpotato commodity chain. The development of the sweetpotato industry is influenced by a variety of actors exerting pressure at several points in the production, packing, distribution, and

consumption of the sweetpotato, a phenomenon that can be examined using a commodity chain analysis.

Commodity chains are constructed and evolve due to consumer knowledge of the commodity they are consuming (Leslie and Reimer, 1999: 406). As the consumer acquires more knowledge, their knowledge can have upstream effects on a commodity chain. The upstream effects include: product creation (such as sweetpotato fries, sweetpotato hash browns, and sweetpotato pancake mix, to name a few), companies diversifying their product offerings in order to stay competitive, and the size of fresh market sweetpotatoes (such as, European consumers prefer small sweetpotatoes while American consumers prefer large sweetpotatoes).

A potential contribution of commodity chain analysis is the ability for the geographer as researcher to play an important role in the economics of commodities. Without geography, commodity chain analysis does not hold water as a viable methodology, because its foundation is dependent on the spatial distribution of the "actors" (such as 'grower') within the commodity chain. Leslie and Reimer (1999: 410) argue that "geography plays a central role in tracing connections between sites along the chain and in revealing the complex implications of consumer actions." In order to examine the processes involved in the creation and consumption of a commodity, it is important to consider the location of each node and actors within a node.

Of course, with any methodology, there are criticisms. One criticism particularly relevant to this thesis is the perception of a chain is vertical and linear (Henderson et al., 2002: 442). By picturing the commodity chain as a linear chain, the commodity chain does not necessarily demonstrate the complexity that is involved in the production and consumption of a commodity or the multiple actors that act on a node simultaneously. Due to this, it is important that, though the analysis is called a commodity *chain* analysis, the chain is conceived more like a

web or network. Just like a necklace or bracelet may have several chains connected at various points, so do commodity chains. There are some linear elements, but by no means is a commodity chain a straight path from A to Z, but rather "complex webs of relationships between space" (Leslie and Reimer, 1999: 411).

Despite criticisms of commodity chain analysis, this framework and methodology (with incorporations from commodity systems analysis) is useful for this study. For example, the sweetpotato exemplifies Pritchard and Burch's (2003) assertion of the importance of political, cultural, and social contexts. In domestic markets, North Carolina sweetpotatoes have deeply embedded cultural and social contexts as a holiday food and in international markets as an exotic or winter food (though both of these beliefs are changing).

Changes are occurring because actors in the sweetpotato commodity chain recognize the social and cultural contexts and actively try to shape them in order to increase the consumption of sweetpotatoes. Sweetpotato farmers in North Carolina are often, but not always, current or former tobacco farmers. As one grower-packer-shipper stated, "Sweetpotato farmers are about the most—well, they're the next thing to a tobacco farmer and they're the most vocal" in policy decisions that the agricultural sector. Individuals within the sweetpotato industry hold at least some political clout, either through their donations or participation in political campaigns (solely for reasons to benefit the sweetpotato industry). The sweetpotato industry, through agencies or organizations involved with sweetpotatoes, also participate in politics to the benefit of the sweetpotato industry. Supply and demand, market considerations, and price may drive the production of sweetpotatoes, but the political, social, and cultural contexts play a significant role in the consumption of the sweetpotato.

Because this study examines a specific locality (North Carolina) as it relates to globalization, literature concerning the global-local connection is very relevant to understanding the processes at work in the sweetpotato industry of North Carolina. Labor is particularly impacted by the global-local connection, because workers in the agri-food sector often sees wages stagnate or decrease as costs are decreased in order for sellers of sweetpotatoes to seek more profits and buyers of sweetpotatoes to seek cheaper goods.

Global food standards also impact local communities as farming operations, in this case those that sell sweetpotatoes, seek to expand into the global market. Global retailers and private organizations created food quality standards that sellers must pass and gain certification in order to export to certain retailers. These retailers and private organizations claim that these food standards are needed so consumers know that they are purchasing foods that, despite where the food was grown, adhere to good agricultural practices as defined by the retailers and organizations. This in turn results in control over a commodity chain, as Freidberg (2004) suggested.

Farming operations within the United States and other "developed" countries probably have more access than other countries to the technology needed to adhere to these food quality standards. However, within the sweetpotato industry there are operations that cannot afford the technology needed to meet food standards. For example, there are certain fungicides that are not allowed on sweetpotatoes imported into the European Union. These fungicides also happen to be a "favorite" of certain sweetpotato producers, most likely due to their cheap cost relative to another fungicide that is allowed to be used on produce imported into the EU. Due to the role that food quality standards have in North Carolina's sweetpotato industry, particularly the export

side of it, Freidberg's (2004) and Dolan and Humphrey's (2004) studies on the power of food quality standards are important contributions to this study.

This study used commodity chain analysis (CCA) as the methodology and framework. In order to complete a CCA, I used several methods to gather information and construct the sweetpotato commodity chain. These methods are explored in the next section.

1.4 Qualitative Methods

This study seeks to understand the effects of globalization on North Carolina's sweetpotato industry, but how should the effects of globalization be measured? Here, globalization is measured using qualitative methods, specifically interviews with participants in the North Carolina sweetpotato industry. Dunn (2005: 80) writes that interviewing is used for four main reasons: to provide information that otherwise cannot be obtained from other sources; to explore complexities and motivations in behavior; "to collect a diversity of meaning, opinion, and experiences;" and to show respect for and provide empowerment to the participants who are providing data to the researcher. By conducting interviews with several actors in the sweetpotato commodity chain (SPCC), I am able to show the different experiences that actors have in the same commodity chain.

Interviewing documented first-hand experiences from the perspective of several actors as well as data on the SPCC. Interviews are important because they "are sensitive and people-oriented, allowing interviewees to construct their own accounts of their experiences by describing and explaining" (Valentine, 2005: 110) their roles within the sweetpotato commodity chain. This data supplemented the numerical data collected on sweetpotato. It helped explain changes in the SPCC that numbers alone could not explain.

The interviews were conducted with 19 individuals and were recorded using a digital recorder. This included eight growers-shippers-packers; two employees of farming operations; four produce companies; three individuals at North Carolina State University; one individual with the NCDA International Trade Office (ITO), and one individual with the North Carolina Sweetpotato Commission. Often, many of these individuals' operations are vertically integrated in the sweetpotato commodity chain.

Interview questions were divided into three categories: production and operation; marketing; and the role of the North Carolina Sweetpotato Commission and North Carolina State University. Questions under the production and operation category investigated a number of aspects concerning the operation (whether a farm or a produce company), including: activities that the operation is involved in (farming, packing, shipping, processing) crops grown, size of farm, acreage devoted to sweetpotatoes, varieties of sweetpotato grown, percentage of sweetpotatoes sent to fresh market and processors, whether sweetpotato acreage has changed and factors that determine acreage devoted to sweetpotatoes, and other questions regarding the nature of the operation. Since one produce company did not grow any crops, questions concerning acreage and size were changed to how many pounds of sweetpotatoes were bought and the number of growers the company bought sweetpotatoes from.

Marketing questions included, but were not limited to: how marketing has changed from the time the operation first sold sweetpotatoes, strategies used in selling sweetpotatoes, how sweetpotatoes were sold (contracts or open-market), who were buyers and how buyers influenced the interviewee's operation, market potential for sweetpotatoes, the difference between selling/marketing sweetpotatoes domestically and internationally, and the interviewee's

opinion on the shift in cultural perceptions of sweetpotatoes as a holiday food to an everyday food.

Questions concerning the North Carolina Sweetpotato Commission and North Carolina State University included: advantages and disadvantages of both agencies, whether or not the agencies promote the interests of sweetpotato farmers and packer-shippers, how these agencies have influenced North Carolina's sweetpotato industry, their roles in promoting and marketing sweetpotatoes internationally, and how important the interviewees deemed these organizations to the success of the North Carolina sweetpotato industry both domestically and internationally.

1.4.1 Primary Data Sources. Approximately 45 individuals or companies contacted to participate in this study, including five processors or canneries, one international broker, five retail headquarters, and dozens of growers, packer-shippers, and produce companies. Of these, 19 individuals agreed to be interviewed. Twenty-six of these individuals or companies that were contacted did not participate for several reasons. Individuals at retail locations or processors were not authorized to speak with me. The broker, while initially interested, did not return follow-up calls and e-mails. Other growers and packer-shippers were unable to commit time to be interviewed or felt that since their operations did not export sweetpotatoes to other countries that they would not be useful to this study (despite reassurances that they were still a part of globalization of the SPCC, because they sold to exporters). Because of the small number of participants, compared to the estimated 450 individuals or associates involved in North Carolina's sweetpotato industry (NSCPC, 2010a), this study does not purport to be comprehensive of the entire North Carolina sweetpotato industry. It does strive to shed light on the industry and any effects it may experience from a globalizing world from information provided by key actors in the SPCC.

Since the sweetpotato commodity chain, like other commodity chains, is complex and intricate, the interviews with individuals involved in the SPCC provided insight into North Carolina's sweetpotato industry. There is relatively little sweetpotato data compared to other commodities studied (such as coffee or sugar), and interviewing actors in the SPCC provided data that would have been difficult to obtain otherwise. Throughout the presentation and discussion of the results, quotes and stories from the participants are used to illustrate what is occurring throughout North Carolina's sweetpotato industry and the actions each node in the commodity chain has on actors within nodes and on other nodes of the commodity chain.

The interview questions were open-ended in order to elicit as much information from participants as possible. I also asked many questions that were not planned, as the interviewee would make a statement that I found interesting and I would then ask follow-up questions. While I did guide the conversation, the interviews were conversational. The conversational style of the interview contributed to the interviewees feeling comfortable enough with me in order to divulge information, especially since many questions that I asked about their operations most participants had not been asked before.

Due to the nature of a thesis and limitations on time and money, I selected participants to interview first on the basis of whether they sell internationally. Then I used the "snowballing" method to identify other actors in the SPCC to interview. The "snowballing" method means I used references from participants to gain access to new participants (Valentine, 2005: 117). This was an important tool in gaining access to new participants in this study. While researchers at North Carolina State University and the Executive Director of the North Carolina Sweetpotato Commission were willing to talk to me without a reference, most responses from participants only came after I indicated I was referred to them by someone else in the sweetpotato industry.

1.4.2 Secondary Data Sources. There were several secondary data sources used in this research. Interviewees provided some quantitative data about their individual operations. In addition, data were gathered from the United States Department of Agriculture (USDA), North Carolina Department of Agriculture and Consumer Services (NCDA&CS), United States Sweetpotato Council, and the North Carolina Sweetpotato Commission. These organizations are also a part of the sweetpotato industry and its commodity chain. While no quantitative analysis was performed on data gathered, the data are useful in demonstrating and understanding when and where shifts in sweetpotato production occurred and when the export market began to have a significant presence in the sweetpotato industry. Some tables, graphs, and charts are presented within the body of this study, while others, that provide background to information referenced within the thesis, are located in the appendix.

In addition, because I was unable to interview actors in certain areas of the SPCC, I relied on websites and newspaper articles as needed in order to present a complete picture of the sweetpotato industry and actors within it. Thankfully, many companies now display many aspects of their companies on websites. Some organizations, such as retailers, display the suppliers of their produce. All of this information taken together, along with the qualitative data provided by participants, provides a complete picture of North Carolina's sweetpotato industry, its expansion into international markets, and the effects of globalization on the sweetpotato industry. Let us first turn to the global sweetpotato economy and how North Carolina fits into it.

1.5 Organization of Thesis

This thesis is organized into several chapters. Chapter Two discusses the global sweetpotato economy and how the United States and North Carolina fit into it. Chapter Three describes the sweetpotato commodity chain. Chapter Four discusses the globalization of the

North Carolina sweetpotato industry. Chapter Five examines the role of various state agencies or organizations that are involved in the SPCC. In the final chapter, conclusions are drawn and suggested areas for further research are discussed.

CHAPTER TWO: THE GLOBAL SWEETPOTATO ECONOMY AND NORTH CAROLINA

In this chapter, I discuss the global sweetpotato economy and how the United States and North Carolina fit in it. Before delving into this, let us first look at the botanical history of the sweetpotato. It is not possible to begin at the beginning with sweetpotatoes, in the sense that researchers are unsure of exactly where and when the sweetpotato first developed. According to O'Brien (1972), who wrote about the sweet potato in the early 1970s, archaeological, historical, and linguistics studies are the dominant methods used to determine the origin of the sweetpotato. Those methods, in an effort to determine when the sweet potato was domesticated, gave ranges of time spanning thousands of years. O'Brien (1972) hypothesized the date of domestication of the sweetpotato, its scientific name *Ipomoea batatas*, around 2,500 B.C., in either Central or South America. The sweetpotato was widely established throughout the American continents by the time the Europeans first arrived in the Americas (O'Brien, 1972: 342). An interesting fact about *I. batatas* is that it is a cultigen, which means it is solely a domesticated plant, not found in the wild, and its direct ancestor is unknown (Woolfe, 1992: 1).

When the sweetpotato arrived in North Carolina is unclear. O'Brien (1972: 346) indicates that the sweetpotato may have been cultivated in Virginia as early as 1610. The North Carolina's sweetpotato growers' association, the North Carolina Sweetpotato Commission, reports on its website that sweetpotatoes were found growing in Louisiana by a Spanish explorer in 1543 and in the Carolinas prior to European colonization (Wrench, 2005). At the very least, Thomas Jefferson wrote about sweetpotatoes in 1781 and others had written about sweetpotatoes for at least two decades prior to Jefferson (O'Brien, 1972:346). The sweetpotato is a New World vegetable, but it has spread across the globe through trade, as I will discuss in the next section on the global sweetpotato economy.

2.1 The Global Sweetpotato Economy

Most of the world's sweetpotatoes are grown in "developing" countries. This is reflected in the current literature on sweetpotatoes, which focus almost exclusively on the use of sweetpotatoes as a subsistence crop in these "developing" countries. There are efforts in many "developing" countries, particularly on the African continent, to grow orange-fleshed sweetpotatoes as a means of combating vitamin A-deficiency in the populations of those countries (Woolfe, 1992; SASHA). China, arguably a "developing" country, is the largest producer of sweetpotatoes, growing 75% of the world's sweetpotatoes as of 2008. However, as Figure 1 demonstrates, China's production has decreased from 85% of the world's sweetpotatoes in 1989 to 75% in 2008. While China produces 75% of the sweetpotato grown globally, it exports relatively few sweetpotatoes. Table 1 displays the top 20 producing, exporting, and importing countries of sweetpotatoes.[3] Interestingly, out of the top 20 countries that produce sweetpotatoes, only five of them are in the top 20 exporting countries by volume of sweetpotatoes (USDA, 2011).

Within the global sweetpotato economy, the United States is ranked 12th out of 117 countries and territories as of 2009 in the production of sweetpotatoes (USDA, 2011). However, the USA is ranked number one in sweetpotato exporting countries, with China as a distant number two. China's use of sweetpotatoes is different than the United States' use of sweetpotatoes. The Chinese only consume about a quarter of their sweetpotatoes, very little of which is exported, while the remaining sweetpotatoes are used as animal feed (R02, 2011). This is in contrast to the United States, where approximately 60 to 70 % of sweetpotatoes are used as

[3] The USA is shown in Table 1 as one of the top ten sweetpotato importers. However, it only imported 7,600 metric tons in 2008, mostly from the Dominican Republic. The USA, in 2009 and 2010, saw increases in sweetpotato imports, but due mostly to increased imports from China (which grows different varieties than the vast majority of the US).

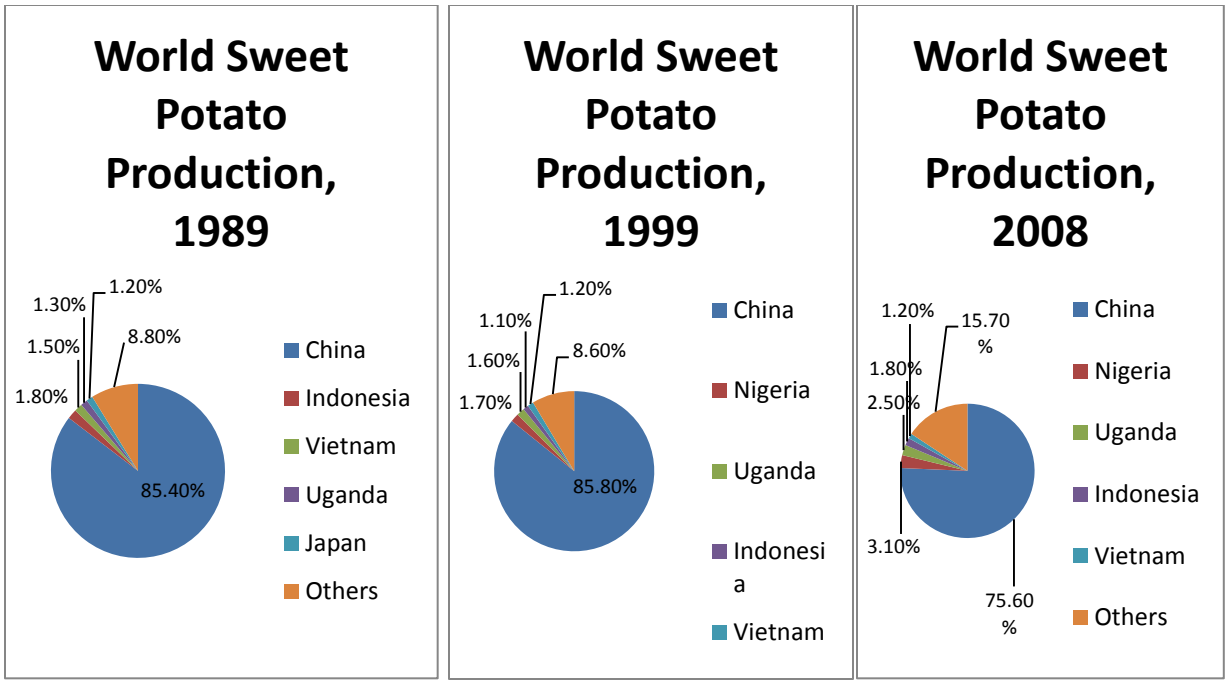

Figure 1. World Sweetpotato Production for 1989, 1999, and 2008. Source: US Sweetpotato Council Statistical Yearbook 2011.

Rank	Top 20 Producers (by metric tons)	Top 20 Exporters (by metric tons)	Top 20 Importers (by metric tons)
1	China	USA	United Kingdom
2	Nigeria	China	Canada
3	Uganda	Dominican Republic	Japan
4	Indonesia	Israel	France
5	Vietnam	Indonesia	Albania
6	Tanzania	France	Netherlands
7	India	United Arab Emirates	United States of America
8	Japan	Honduras	Singapore
9	Kenya	Egypt	Thailand
10	Madagascar	Brazil	Malaysia
11	Mozambique	Netherlands	Italy
12	Burundi	Occupied Palestinian Territory	Saudi Arabia
13	USA	Germany	China, Hong Kong SAR
14	Rwanda	South Africa	Mexico
15	Angola	Italy	Uruguay
16	Papua New Guinea	Malaysia	Jordan
17	Philippines	Saint Vincent and the Grenadines	Germany
18	Brazil	Jamaica	Spain
19	Ethipia	India	Trinidad and Tobago
20	Korea, Democratic People's Rep.	Belgium	Lebanon

Table 1. Top 20 sweetpotato producing, exporting, and importing countries of sweetpotatoes, 2008. Source: USDA, 2011.

table stock (retail, restaurants, foodservice). The remainder is used in processing, with very few sweetpotatoes grown solely for use as animal feed (there are sweetpotatoes designated as "rot"—not fit for human consumption—and are sold as animal feed, but this is not the preferred method of selling sweetpotatoes).

Perhaps the most intriguing aspect of the sweetpotato export data gathered is the inexplicable decline of Chinese sweetpotato exports. This is seen in Figure 2, which displays the sweetpotato export data for the years 1970 to 2008 from the top 11 (out of 128 countries and territories that sweetpotato export data were gathered from) sweetpotato exporting countries. Chinese sweetpotato exports peaked in 1991 with over 750,000 metric tons of sweetpotatoes exported that year. By 2008, sweetpotato exports from China had declined significantly to just under 25,000 metric tons. Despite extensive research to find the exact reasons why this dramatic decline occurred, I can only hazard a guess. Over time, the population increased, resulting in an increase in the demand for food products, particularly meat. As already mentioned, the sweetpotato is used predominantly for livestock feed in China. As the Chinese population increased, demand for meat probably increased as well. This, in turn, required more sweetpotatoes for animal feed instead of for sweetpotato exports to other countries.

China is not the only high sweetpotato producing country that exports a small amount of sweetpotatoes relative to the amount of sweetpotatoes harvested. For example, Uganda and Nigeria, ranked second and third respectively in world sweetpotato production, each produced about 2.7 million metric tons of sweetpotatoes (USDA, 2011). However, in 2008, Nigeria exported only 313 metric tons, while Uganda exported even less, two metric tons (USDA, 2011).

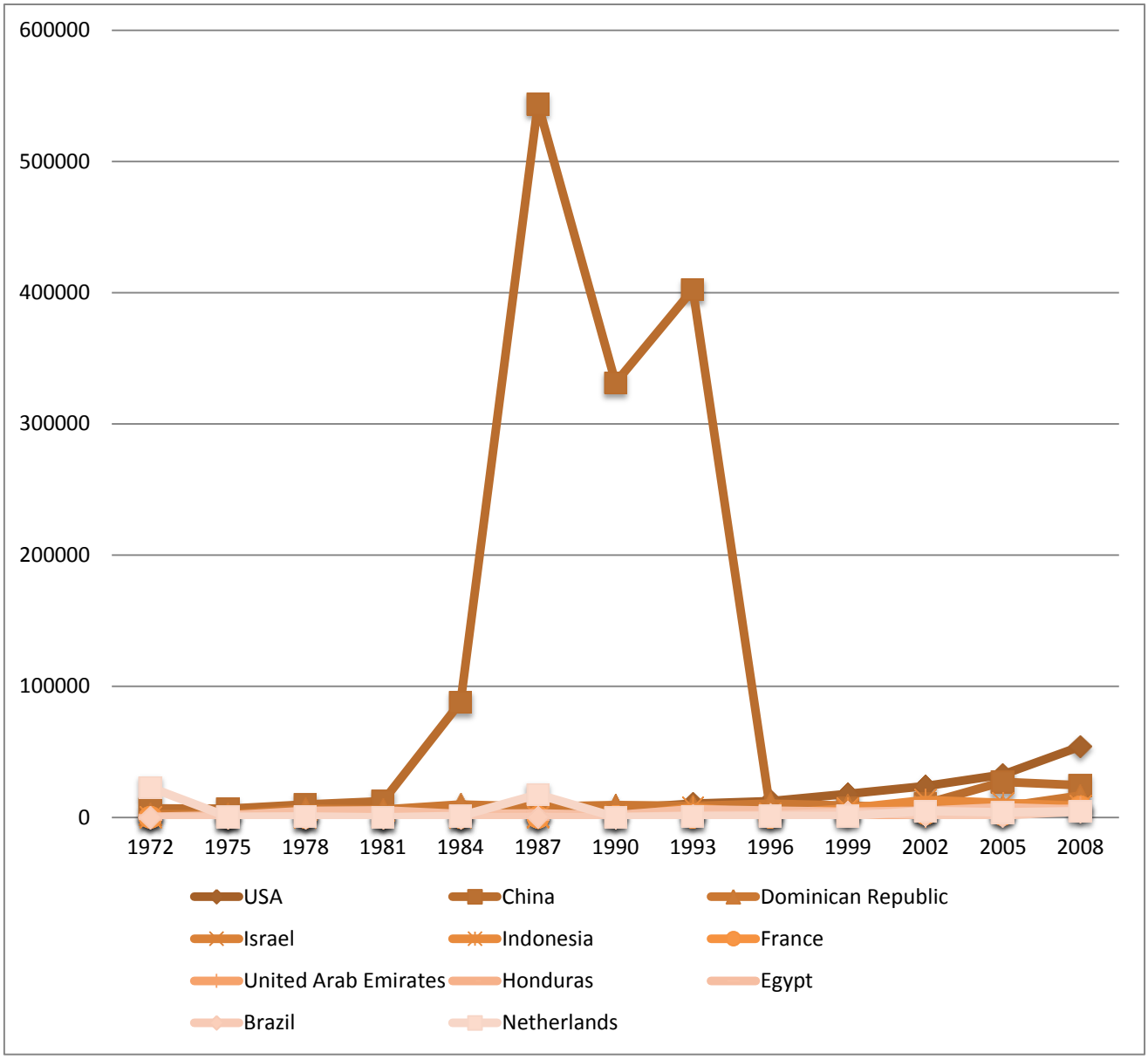

Figure 2. Sweetpotato exports for the top 11 sweetpotato exporting countries, 1970-2008, in metric tons. Source: USDA, 2011, Table 40.

Table 2 displays data from seven of the top 10 sweetpotato exporting countries. These data show which countries are importing the sweetpotatoes and the value of those sweetpotatoes. Five of these countries—China, Israel, France, Honduras, and Egypt—each export sweetpotatoes to at least one of the United States' top six recipient countries of sweetpotatoes (which are seen in Table 3). However, as of 2008, the United States exported more sweetpotatoes to its top six recipients than other sweetpotato exporting countries. The data presented in Table 3 demonstrate the aggressive tact United States' sweetpotato exporters have taken. In one two-year period, 2006 to 2008, US sweetpotato exported increased by 8,215 metric tons. The next two-year period, 2008-2010, saw an increase of 37,716 metric tons of sweetpotatoes exported from the United States, almost five times the increase seen between 2006 and 2008.

Each country exports to several countries, often based on the geographic distance between the exporting country and the importing country. Many of the same countries appear on the top five or six recipients of most of the sweetpotato exporting countries. These importing countries include: Canada (importing from the USA, China, and Honduras), the United Kingdom (importing from USA, Israel, France, Honduras, and Egypt), the Netherlands (importing from USA, China, Israel, France, Honduras, and Egypt), Spain (importing from USA, France, and Honduras), Japan (importing from China and Indonesia), the Republic of Korea (importing from China and Indonesia), Germany (importing from Israel and France), and the USA (importing from China and Honduras). Table 2 also shows the varied amounts of sweetpotatoes imported from various countries.

While sweetpotatoes are exported to many countries, total amounts exported to these countries range from a few dozen metric tons to tens of thousands metric tons. The USA exported over 50,000 metric tons of sweetpotatoes in 2008, with the 2nd leading exporter, China,

EXPORTING COUNTRY: U.S.A.										
	2006		2007		2008		2009		2010	
Recipient Country	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%
Canada	23,486	52.3	22,025	51.0	24,620	46.3	33,027	49.7	51,178	56.3
United Kingdom	17,301	38.5	17,082	39.5	22,363	42.1	27,225	41.0	32,771	36.1
Netherlands	1,672	3.7	2,013	4.7	2,318	4.4	3,761	5.7	3,997	4.4
Mexico	844	1.9	836	1.9	1,551	2.9	1,078	1.6	1,551	1.7
Belgium-Luxembourg	841	1.9	79	0.2	954	1.8	76	0.1	184	0.2
Spain	252	0.6	140	0.3	673	1.3	523	0.8	376	0.4
Subtotal	*44,397*	*98.8*	*42,176*	*97.6*	*52,479*	*98.7*	*65,689*	*98.8*	*90,056*	*99.1*
Others	531	1.2	1,030	2.4	664	1.3	770	1.2	803	0.9
TOTAL Exports	44,928	100	43,205	100	53,143	100	66,458	100	90,859	100

EXPORTING COUNTRY: CHINA (People's Republic of)										
	2004		2005		2006		2007		2008	
Recipient Country	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%
Japan	23,937	87.9	21,790	80.5	19,197	87.1	12,305	76.7	17,008	69.5
Hong Kong	78	0.3	90	0.3	70	0.3	118	0.7	1,879	7.7
Netherlands	238	0.9	334	1.2	727	3.3	1,574	9.8	1,520	6.2
Korea, Republic of	1,898	7.0	3,785	14.0	896	4.1	1,090	6.8	1,361	5.6
United States	731	2.7	503	1.9	37	0.2	21	0.1	202	0.8
Canada	124	0.5	267	1.0	255	1.2	77	0.5	56	0.2
Subtotal	*27,006*	*99.2*	*26,769*	*98.9*	*21,182*	*96.1*	*15,185*	*94.7*	*22,026*	*90.0*
Others	238	0.9	158	0.6	158	0.7	158	1.0	158	0.6
TOTAL Exports	27,218	100	27,063	100	22,036	100	16,035	100	24,460	100

EXPORTING COUNTRY: Israel										
	2004		2005		2006		2007		2008	
Recipient Country	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%
United Kingdom	4,034	30.2	5,604	51.2	7,209	49.7	6,676	54.1	4,291	47.4
France	6,576	49.2	2,642	24.1	3,574	24.6	1,979	16.0	1,627	18.0
Netherlands	752	5.6	798	7.3	1,597	11.0	1,045	8.5	486	5.4
Germany	448	3.4	525	4.8	501	3.5	697	5.6	773	8.5
Finland	210	1.6	203	1.9	349	2.4	611	5.0	727	8.0
Subtotal	*12,020*	*89.9*	*9,772*	*89.2*	*13,230*	*91.2*	*11,008*	*89.2*	*7,904*	*87.3*
Others	1,348	10.1	1,183	10.8	1,272	8.8	1,335	10.8	1,145	12.7
TOTAL Exports	13,368	100	10,955	100	14,502	100	12,343	100	9,049	100

EXPORTING COUNTRY: Indonesia										
	2004		2005		2006		2007		2008	
Recipient Country	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%
Malaysia	6,238	52.8	4,568	41.1	2,953	26.3	2,677	31.9	2,354	27.9
Japan	2,557	21.6	4,166	37.5	5,064	45.1	2,930	34.9	3,595	42.6
Singapore	2,903	24.6	2,221	20.0	2,075	18.5	1,157	13.8	1,290	15.3
Korea, Republic of	108	-	158	1.4	1,114	9.9	1,605	19.1	120	14.2
China	-	-	-	-	-	-	20	0.2	-	-
Subtotal	*11,806*	*99.9*	*11,113*	*100.0*	*11,206*	*99.8*	*8,389*	*100.0*	*8,442*	*100.0*
Others	16	0.1	-	0.0	10	0.2	-	-	1	0.0
TOTAL Exports	11,822	100	11,113	100	11,216	100	8,389	100	8,443	100

EXPORTING COUNTRY: France										
	2004		2005		2006		2007		2008	
Recipient Country	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%
United Kingdom	440	29.4	1,083	40.4	2,557	44.5	6,262	61.9	4,467	58.1
Netherlands	265	17.7	640	23.9	1,535	26.7	1,907	18.9	1,568	20.4
Germany	92	6.1	251	9.4	454	7.9	726	7.2	829	10.8
Spain	465	31.1	430	16.1	503	8.8	658	6.5	221	2.9
Italy	26	1.7	86	3.2	162	2.8	162	1.6	211	2.7
Subtotal	*1,288*	*86.0*	*2,490*	*92.9*	*5,211*	*90.7*	*9,715*	*96.1*	*7,296*	*94.9*
Others	209	14.0	189	7.1	536	9.3	396	3.9	391	5.1
TOTAL Exports	1,497	100	2,679	100	5,747	100	10,111	100	7,687	100

Exporting Country: Honduras												
	2004		2005		2006		2007		2008		2009	
Recipient Country	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%
United Kingdom	-	-	288	19.5	1469	45.2	3366	62.2	4711	72.7	2832	59.0
Netherlands	325	39.4	459	31.1	616	18.9	655	12.1	795	12.3	810	16.9
United States	351	42.5	623	42.2	987	30.3	1184	21.9	866	13.4	479	10.0
France	-	-	18	1.2	-	-	17	0.3	54	0.8	324	6.8
Canada	21	2.5	-	-	36	1.1	-	-	-	-	185	3.9
Costa Rica	53	6.4	34	2.3	19	0.6	39	0.7	-	-	110	2.3
Subtotal	*750*	*90.9*	*1422*	*96.4*	*3127*	*96.1*	*5261*	*97.2*	*6426*	*99.2*	*4740*	*98.8*
Others	75	9.1	53	3.6	126	3.9	150	2.8	50	0.8	56	1.2
Total Exports	825	100.0	1475	100.0	3253	100.0	5411	100.0	6476	100.0	4796	100.0

Exporting Country: Egypt												
	2004		2005		2006		2007		2008		2009	
Recipient Country	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%
Saudia Arabia	320	2.9	737	9.6	663	14.2	996	13.9	-	-	3241	34.6
Jordan	1330	12.1	1667	21.7	1250	26.8	911	12.8	-	-	1497	16.0
Lebanon	1298	11.8	525	6.8	819	17.6	909	12.7	-	-	1248	13.3
Netherlands	109	1.0	261	3.4	178	3.8	267	3.7	-	-	789	8.4
United Arab Emirates	14	0.1	74	1.0	123	2.6	903	12.6	-	-	676	7.2
United Kingdom	1093	9.9	632	8.2	312	6.7	582	8.1	-	-	500	5.3
Spain	728	6.6	299	3.9	397	8.5	605	8.5	-	-	308	3.3
Subtotal	*4892*	*44.4*	*4195*	*54.7*	*3742*	*80.2*	*5173*	*72.4*	-	-	*8259*	*88.1*
Others	6120	1743.6	3477	45.3	922	19.8	1970	27.6	-	-	1120	11.9
Total Exports	11012	100.0	7672	100.0	4664	100.0	7143	100.0	-	-	9379	100.0

Table 2. Sweetpotato exports from various countries, their recipients, and quantity exported (in metric tons), 2004-2008. Source: United States Sweetpotato Council Statistical Yearbook, 2011; FAO.

exporting half that amount in the same year. This demonstrates that the US is far ahead of other countries in exporting sweetpotatoes, giving it significant influence on the global sweetpotato market and how it is shaped.

Table 3 displays the top six sweetpotato importing countries as of 2008 along with their supplier countries. Two of the top six sweetpotato importing countries receive more than 50% of their sweetpotatoes from the United States: the United Kingdom with 55% of its imported sweetpotatoes from the US, and Canada, importing almost all of its sweetpotatoes from the US. The Netherlands received a quarter of its imported sweetpotatoes from the US. France does receive a small number of its sweetpotatoes from the United States, but almost three-quarters are imported from Israel.

One note must be made about the Netherlands as an importer of sweetpotatoes. According to one participant in this study from NCDA&CS, an estimated 80 to 90% of sweetpotatoes imported into the Netherlands are sold to other European countries, including Spain, Germany, and France (McIver, 2011). This means that while sweetpotato packer-shippers from the United States and other sweetpotato exporting countries,do not export directly to many European countries, in fact their sweetpotatoes do eventually end up in numerous countries. Now that we have examined the global sweetpotato economy, let's turn to how the United States fits into the global sweetpotato economy.

2.2 The United States within the Global Sweetpotato Economy

The United States, as already mentioned, is ranked 12th out of 117 countries in sweetpotato production, as of 2009. Despite its low production of sweetpotatoes relative to high-ranking countries, the United States is the leading sweetpotato exporter. It is ranked first out of 128 countries and territories who currently or in the past exported sweetpotatoes.

IMPORTING COUNTRY: UNITED KINGDOM

	2004		2005		2006		2007		2008	
Supplier Country	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%
United States	8,539	55.4	13,885	54.7	17,439	49.7	17,021	45.9	22,383	54.9
France	711	4.6	1,466	5.8	2,683	7.6	6,690	18.1	4,691	11.5
Israel	3,482	22.6	6,101	24.0	9,932	28.3	5,524	14.9	5,240	12.9
Honduras	-	-	401	*1.6*	1,455	*4.1*	3,863	*10.4*	4,742	*11.6*
Egypt	997	6.5	875	3.4	783	2.2	1,140	3.1	701	1.7
Subtotal	*13,729*	*89.0*	*22,728*	*89.5*	*32,292*	*91.9*	*34,238*	*92.4*	*37,757*	*92.7*
Others	1,697	11.0	2,654	10.5	2,830	8.1	2,817	7.6	2,986	7.3
Total Imports	15,426	100.0	25,382	100.0	35,122	100.0	37,055	100.0	40,743	100.0

IMPORTING COUNTRY: CANADA

	2004		2005		2006		2007		2008	
Supplier Country	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%
United States	33,050	93.4	22,436	88.6	23,218	87.4	21,567	86.6	24,095	86.0
China	275	0.8	554	2.2	824	3.1	988	4.0	928	3.3
Honduras	309	0.9	673	2.7	834	3.1	682	2.7	882	3.1
Jamaica	807	2.3	559	2.2	692	2.6	592	2.4	692	2.5
Costa Rica	392	1.1	437	1.7	360	1.4	548	2.2	604	2.2
Subtotal	*34,833*	*98.5*	*24,659*	*97.4*	*25,928*	*97.7*	*24,377*	*97.9*	*27,201*	*97.1*
Others	238	0.7	656	2.6	632	2.3	534	2.1	822	2.9
Total Imports	35,373	100.0	25,315	100.0	26,560	100.0	24,911	100.0	28,023	100.0

IMPORTING COUNTRY: JAPAN

	2004		2005		2006		2007		2008	
Supplier Country	Quantity	%	Quantity	%		%	Quantity	%	Quantity	%
China	8,689	96.5	13,511	97.3	14,862	91.6	13,012	89.3	15,020	90.5
Vietnam	198	2.2	276	2.0	1,029	6.3	1,020	7.0	1,328	8.0
Indonesia	73	0.8	102	0.7	338	2.1	538	3.7	248	1.5
Brazil	2	0.0	3	0.0	2	0.0	3	0.0	-	-
Thailand	39	0.4	-	-	-	-	-	-	-	-
Subtotal	*9,001*	*100.0*	*13,892*	*100.0*	*16,231*	*100.0*	*14,573*	*100.0*	*16,596*	*100.0*
Others	1	0.0	-	-	1	0.0	-	0.0	-	0.0
Total Imports	9002	100.0	13892	100.0	16232	100.0	14573	100.0	16596	100.0

IMPORTING COUNTRY: FRANCE

	2004		2005		2006		2007		2008	
Supplier Country	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%
Israel	5,162	67.0	5,110	65.5	6,765	71.1	12,562	80	10,972	77.5
Egypt	796	10.3	763	9.8	771	8.1	724	4.6	708	5.0
Netherlands	557	7.2	838	10.7	890	9.4	927	5.9	656	4.6
United Kingdom	89	1.2	85	1.1	38	0.4	194	1.2	545	3.9
Spain	193	2.5	202	2.6	207	2.2	422	2.7	349	2.5
United States	-	-	-	-	-	-	17	0.1	57	0.4
Subtotal	*6,797*	*88.2*	*6,998*	*89.7*	*8,671*	*91.2*	*14,829*	*94.8*	*13,230*	*93.5*
Others	907	11.8	806	10.3	840	8.8	821	5.2	920	6.5
Total Imports	7,704	100.0	7,804	100.0	9,511	100.0	15,650	100.0	14,150	100.0

IMPORTING COUNTRY: ALBANIA

	2004		2005		2006		2007		2008	
Supplier Country	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%
Serbia	-	-	-	-	7,597	90.0	12,605	99.2	11,654	100.0
Macedonia	-	-	17	0.7	16	0.2	96	0.8	3	0.0
Egypt	-	-	-	-	803	9.5	-	-	-	-
Italy	15	0.5	1	0.0	24	0.3	-	-	-	-
Greece	216	7.7	2	0.1	3	0.0	-	-	-	-
Subtotal	*231*	*8.3*	*20*	*0.8*	*8,443*	*100.0*	*12,701*	*100.0*	*11,657*	*100.0*
Others	2,559	91.7	2,522	99.2	-	-	-	-	-	-
Total Imports	2,790	100.0	2,542	100.0	8,443	100.0	12,701	100.0	11,657	100.0

IMPORTING COUNTRY: NETHERLANDS

	2004		2005		2006		2007		2008	
Supplier Country	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%
United States	757	15.0	1,136	15.4	1,796	18.2	1,621	13.5	2,737	25.2
Israel	1,626	32.3	1,868	25.4	2,007	20.3	2,716	22.6	2,232	20.8
China	243	4.8	353	4.8	400	4.1	1,876	15.6	1,557	14.3
Honduras	361	7.2	371	5.0	660	6.7	805	6.7	964	8.9
South Africa	743	14.8	734	10.0	836	8.5	847	7.1	931	8.6
Subtotal	*3,730*	*74.1*	*4,462*	*60.6*	*5,699*	*57.7*	*7,865*	*65.5*	*8,449*	*77.8*
Others	1,307	25.9	2,898	39.4	4,172	42.3	4,144	34.5	2,406	22.2
Total Imports	5037	100.0	7360	100.0	9871	100.0	12009	100.0	10855	100.0

Table 3. Top six sweetpotato importing countries, their recipients, and quantity (in metric tons) 2004-2008. Source: United States Sweetpotato Council Statistical Yearbook, 2011; FAO, 2011.

Before 1989, sweetpotato exports from the United States were non-existent or so low that they were not reported to the USDA (2011). Even though the US has become the leading exporter in the global sweetpotato, its exports in volume do not approach the volume of sweetpotatoes that China once exported. Today, several states within the United States export sweetpotatoes. This is discussed in detail in a later chapter. The countries that the United States exports sweetpotatoes to are: Canada, United Kingdom, Netherlands, Mexico, Belgium-Luxembourg, and Spain.

Within the United States, sweetpotato production has seen changes since 1900 (see Figure 3) and consumption since 1979 (see Figure 4). By 1960, total US sweetpotato production mostly stayed below 15,000 cwt until 2005. The graph shows starkly the influence NC has on the overall US sweetpotato production. From 1985 to the present, the ups and downs of the US graph line are almost identical to the ups and downs of the NC graph line.

Only since 2005 has sweetpotato production in the United States steadily increased. Almost half of the growth in sweetpotato production from 2005 to 2010 is due to increases in North Carolina's sweetpotato production. Reasons for this increase in sweetpotato production include the United States' increased exports of sweetpotatoes, particularly by North Carolina, and the increase of demand for sweetpotatoes in the processing sector. These drivers are discussed in later chapters, particularly the role of international sweetpotato sales on North Carolina's sweetpotato industry.

It can be said with near certainty that sweetpotato consumption in the United States has drastically changed since the days of the Great Depression. According to several participants in this study, per capita consumption of sweetpotatoes was about 30 pounds at the beginning of the 20th century (F03, 2011; PC04, 2011). In 2008, sweetpotato consumption per capita in the

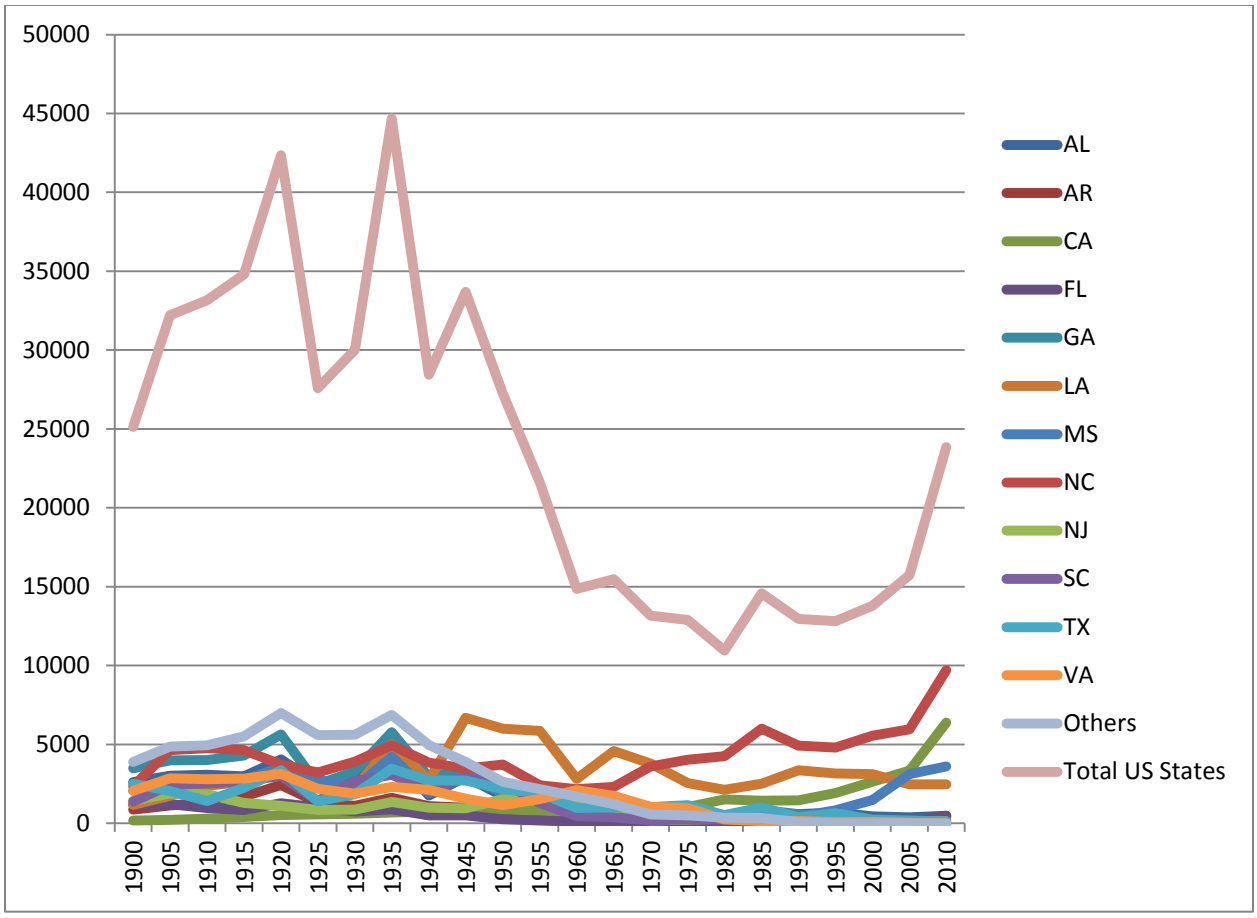

Figure 3. United States sweetpotato production, in 1,000 cwt, 1900-1955. Source: USDA, 2011, Table 2.

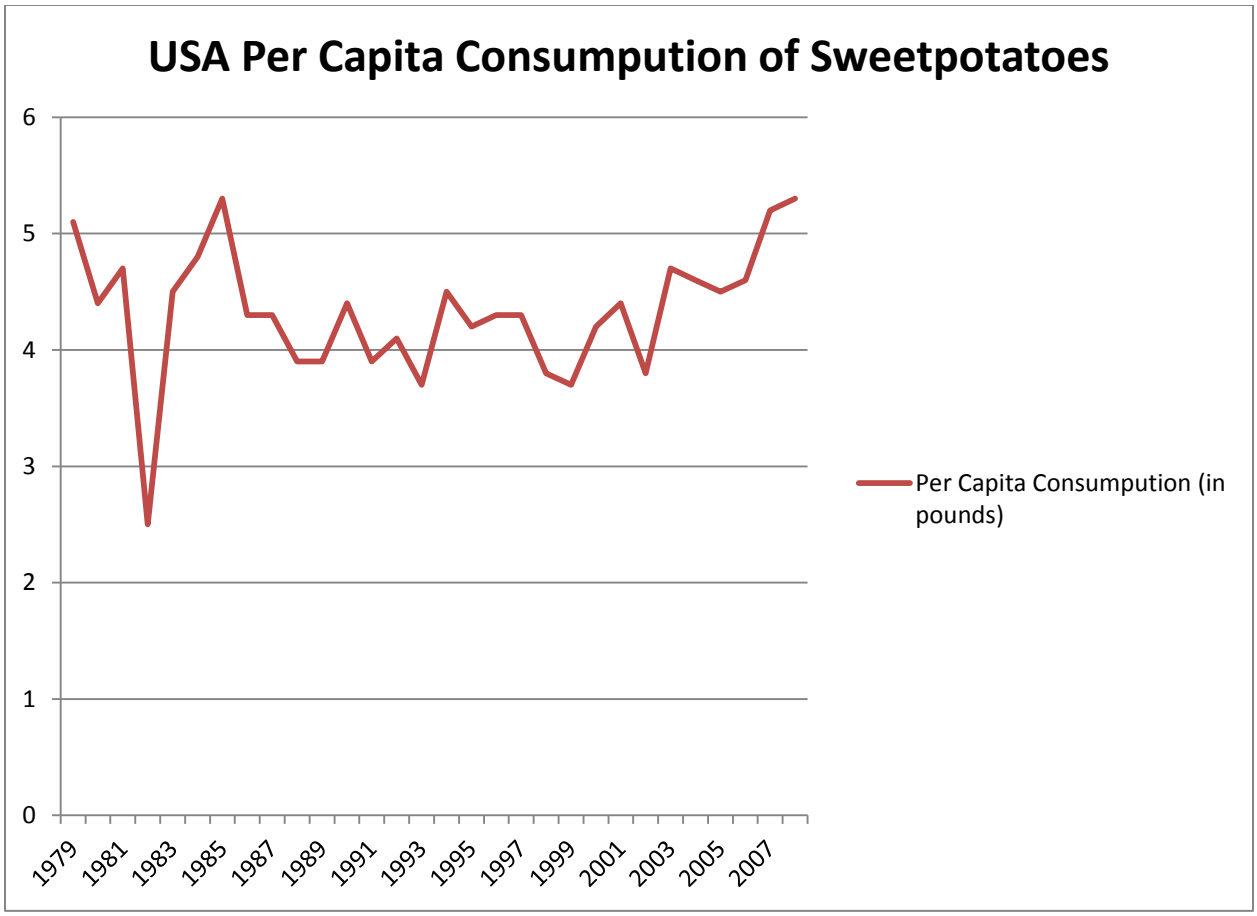

Figure 4. USA Per Capita Consumption of Sweetpotatoes (in pounds). Source: http://www.ers.usda.gov/publications/vgs/2008/05May/VGS2008.pdf

United States was above five pounds (F02, 2011; F03, 2011; PC04, 2011; NCSPC, 2010e). Sweetpotato consumption from 1979 to 2008 was shown in Figure 4. What happened to sweetpotato consumption in the United States to cause such a drastic decrease? I can only hazard guesses based on the time period. The sweetpotato was called a "poor man's crop" by one participant (PC03, 2011) and this perception probably began during the depression, when the sweetpotato was grown heavily, probably in order to combat hunger during the time as it is considered a nutritious and "filling" vegetable.

However, as consumers gained more money, they were able to afford vegetables that were probably not grown by them and were more expensive. At some point, though data do not exist to corroborate this, the sweetpotato was relegated to the holiday table. Only in the past decade has the sweetpotato industry become successful in getting the sweetpotato on plates year-round.

The data presented above demonstrate that the United States is a significant player in the global sweetpotato economy in terms of international trade where it is the leader, much more so than leading sweetpotato producing countries. While the US is ranked low in terms of world production of sweetpotatoes, it is a leader in the international trade of sweetpotatoes. Leading sweetpotato producers, such as China, use sweetpotatoes as a crop for domestic use, unlike the United States which uses sweetpotatoes as a commercial industry and increasingly as an export commodity. A key actor in the United States' growth in sweetpotato exports is North Carolina's sweetpotato industry. Now that we have examined the global sweetpotato economy and the United States' place in it, let us now turn to North Carolina's sweetpotato industry and its role within the global sweetpotato economy.

2.3 North Carolina within the Global Sweetpotato Economy

Before delving into where North Carolina's sweetpotato industry fits within the global sweetpotato economy, it is important to make a comment on scale. North Carolina is a state. Its sweetpotato exports and value of sweetpotato exports may be comparable, or exceed, an entire country's sweetpotato exports, but it is still at a different scale, geographically, than that country. This must be remembered as North Carolina's sweetpotato industry, its role within the global sweetpotato economy, and the effects of globalization on it are examined.

North Carolina produces almost half of the sweetpotatoes in the United States. Sweetpotato acreage harvested by each state as a percentage of total USA sweetpotato acreage from 1991 to 2010 is displayed in Figure 5. This chart demonstrates that while there are several states that grow sweetpotatoes, North Carolina has increased its share while other states have decreased their shares in sweetpotato farming. A geographical representation of these data over time is displayed in Figure 6.

These maps also show which states have left, entered, declined, and flourished in the US's sweetpotato economy. In 2008, North Carolina accounted for 31% of the US sweetpotato exports, for a total dollar amount of US $14, 636,377. An individual state within a country exported more, in dollars, than the world's largest sweetpotato producer.[4]

As of 2010, North Carolina has exported sweetpotatoes to seven different countries. These countries are: United Kingdom, Canada, Netherlands, Belgium, Italy, Ireland, and Spain.

[4] In 2008, China exported USD 9,339,00, which was USD 5,000,000 less than North Carolina (USDA(2011)).

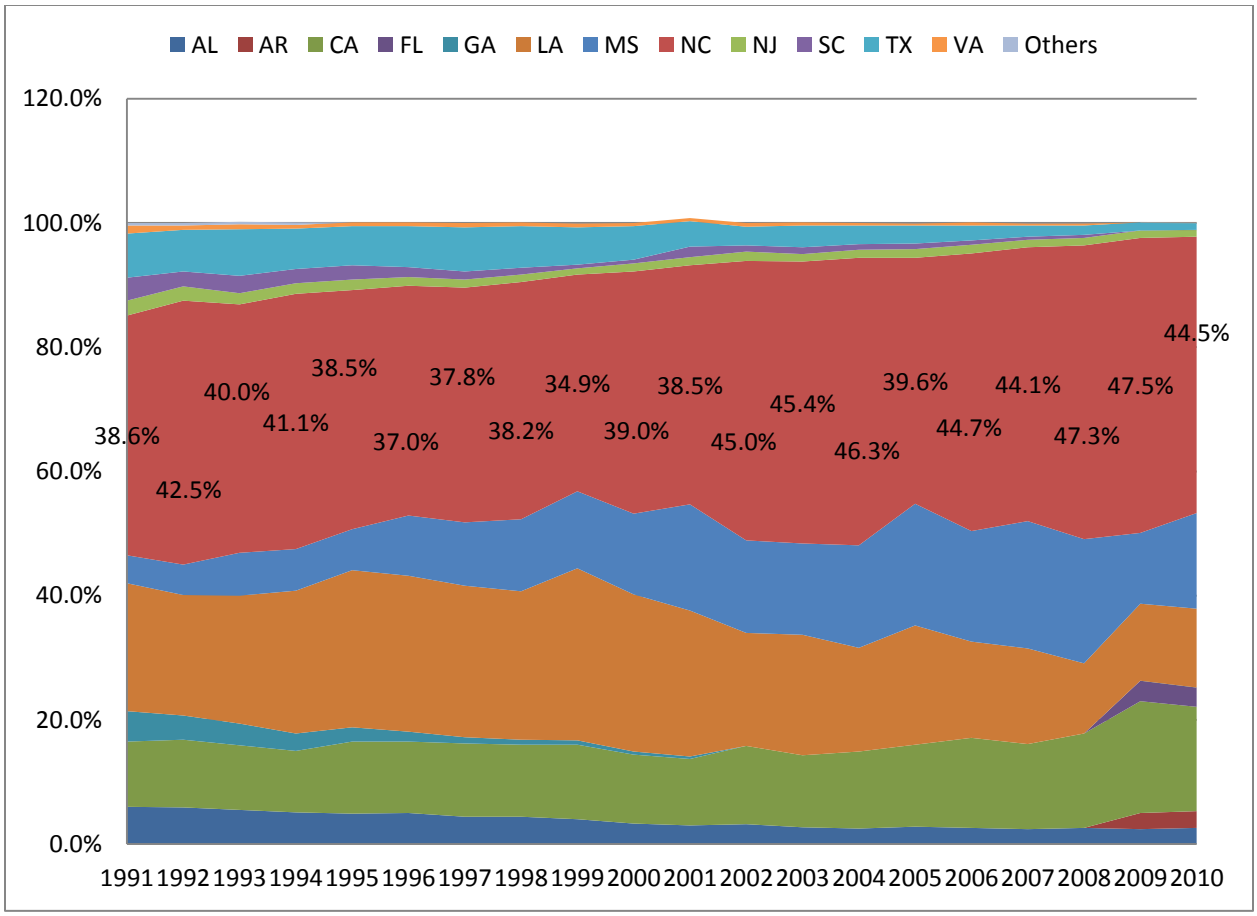

Figure 5. Sweet Potato acreage harvested by state as a percentage of total U.S. acreage, 1991-2010. Percentage from North Carolina is displayed. Source: US Sweetpotato Council Statistical Yearbook 2011.

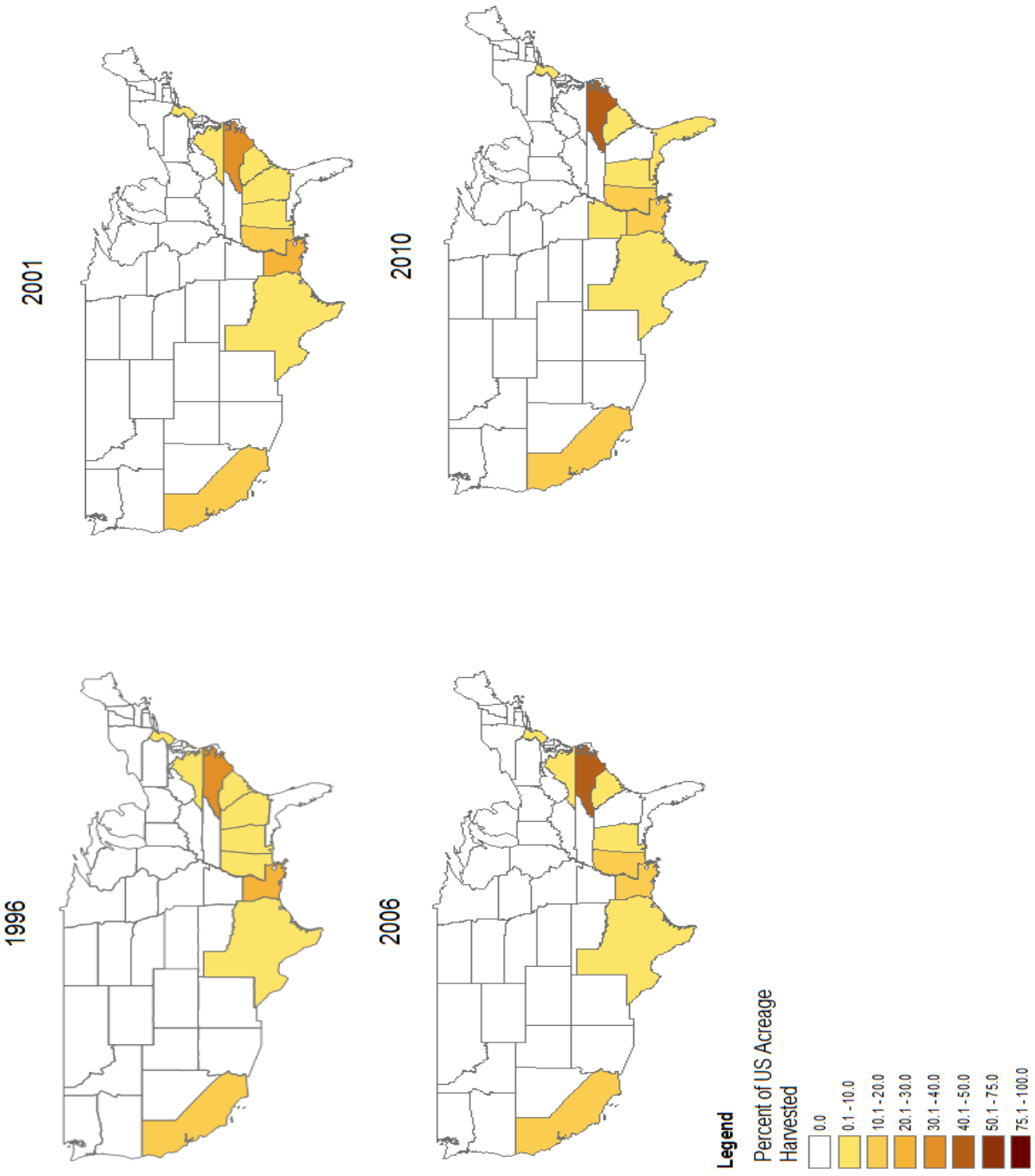

Figure 6. Geographical representation of sweetpotato acreage harvested by state as a percentage of total U.S. acreage, 1991-2010. Percentage from North Carolina is displayed. Source: US Sweetpotato Council Statistical Yearbook 2011.

In the years 1996 to 2009, other countries that sweetpotatoes from North Carolina have been exported to include: Germany, Mexico, Sweden, Greece, and Bulgaria. Participants stated that they exported to the United Kingdom (F01, 2011; F03; 2011; PC01, 2011; PC03, 2011); Netherlands (F01, 2011; PC03, 2011); and Belgium, France and Spain (PC03, 2011). These are the countries that North Carolina exports to, so now I want to show the counties that grow these exported sweetpotatoes.

Sweetpotatoes are grown throughout the state, but the majority of sweetpotato growers are concentrated in the coastal plain region of the state. This is due to the ideal soil and weather conditions needed for growing sweetpotatoes. Sweetpotatoes grown in North Carolina need sandy soil and a particular temperature range, relative humidity, and rainfall in order to reach maximum yield per acre. The geographic distribution of the participants and the leading sweetpotato counties in North Carolina for 2010 is shown in Figure 7, along with an inset of the leading counties in 2008 and 2009.

One look at the map shows that the leading sweetpotato counties from 2008 to 2010 are clustered together in the coastal plain. As one participant, whose operation is located about ten minutes away from I-95 (and forty minutes from the state capital, Raleigh), stated, "You sit right now in the center of 70% of sweetpotatoes grown in the state, right here where you're sitting at in a 50-mile radius. So you're right in the heart" (F03, 2011).

Most of the sweetpotatoes grown within North Carolina are in counties that are along or close to the I-95 corridor, granting the growers-packers-shippers easy access to a major interstate highway and making transportation logistics a little easier. As the map and inset demonstrate, four of the top five sweetpotato producing counties in North Carolina are the same over the three years. Their ranking may change year-to-year, but this is most likely due to crop rotation

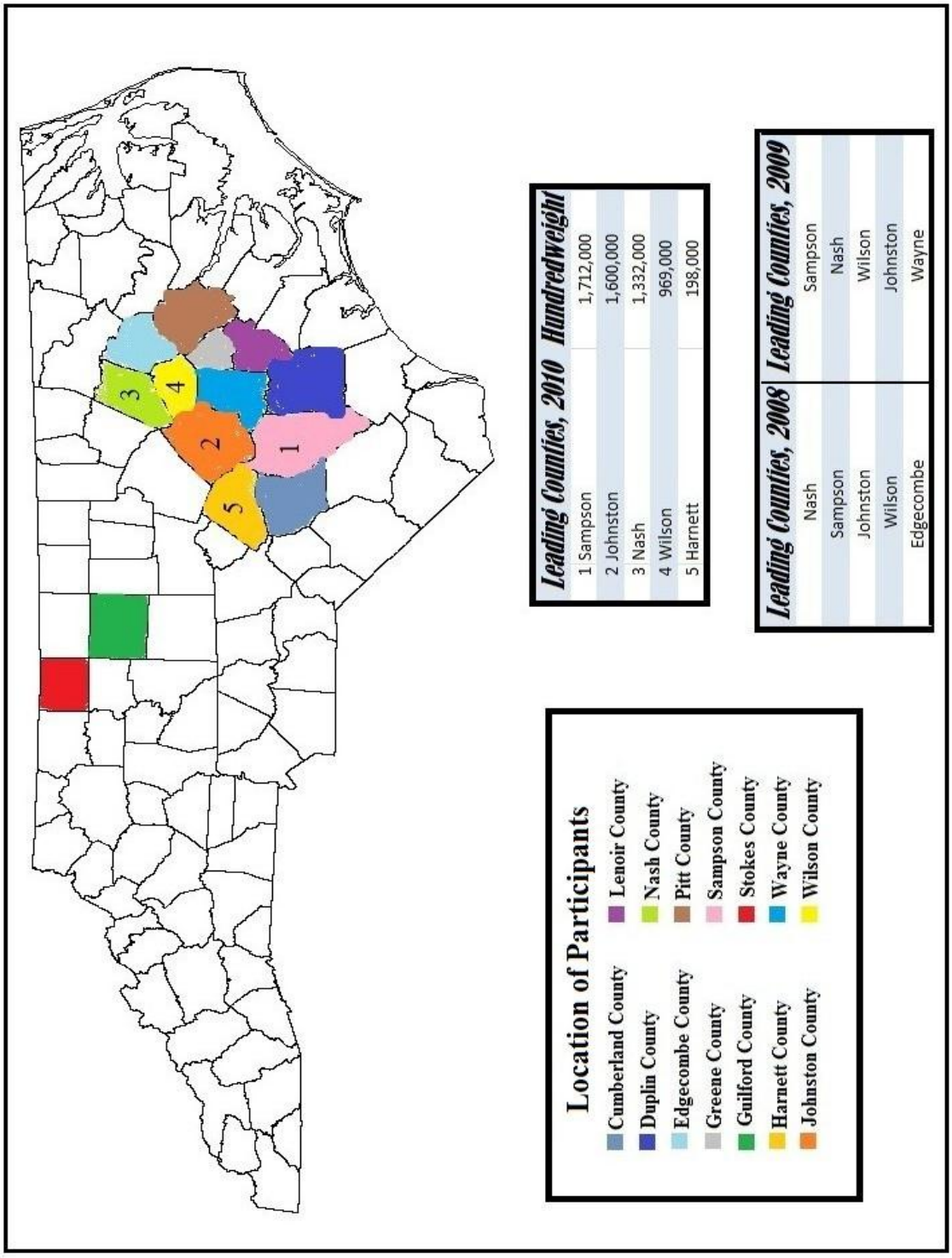

Figure 7. Distribution of participants locations; leading sweetpotato counties in North Carolina, 2008-2010. Sources: Interviews; North Carolina Sweetpotato Commission, (http://www.ncsweetpotatoes.com/component/content/article/180.html); NCDA & CS, 2010 Ag Stat Book; and NCDA & CS, 2011 Ag Stat Book.

practices. Sweetpotatoes are not grown on the same land year after year, but rotated on to different land which can mean a fluctuation in sweetpotato production in these counties over the years. The fifth leading sweetpotato county changed each year, most likely do to crop rotations as well.

Another inset in Figure 7 that shows where participants are located (either based on where they grow sweetpotatoes or where there main offices are located). The locations of the participants are the same counties that regularly constitute the top sweetpotato producing counties, except for Stokes and Guilford counties. The counties represented by the study participants include: Cumberland, Duplin, Edgecombe, Greene, Guildford, Harnett, Johnston, Lenoir, Nash, Pitt, Sampson, Stokes, Wayne, and Wilson Counties. Twelve out of the fourteen counties are geographically located in eastern North Carolina, along the I-95 corridor, while the two other counties are located in the Piedmont region of North Carolina.

2.4 Summary of Findings

Examining the sweetpotato industry from top-down (global to national to local) demonstrates several points about North Carolina and its role in the global sweetpotato economy. Specifically, despite the scale differences between a state and a country, North Carolina exports more sweetpotatoes than other states within the U.S. and other countries. The orange sweetpotato that is seen in many countries is most likely from a North Carolina farm and this gives North Carolina sweetpotato exporters an advantage in the global market as more consumers are familiar with the orange sweetpotato variety. The information presented in this chapter consists of numerical data that shows the global sweetpotato economy today and historically. Using this as a foundation, I am able to show numerically North Carolina's sweetpotato industry within the larger global sweetpotato industry. Despite the United States'

low ranking in the production of sweetpotatoes globally, it is the leader in the sweetpotato export market.

The doubling of exports from 2006-2010 as shown in Table 2, not only demonstrates the aggressiveness of the United States, but that the sweetpotato industry has changed in some aspects in order to accommodate the demands of their European buyers. The exact changes that the US, particularly North Carolina, had to make are discussed in the next chapters. In addition, despite the steadiness US consumption of sweetpotatoes, sweetpotato production has increased. Globalization has allowed growers to continue to increase their acreage devoted to sweetpotatoes, because they now have access to domestic and international buyers.

Within the United States, North Carolina has led the nation in sweetpotato production since 1971, when it claimed the number one spot from Louisiana. California has also become a significant presence in the United States sweetpotato economy and as of 2010 is number two on the sweetpotato production list for the United States. North Carolina produces almost half of the United States sweetpotato supply. As demonstrated by North Carolina's dominance of the global market, even though it is a state within a country competing against other countries, North Carolina has benefited in some ways, and not so much in others, from increasing globalization of the sweetpotato market. North Carolina is clearly striving to be the leading sweetpotato exporter not just at the state level within the United States, but at the global level across all geographic scales.

The data presented in this chapter are very illustrative of the changes in production and dollar values that are occurring in the global sweetpotato economy, at the national level, and at the state level. However, these numbers do not tell the whole story of how globalization has come to impact North Carolina's sweetpotato industry. In order to understand globalization's

effects on NC's sweetpotato industry, we must examine the qualitative data provided by several participants in this study who are actively involved in North Carolina's sweetpotato industry. This is achieved through the construction of the sweetpotato commodity chain, which is depicted and discussed in the next chapter.

CHAPTER THREE: THE SWEETPOTATO COMMODITY CHAIN

In this chapter I present the historical sweetpotato commodity chain of North Carolina—as is best reconstructed from interviews with participants and the sparse information available from that time period—and the present-day sweetpotato commodity chains of North Carolina. These were constructed from the data and interviews presented in the previous chapters. The actors that are involved in the sweetpotato commodity chains are discussed, including how their roles have changed over time and what changes may have occurred due to globalization.

3.1 The Sweetpotato Commodity Chain

The global sweetpotato industry consists of multiple commodity chains, because of how many countries are involved in the global sweetpotato industry. For the United States, there are at least three regions (the Western U.S., the region between the Rockies and the Mississippi River, and the Eastern Seaboard of the U.S.) that each have their own sweetpotato commodity networks. These sweetpotato commodity networks consist of multiple commodity chains that are connected to each other regionally, nationally, and globally.

After conducting interviews with several members involved in North Carolina's sweetpotato industry, I determined that at least two main sweetpotato commodity chains exist within North Carolina. One commodity chain (shown in Figure 8) consists of the "leaders" within North Carolina's sweetpotato industry. By "leaders," I mean the large produce companies and grower-shippers whose revenues are in the high six-figure to eight-figure dollar amounts and are typically located in North Carolina's Coastal Plains region. Most of the participants in this study belong to this dominant, mostly globalized, commodity chain.

The second sweetpotato commodity chain consists of growers of "specialty" sweetpotatoes or small organic growers with only a few dozen sweetpotato acres (Figure 9).

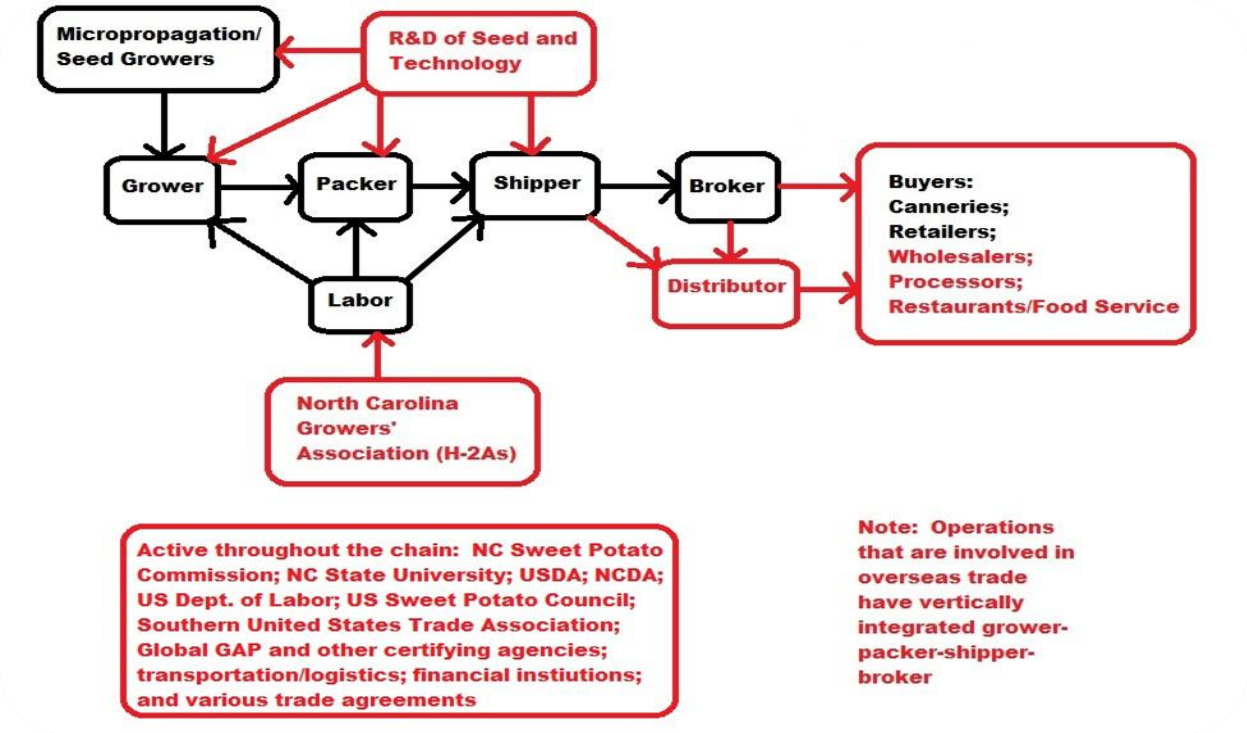

Figure 8. Historical sweetpotato commodity chain in North Carolina is shown in black. The current, main SPCC is the entire image. Own research.

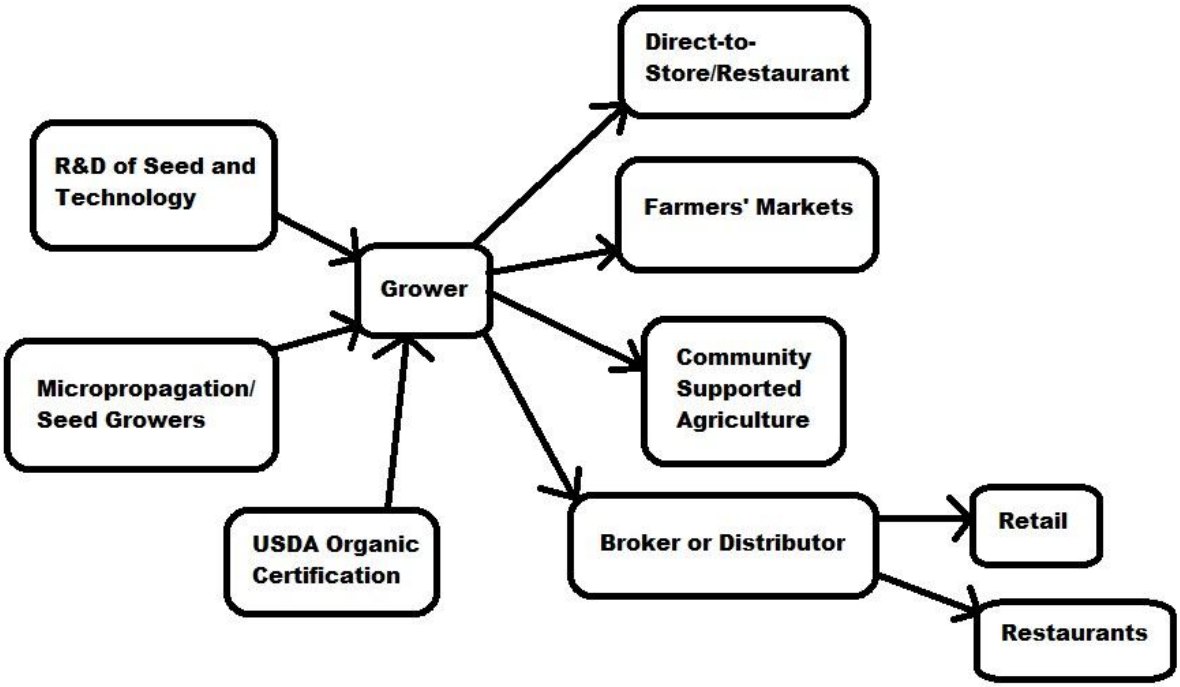

Figure 9. Present-day specialty/organic sweetpotato commodity chain in North Carolina. Own research.

This chain is most likely not globalized, but not because there are no opportunities available to actors within this chain. At least one of the two participants in this commodity chain was contacted by international buyers who were interested in purchasing his sweetpotatoes. However, he was unable to provide the quantity requested and, therefore, unable to enter the international sweetpotato market like participants in the dominant commodity chain can do. There are slightly different actors within this commodity chain and the distance between grower and consumer is much shorter than the distance between grower and consumer in the first commodity chain. In this study I focus on the first chain, because it is more globalized and more data are available for this chain.

The sweetpotato commodity chain depicted in Figure 8 shows the historical sweetpotato commodity chain as well as what the main sweetpotato commodity chain looks like today. The historical SPCC (how the industry was structured as late as the 1950s) is shown in black. The present-day SPCC is the entire figure, both the black boxes and the red boxes. The red boxes signify the actors that were added to the SPCC since the 1950s; several actors, mostly new buyers, were added within the past two decades.

3.2 Actors Along the Sweetpotato Commodity Chain

In order to understand what the commodity chain presents, below is a description of each of the actors.

3.2.1 Micropropogation/Seed Grower. Sweetpotatoes are grown from slips, which are first propagated by seed/slip growers or by the farmers who plant the slips themselves. To be precise, sweetpotatoes are propagated by plant growers into slips, which are shoots off of a mature plant that has been virus-indexed to ensure that the best quality slips are sold to sweetpotato growers. Growers then use the slips to grow sweetpotatoes.

3.2.2 Research and Development. Research and development actors are typically within the academic arena and include researchers involved in storage techniques for sweetpotatoes, horticultural aspects of growing sweetpotatoes, and breeding different varieties of sweetpotatoes. These actors involved in R&D of the sweetpotato are valuable to North Carolina's sweetpotato industry, because there are no other entities outside of academia that are researching issues related to sweetpotato production due to its relatively small market compared to other produce and cash crops. This is where globalization's effects are first seen in the SPCC.

3.2.3 Grower. A grower is considered as an individual who grows and sells crops. Growers for this study range in total sweetpotato acreage size from a couple dozen acres to thousands of acres. Every grower participant was male; though some were not the owners of the operations, they were directly related to the owner by blood or marriage. Every grower interviewed was part of a family operation.

3.2.4 Packer-shipper. While it is entirely possible that a packer is separate from a shipper, due to the operations encountered during this research, I will discuss the packer-shipper as one unit. Almost every operation that has a packing line also ships its sweetpotatoes. A packer-shipper may not be a grower, but there are growers who may have vertically integrated to include packing and shipping sweetpotatoes. The packer-shipper stores, packs, and ships sweetpotatoes. The packer-shipper may or may not sell directly to the buyer. If the packer-shipper does not grow its own sweetpotatoes, it acquires sweetpotatoes from other growers.

3.2.5 Broker. A broker arranges for the sale of sweetpotatoes between the seller and the buyer, taking a commission when the sale is finalized. Defining a broker in the sweetpotato commodity chain is not easy as several actors act as brokers with each defining what broker's job is in different ways. For example, there are produce companies who call themselves "brokers."

A broker that is solely a broker is fundamentally different than a produce company, because a broker in most cases is simply another term for "middle man" between the sellers and buyers, much like a realtor is a middle man between the seller of a house and the buyer of said house.

Produce companies pack and ship sweetpotatoes for growers, though a grower who goes through a produce company may pack sweetpotatoes for the produce company as needed. Typically, growers sell the sweetpotatoes to the produce company, who in turn sells the sweetpotatoes to buyers. Produce companies are valuable to many sweetpotato growers, because once the sweetpotato grower sells his/her sweetpotatoes to the produce company for a set price, he/she no longer has to worry about whether those sweetpotatoes are purchased by one of the buyers depicted in the commodity chains. This is another point where globalization has also taken effect, as farming operations develop subsidiaries that act as brokers in international markets.

3.2.6 Distributor. A distributor is a company to whom any of the above actors sells sweetpotatoes that in turn sells the sweetpotatoes to buyers (generally buyers that the above actors may not have access to for one reason or another). Usually at the retail level, sweetpotatoes are not shipped to the local store, but are shipped to distribution centers of the retail chain that send the sweetpotatoes to individual stores. Growers involved in international sales generally sell to distributors who have access to international buyers (though this is not always the case with the participants interviewed for this study). Due to the access to global markets that distributors may provide, this is another point where globalization has an effect on the sweetpotato commodity chain.

3.2.7 Buyers. In addition to the aforementioned actors who purchase sweetpotatoes (and in turn sell to the following buyers), buyers include retailers, restaurants/ food service,

processors, canneries, and wholesalers. Globalization has brought new buyers into NC's SPCC, as sweetpotato buyers now span across the globe. These are discussed in detail in the next section.

3.2.8 Consumers. The purchasers of the final product are consumers. Consumption takes place at several locations, including the home, religious institutions, restaurants, and locations where food is provided by foodservice. While consumer preferences may be influenced by food choices available to them, consumers are also able to shape and change the sweetpotato industry by demanding, through their wallets and through their comments, what they want from their food.

3.3 Buyers of Sweetpotatoes

For much of the sweetpotato industry's history, sweetpotato growers, packer-shippers, brokers, produce companies, and anyone else involved in selling sweetpotatoes, almost exclusively sold their sweetpotatoes to the fresh market, with off-grade sweetpotatoes primarily sent to canneries, fed to farm animals, or simply thrown out the backdoor. The first Census of Agriculture conducted by the USDA to include the number of acres of sweetpotatoes that were harvested for processing (and how many farms did this) was the most recent, in 2007.

This is not to say that in the past sweetpotatoes were only sold to fresh market, but, according to many participants, only recently have other actors entered the sweetpotato commodity chain to a measurable degree. Actors explored in this section are canneries, foodservice/restaurants, processors, and retailers. Most participants divided their business into fresh market and processing categories. Foodservice, restaurants, wholesalers, and retailers fall under the fresh market category and canneries, french fry makers, chip makers, and baby food companies, among other forms of processing, fall under the processing category.

3.3.1 Food service and Restaurants. The largest food service distributor in the United States, according to F01 (2011) is called Meadowbrook Meat Company, or MBM, and is located in Rocky Mount, North Carolina. MBM is the distributor of sweetpotatoes, at the time F01 was interviewed, for two well-known steakhouses. International Food House, Inc, or IFH, is another large food service distributor also based in North Carolina, who distributes sweetpotatoes to several large steak houses as well.

Restaurants are more demanding buyers than retailers. While retailers allow for more leeway on size and weight of sweet potatoes, food service and restaurant buyers need every sweetpotato ordered as close to the same size and weight in order to price the item on the menu. In addition, restaurants want customers to receive the exact same item regardless of whether the customer is purchasing in North Carolina or in the United Kingdom. This led to the use of an electronic sizer, first introduced to the sweetpotato industry by the Wayne E. Bailey Produce Company in 1990. The sizer can give restaurants sweetpotatoes that were identical. In addition, sweetpotatoes are packed differently for food service and restaurants; instead of only packing by weight, as is done for the fresh market, sweetpotatoes are also packed by count. This occurs so that restaurants can have a price point that incorporates the cost of the sweetpotato, a portion of the costs incurred to operate a restaurant, and still make a profit off of each sweetpotato.

Americans were, and many still are, used to seeing the sweetpotato on their tables at home during the holiday season. Once restaurants began serving sweetpotatoes, consumers could see the possible uses of sweetpotatoes besides as a dessert at Thanksgiving. The key to sweetpotatoes becoming a menu item at restaurants lay in getting the sweetpotato into just one restaurant. Once the sweetpotato was viable in the restaurant, others would follow. Participants recounted how sweetpotatoes got into one steakhouse—reportedly Outback Steakhouse—and

this led to it appearing on the menus of numerous other steakhouses (F04, 2011; PC03, 2011). When restaurants began preparing sweetpotatoes in a variety of ways, including as french fries, the consumer was able to see the different uses of sweetpotatoes and would try to replicate it at home. This drove growth in the sweetpotato market and opened the sweetpotato to possibilities in the value-added sector of processing.

3.3.2 Processors/Canneries. As mentioned earlier in chapter three, there are two drivers to the market growth of sweetpotatoes: international markets and processing. Processors include: chip companies, french fries, baby food companies, canneries, and any other value-added product, like sweetpotato pancake mix. Processing has allowed sweetpotato growers to achieve a goal that had eluded them: selling almost everything. F03 (2011) said, "Until the processing market boomed, that's the problem we had [selling everything]. You'd sell your retail, you'd sell your fresh market, and you'd have all this big pile of stuff you couldn't sell."

Processing gave sellers a new way to make money from sweetpotatoes that they were unable to in the past. Off-grade product is no longer tossed out the back door, fed to farm animals, or sent solely to canneries; now most, if not all, off-grade sweetpotatoes can be sold to one processor or another to be turned into one of dozens of different value-added products, including chips, french fries, an ingredient of stir-fry frozen vegetable packages, sweetpotato bread, sweetpotato pancake mix, and dozens more.

Traditionally, canneries received most of the off-grade sweetpotatoes sold to the processing sector. Canned sweetpotatoes were so prominent in the past, that there are at least three canneries in North Carolina alone. Today, however, canneries need to re-evaluate their role within the sweetpotato industry, because processing plants are dominating the processing sector of sweetpotatoes. As F05 (2011) phrased it: "My mom…years ago when we didn't grow

sweetpotatoes, she probably bought a can of sweetpotatoes…now, [the] younger age group, we'd pick up a bag of fries or chips…I guarantee my wife has never bought a can of sweetpotatoes. It's just different." Canneries have, like other businesses, diversified to include a range of sweetpotato products and to appeal to consumers outside of the holidays. One company, Bruce Foods, now has a diversified line of canned sweetpotatoes and innovative and different products such as sweetpotato pancake mix.

For F05 (2011), processing once accounted for about a quarter of the sweetpotatoes that were sold, but began to increase steadily as more value-added products were created and marketed. First processing increased to 30 percent, then 40 percent, and, as of 2010, fifty percent of what his farming operation sold went to processors (F05, 2011). One participant noted how a few years ago there were only five or so different sweetpotato products at supermarkets, but as of 2011 there are now more than thirty. This increase has occurred because new, value-added products are sold.

With the increasing demand of sweetpotatoes on the processing side, breeders have to consider the sugar profiles of sweetpotatoes, which are more complicated that what breeders initially thought (R02, 2011). This is important, because varieties of vegetables rise or fall based on which variety is chosen by actors in the economy, be it consumers or buyers of sweetpotatoes. For example, the Russet Burbank potato has become the dominant white potato in large part due to a well-known fast-food restaurant choosing it as the variety to use for french fries and baked potatoes served at the restaurants (R02, 2011; R03, 2011). This restaurant wanted the same variety and taste profile across the globe and this translated into using only one particular variety, forcing farmers to grow only that variety if they wanted to be a part of the customer base.

Currently, there are not enough sweetpotatoes grown in the United States to supply even one fast-food restaurant with enough sweetpotato fries to last a year, let alone meet demand in the fresh market and in foreign markets. According to the executive director of the NCSPC there are discussions with several different companies, including fast-food restaurants, about pushing sweetpotato fries on to the menus of large restaurant chains (Johnson-Langdon, 2011). However, as the executive director pointed out, not only is there not enough sweetpotatoes currently grown, but there is a shortage of storage facilities to store the amount of sweetpotatoes that the market would demand if sweetpotato fries were to be sold alongside white potato fries (Johnson-Langdon, 2011; F04, 2011; PC02, 2011).

When participants were asked what they thought of sweetpotato fries becoming a menu item at large fast-food restaurants they were cautious. One participant worried about what would happen if the sweetpotato industry was to plant and grow sufficient volume to supply french fries to fast-food restaurants, as well as other customers in fresh market and processing, but then they do not end up actually selling (F04, 2011). That would bust the market and possibly end the operations of several growers. PC02 (2011) hears growers that he buys from discuss getting into a fast-food restaurant chain to "really make sweetpotatoes take off," but he believes that once a consumer can buy sweetpotatoes "through the drive-thru window, you won't want to be growing sweetpotatoes anymore, because those companies will break you…They will get the price down if they can."

That's the rub: sweetpotato growers want to make more money and that means expanding where sweetpotatoes are sold. If that means growing sweetpotatoes to sell at a fast-food restaurant, growers may not make any money, because the price may be pushed down. Prices are pushed down when someone, somewhere will be willing to sell sweetpotatoes at a low

price in order to get into a fast-food restaurant. Anecdotal evidence provided by participants reinforces this, because the participants recounted times when sweetpotato sellers undercut competition in order to offload their sweetpotatoes quickly.

In 2010, Lamb Weston opened the first processing plant solely for processing sweetpotatoes into frozen products in Delhi, Louisiana. According to PC02 (2011), only five packing houses (out of more than twenty) in North Carolina were selected to sell sweetpotatoes to the processing plant. This is because "the more people that they buy from, the more paperwork, the more vendors that they've got to deal with. They buy from a few vendors and they make us deal with it." As discussed in Chapter Two, having only a limited number of firms available for farmers to sell their goods may cause money to leave the community, which is the case for North Carolina growers since their goods are shipped to Louisiana. F05 (2011) believes that a processing plant like the one in Louisiana is coming to North Carolina and sees this as "a good thing. Save all that freight from going to Louisiana. And there's such a market here on the East Coast with so many people from Florida to New York." The location of processing plants for sweetpotatoes can impact who leads the sweetpotato industry. This is because, though plants are built where there is a lot of sweetpotato production, a plant can be built where there's little production and sweetpotato farms develop around the plant due to transportation costs.

However, having a processing plant in North Carolina may not necessarily be a good thing. F01 (2011) notes that "if North Carolina is not able to supply the plant and keep it supplied with all the sweetpotatoes it needs, it means they're going to be bringing in sweetpotatoes from other areas and they could bring in the sweetpotato weevil." The sweetpotato weevil is a pest that decimates crops and North Carolina has strict quarantine laws concerning the sweetpotato weevil, because of the destruction it can cause. F04 (2011) admits

that this may be a threat, but contends that as long as the law is followed, the sweetpotato weevil would not be able to get into the state and the benefits of having a processing plant within the state are enormous.

Currently, most of the sweetpotatoes exported to foreign countries are for the fresh market. PC03 (2011) said a very small percentage of the sweetpotatoes he sends to foreign markets goes to processing facilities. He said, "We're sending potatoes to Italy and making pasta out of them. Making it in Italy and shipping it back to the United States to sell to Trader Joe's. That's what's going to happen globally with sweetpotatoes going east." What he meant by that is though processing sweetpotatoes currently does not play a large role in export shipments, the market is heading in that direction. Not only are value-added products becoming popular in the United States, but as consumers in foreign markets learn more about the sweetpotato and various products made from sweetpotatoes, value-added products will become popular in other countries as well.

3.3.3 Retailers/Wholesalers. Most sweetpotatoes are sold to fresh market venues, such as restaurants and foodservice discussed earlier, but also to retailers and wholesalers. Almost all sweetpotatoes sold to foreign markets are sold for fresh market avenues. Each participant that exports sweetpotatoes reported 95% of the sweetpotatoes sold to international buyers were raw (unprocessed) sweetpotatoes; however, just because sweetpotatoes are intended for the fresh market, does not mean they are not eventually sold to processors.

Retailers are especially important in increasing consumption of sweetpotatoes by consumers. Often, participants noted, consumers will purchase a dish that includes sweetpotatoes at a restaurant and go home and attempt to reproduce the dish. This is seen with sweetpotato fries, which first made an appearance in steakhouses and then processors quickly

produced products like frozen sweetpotatoes in bags, for consumers to purchase at retail stores and cook at home. The retailer typically has conventional and organic sweetpotatoes in the produce aisles and also sells sweetpotatoes in various processed forms throughout the store, including frozen food items, baby food, and products that use sweetpotatoes as an ingredient. Retailers also exercise a significant amount of control within the sweetpotato commodity chain through food standards, which are discussed later in this chapter.

3. 4 Other Actors.

3.4.1 Labor. Labor occurs at all levels of the commodity chain. Of particular interest to this study, labor is examined at the grower, packer-shipper, and logistical levels. At the labor segment, other actors are brought into the chain, including the North Carolina Growers' Association, domestic workers, and labor crews. Workers are involved in the planting, harvesting, and post-harvesting steps of a sweetpotato operation, as well as the logistics involved in sweetpotato farming. It is important to recognize the labor that is involved in the harvesting, packing and shipping of sweetpotatoes. Though the owners are the ones who are taking the financial risks of running the farming operation—an operation where too much or too little rain may mean financial ruin, or worse, an infestation of the sweetpotato weevil—the owners recognize the importance of labor, and often migrant labor, to the operation.

Sweetpotato production is very labor intensive, because much of the planting and harvesting of sweetpotatoes is performed by hand. The aspect of labor that is significant for this study is the national origins of the workers. There is diversity in the labor force, but a significant number of employees are from Mexico. In fact, at least two growers' employees, from planting to harvesting, are almost entirely H-2A[5] workers who come from various regions of Mexico

[5] H-2A workers are foreigners who are allowed to enter the United States for temporary or seasonal agricultural work

(F04, 2011; F06, 2011). Every other participant stated that a majority of the workers employed are of Hispanic ethnicity.

For F04 (2011) and F06 (2011), many of the H-2A workers have worked for their operations for several years and some employees have even advocated for relatives to join the crews. The workers were not just employees to F04 (2011) and F06 (2011), because they have known most of them for years, so they have become part of the farming operation's family. F04 and F06 only employ workers through the North Carolina Growers Association (NCGA)[6], which means only males work for F04 and F06 out of the H-2A workforce.

Employees are predominantly males, because the North Carolina Growers Association only brings male workers to North Carolina farms. This is so growers will have fewer Department of Labor regulations to comply with and not have to worry about complications that may occur in a male-female relationship, according to several participants with knowledge of how the workforce is determined. For example, a Department of Labor regulation regarding access to restrooms requires one restroom available for every 20 laborers in the field. If there are 19 male workers and 1 female worker, the grower would be required to provide two restrooms. Farming operations use the H-2A program through the North Carolina Growers Association in order to stay above-board; they do not want a raid on their labor facilities and the headache that could cause their business.

3.4.2 Transportation logistics. Transportation logistics is an essential aspect of in the sweetpotato commodity chain and its ability to expand into foreign markets. When asked the best way to sell sweetpotatoes, F05 (2011) responded, "The truck sitting out there. When I tell them I'll be there in the morning, I'll be there. That's our strongest point…you don't want to be

[6] NCGA is an organization whose members are solely from the agricultural sector and it assists agricultural employers with administrative tasks and paperwork required to get H-2A workers

late and if you're late you'll pay for it." Packer-shippers need to be able to get sweetpotatoes to the buyer as quickly as possible. This is especially important with foreign markets: the truck needs to be at the boat on time, which needs to leave as soon as possible after loading sweetpotatoes on to the ship, and the ship needs to travel across the Atlantic Ocean as fast as possible. Once sweetpotatoes arrive at the importer's location, the sweetpotato still has more travel ahead of it to reach the retail location, restaurant, distributor, or any other location that the sweetpotato needs to go to in order to reach the consumer. Transportation is an important aspect of the sweetpotato commodity chain, because so much depends on timely transportation.

3.4.3 Support agencies and governance institutions. There are numerous other entities within the commodity chain. These are: the North Carolina Sweetpotato Commission, North Carolina State University, Southern United States Trade Association, and the US Sweetpotato Council. Several of the organizations are directly linked to the state and national levels of government, including the aforementioned ones. There are other actors, including the United States Department of Agriculture, the United States Department of Labor, North Carolina Department of Agriculture and Consumer Services, the Farm Bill, agricultural laws, international trade agreements, and food safety standards (G.A.P., which falls under the Food and Drug Administration, and GLOBALG.A.P.), that also play a role in the SPCC. Their roles in the SPCC are analogous to the role of the rules of a sporting game: the actors are sports players who must follow the rules that these organizations set up for them in order to continue to play without consequence.

3.5 The Role of Food Safety Standards

Food standards mandated by retailers and certifying agencies play a large role in whether or not a packer-shipper can export sweetpotatoes to the United Kingdom and the European

continent. While Freidberg (2004: 5) sought to demonstrate how "the power to demand goodness in food…has introduced new forms of domination and vulnerability into postcolonial food commodity networks" this same power is used in commodity networks between retailers in European countries, specifically the United Kingdom and Western Europe, and growers and packer-shippers in the United States.

Freidberg gives some credit to the WTO for the creation of this "power to demand goodness," because "the defense of consumer health and safety became one of the few permissible 'non-tariff trade barriers,' and one that wealthy WTO member states have invoked repeatedly" (2004: 5). This invocation of food standards not only occurs to developing countries, but also to sweetpotato growers in North Carolina. For example, a popular postharvest fungicide, Botran, is not allowed on sweetpotatoes imported into the European Union. This resulted in growers using a far more expensive fungicide, Scholar, to preserve sweetpotatoes exported to European Union countries.

Food standards are used as a form of power, but they do not discriminate based on country. Though, as may be expected, actors in some countries may have an easier time complying with standards than in other countries, just like individual actors within a country may more easily comply with standards than other actors within that same country. Packer-shippers must, in order to participate in the export market, retain a certification in specific audit schemes determined by the buyers. The most well-known scheme is the GLOBALG.A.P.; however, certain schemes classified as GFSI (meeting certain benchmarks of the Global Food Safety Initiative) are increasing in popularity amonst buyers. Examples of GFSI certification include: GLOBALG.A.P., BRC, SQF, Primus GFS, and several others. These are considered the most

stringent food safety standards, requiring more time, investment, and resources on behalf of growers, packers, and manufacturers.

GLOBALG.A.P., formerly EUREP, certification was developed as a global standard representing consumers' needs in a globalizing food sector (GLOBALG.A.P.). This certification applies to activities pre-farm-gate and does not cover activities after products have left the farm (GLOBALG.A.P.). Requirements vary depending on the farming operations crops or livestock. These requirements include, but are not limited to: using, or not using, certain chemical inputs; safe and clean working conditions for workers; preventing contamination of produce by following certain handling procedures; ensuring equipment is clean and well-maintained; maintaining water quality levels as specified by regulations; and maintaining records of activities related to the crop from planting to post-harvest procedures.

With North Carolina's sweetpotato industry, it is not known exactly how many growers and packer-shippers have obtained food safety certification. However, based on the buyers that many of the larger sweetpotato growers and packer-shippers reported during their interviews, several of the participants have received certification in one of the GFSI-schemes, because their buyers require high food safety standards. Several operations do release press statements on whether or not they are GFSI certified, but remain vague on the exact certification they have received. This is both due to requirements of the various auditing schemes and to prevent competition from knowing exactly what occurs within an operation.

Retailers have also developed their own sets of food standards that suppliers are required to meet in order to obtain certification to sell produce to those retailers. For example, if suppliers want to also court the retailer Tesco, based in the UK and the second largest profit-making retailer in the world they must also gain Tesco Nature's Choice certification. Tesco's purpose in

establishing its own certification scheme, which was first conceived in 1991, is to have a standard for produce throughout the world that promotes not only "good agricultural practice but the best agricultural practice" (Tesco, 2006). According to Tesco's website, a technical advisory committee was created to ensure that standards are up to date and decisions are made by an independent body (Tesco, 2006). Requirements to meet certifications include: rational use of crop inputs; pollution prevention; wildlife and landscape conservation; recycling, re-use, and energy conservation, and protection of workers' health (Tesco, 2006). Like GLOBALG.A.P. certification, there is a significant amount of paperwork involved in obtaining certification. Tesco is an important buyer of North Carolina sweetpotatoes as most, if not all, of the major sweetpotato exporters from North Carolina sell to them. In addition, buyers will often send their own quality assurance or food safety personnel to an operation and conduct their own audits.

One part of maintaining the certification of food standards like GLOBALG.A.P. and Tesco Nurture's Choice includes having a traceability system. A traceability system involves knowing one-step back and one-step forward from an operation's position in the supply chain and assigning case level identification to the product (such as a unique number). For example, a produce company that uses traceability systems must know who grew the sweetpotatoes they purchased (one-step back) and who the operation sold the sweetpotatoes to (one-step forward). This number follows the sweetpotato from the field to the consumer's kitchen. If there was a recall of the product, this number can identify which field the contaminated product was grown in and helps buyers know which product to pull from their shelves before the situation worsens.

Increasingly, the ability to trace sweetpotatoes from the field to the shelf is an important marketing tool, as well as a requirement by buyers and auditing schemes. However, this limits who can enter into the produce market. Trace back capabilities are seen as an important food

safety tool for North Carolina sweetpotato growers and will probably increase in usage as more retailers request—or require—that produce be traced back to the field it was grown in.

Even though many of the actors in North Carolina's sweetpotato commodity chain do not export a significant amount of sweetpotatoes to international markets, they are not immune to the increasing food safety and quality assurance requirements. In fact, several participants not involved in the global market (selling less than an estimated five percent of their product to international buyers) still retain auditing schemes that are primarily geared towards selling internationally. This is due to requests from buyers. The addition of food safety auditing schemes to the SPCC has assisted in expanding the SPCC (by including actors that may not have otherwise entered the SPCC) and demonstrated the role globalization plays in the SPCC of North Carolina.

3.6 Summary of Findings

As is seen in the commodity chains depicted at the beginning of this chapter, the role of any individual sweetpotato actor and its connection to others may vary from actor to actor. Many of the larger growers have vertically integrated the packer, shipper, and broker elements of the SPCC; using their own packing lines, shipping their own sweetpotatoes; and employing salespeople as needed. Some growing operations have "middle management" (supervisors, extensive office support) while other growing operations have direct contact between the owners and employees in the field and the pack house. Moving along the commodity chain, we can see the complexity that is involved in selling and distributing sweetpotatoes that consumers purchase from a variety of locations. The sweetpotato does not follow a straight line from farm to table and the paths it takes show globalization at work within North Carolina's sweetpotato industry.

Constructing these commodity chains are essential to understanding which segments of the sweetpotato commodity chain are impacted by globalization. Several segments of the sweetpotato commodity chain are influenced by globalization, including: research and development (creating and developing technology that allow sweetpotatoes to be stored year-round and varieties that will have the shelf-life and quality of life needed to sustain long journeys over the ocean to overseas markets); labor (much of the labor used in North Carolina's sweetpotato industry are immigrants); and marketing and distribution (marketing, promoting, and selling sweetpotatoes in other countries). Examining the sweetpotato buyers revealed their control and power (every participant claimed the buyers hold 100% of the power) in the commodity chain through the use of food standards and other requirements to meet their standards.

CHAPTER FOUR: THE GLOBALIZATION OF NORTH CAROLINA'S SWEETPOTATO INDUSTRY

Globalization does not just happen "to" a location; a location also participates in globalization. Using the definition of globalization first posited at the beginning of this thesis,[7] examination of globalization's effects on North Carolina's sweetpotato commodity chain can occur. In doing so, we can construct North Carolina's sweetpotato commodity chain (SPCC) and identify where globalization has occurred within the SPCC and/or where globalization has impacted certain points of the SPCC. However, to develop North Carolina's SPCC, certain aspects of the sweetpotato industry and its role in the larger global sweetpotato economy must be examined.

This chapter is divided into several sections. Before delving into the data, it is important to define what is considered an international market for the purposes of this study. Then the history of sweetpotato exports is identified in order to determine when globalization first influenced North Carolina's sweetpotato industry. This is followed by identifying and examining global markets that the United States as a whole has access to and how North Carolina in particular has gained access to these markets. This chapter ends with an examination of North Carolina's competition in the sweetpotato market, how this has impacted North Carolina's access to global markets, and the overall findings of this chapter.

4.1 What is Considered an International Market?

An international market, to most people, is another nation's economic market, regardless of whether the market is Canada or in France. However, many of the participants of this study consider sales to Canada as domestic sales. In fact, one participant (PC03, 2011) went so far as

[7] Globalization is defined as access to markets and is an ongoing process that will never be completed, is complicated, and lengthens and expands the spatiality of the commodity chain into the global market.

to say that many sweetpotato growers, when reporting sweetpotato sales for a certain time period, often list sales to Canada under the domestic column. This certainly skews any data that have been gathered on sweetpotato exports. When Friedland (2004: 5) defined globalization for his paper, it included the commodity chain expanding outside of local, national, and regional boundaries. Canada, the United States of America, and Mexico are geographically located in the same region.

However, international for this thesis means another country; if the country that the sweetpotatoes were exported to is not the United States, the sale is considered international. While there are many who consider Canada as regional and not relevant to determining the effects of globalization, I argue that Canada should not be excluded from showing how globalization has affected North Carolina's sweetpotato industry. Despite Canada being the United States' neighbor to the north, the number of sweetpotatoes exported to Canada from North Carolina has changed significantly over the past fifteen years due to globalization. In addition, Canada is an entirely different culture than the USA (and certainly the southern USA where most of the US's sweetpotatoes are grown). The difference in food (or culinary) culture has almost certainly played a role in the expansion of sweetpotato exports as Canadians have become more familiar with the sweetpotato.

4.2 Historical and Present-day International Sales of USA and NC Sweetpotatoes

Historically, as discussed in Chapter Two, the United States did not export sweetpotatoes, at least not significant amounts that were reported to the USDA, until 1989. Sweetpotato exports from North Carolina have increased since 1989, but only since 2000 have increases occurred continuously from year-to-year. Sweetpotato exports have risen 726% from 1996 to 2010.

From 1996 to 2001, excluding the "Unknown State" category, Louisiana and California were the leading exporters of sweetpotatoes. Beginning in 2002, Louisiana remained the top sweetpotato exporter until 2005, when North Carolina became the leading exporter. In 2010, North Carolina accounted for 55% of the United States exports. The second leading sweetpotato exporter, California, accounted for 10% of the sweetpotato exports. They were followed by Virginia (7%), "Unknown State" (7%), New Jersey (4%), Louisiana (3%), and Arkansas (2%). The remaining 12% of sweetpotato exports are accounted for by the remaining thirty states of the Union.

In 1996, the earliest year data are available, the value of North Carolina's exported sweetpotatoes to "all countries" was USD 512,737.00. These data only considered the United Kingdom and Canada under the "all countries" column. Exports to the United Kingdom were valued at USD 31,972.00 and exports to Canada were valued at USD 480,765.00. These data are shown in Figure 10. North Carolina was a small player in sweetpotato exports at that time. Prior to 2000, total sweetpotato export sales from North Carolina were less than USD 1 million. In 2005, sweetpotato exported from North Carolina totaled more than USD 10 million. By 2009, sweetpotato exports amounted to more than USD 20 million; in 2010, this figure almost doubled to more than USD 36 million in sweetpotato exports from North Carolina.

Figure 11 depicts the trajectory of the percentage of total USA sweetpotato exports that North Carolina accounts for. As this figure demonstrates, this percentage saw significant jumps between 2004 and 2005, when North Carolina became the leading sweetpotato exporter in the US, and between 2009 and 2010. The most significant episode to occur within those years is the involvement of the North Carolina Sweetpotato Commission (NCSPC) in 2005, when it began promoting and marketing North Carolina sweetpotatoes in the United Kingdom and Western

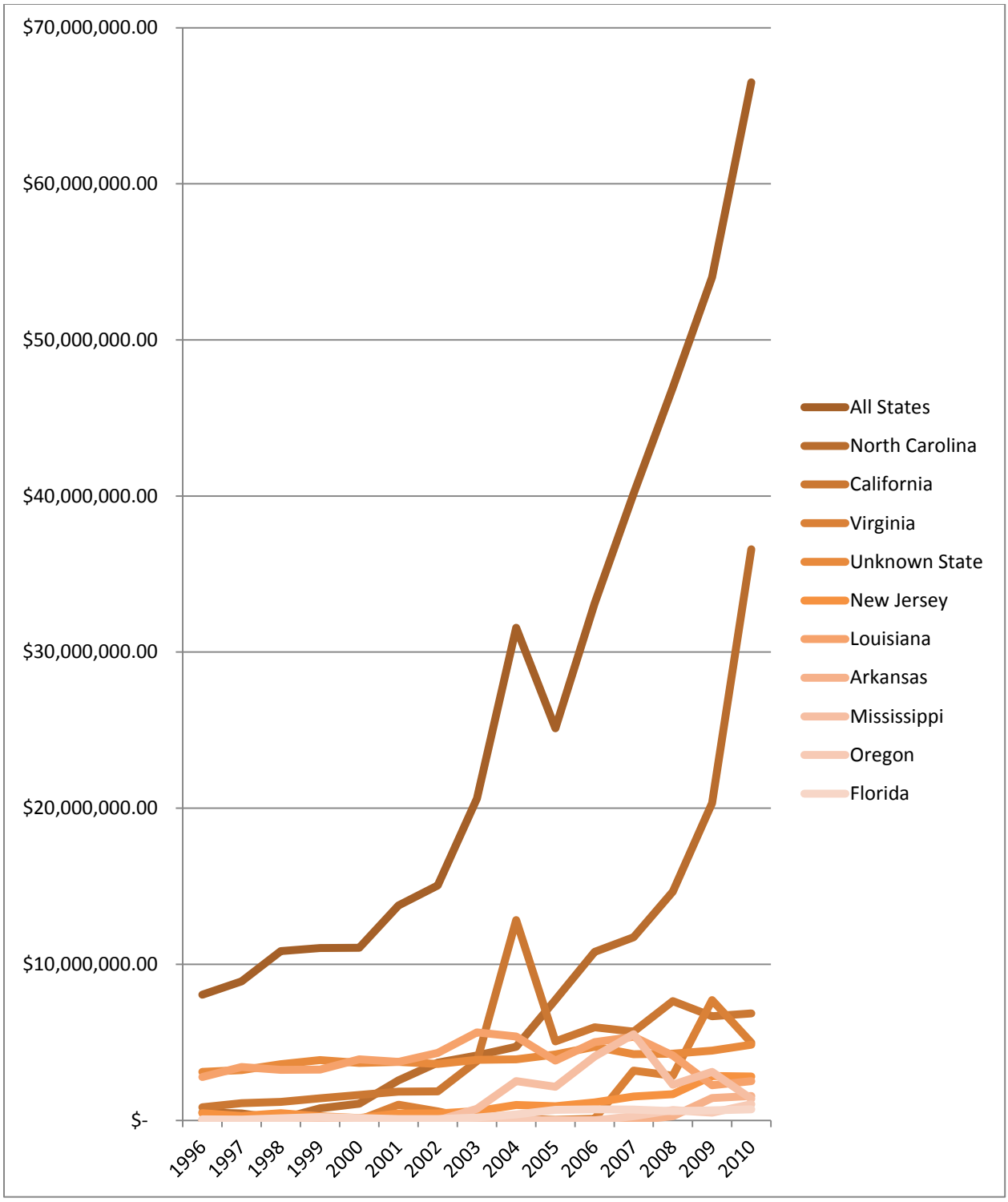

Figure 10. USA Sweetpotato Exports, 1996-2010. In USD. Data Source: http://wisertrade.org and US Census Bureau Foreign Trade Division.

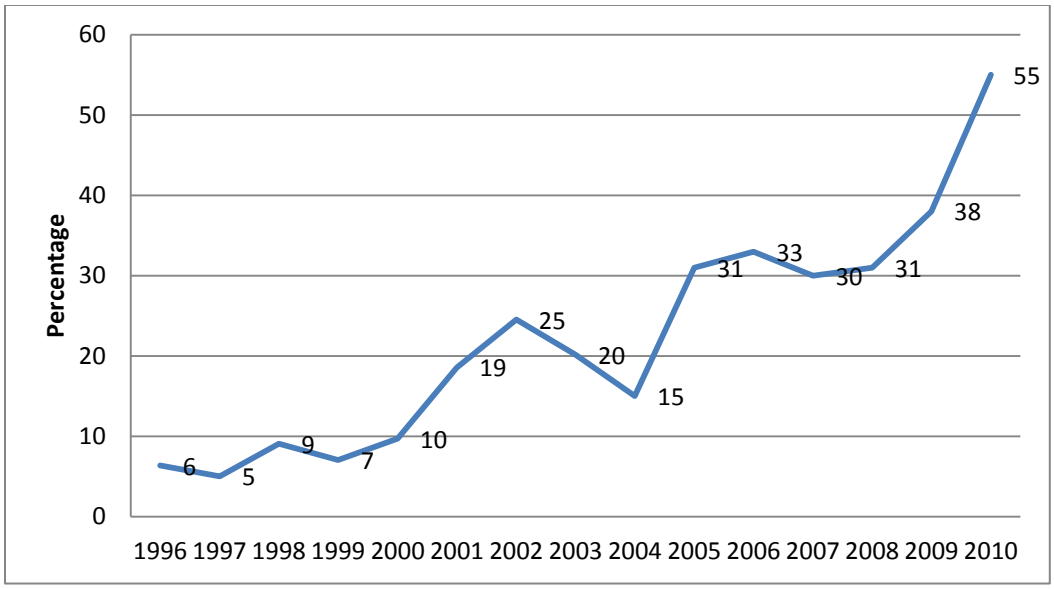

Figure 11. North Carolina sweetpotato exports as a percentage of total US sweetpotato exports, 1996-2010. Data source: http://www.wisertrade.org, data from U.S. Census Bureau Foreign Trade Division.

Europe (NCSPC, 2011: 8). Due to the significance of the NCSPC's shift in focus from solely domestic sales and marketing to include the global sweetpotato market, the NCSPC is discussed in depth in the next chapter.

The United Kingdom imported sweetpotatoes with a total value of US $31,972 in 1996 and by 2010 sweetpotatoes with a total value of US $15,588,390 were exported. Shipments to Canada have increased from US $480,765 in 1996 to US $16,970,880 in 2010. Figure 12 displays the annual dollar amount for sweetpotatoes exported to various countries from North Carolina from 1996 to 2010. The percent change from 1996 to 2010 of sweetpotato exports from North Carolina is over 7,000%. These changes in how much is shipped to Canada and other countries from North Carolina indicate that the global market has increasingly become important to the sweetpotato industry.

One of globalization's effects on NC's sweetpotato industry can be seen when focusing on where sweetpotato operations invests their money. One sweetpotato farming operation has shifted its focus from domestic sales to international sales of sweetpotatoes. This operation has invested significant capital in exports, even incorporating a subsidiary and locating it within the United Kingdom. Seventy percent of the sweetpotatoes grown by the farming operation are sold to that subsidiary, which in turn sells to buyers in Europe. This has happened, because the farming operation recognizes the impact globalization has on the sweetpotato market in general. It envisions North Carolina's sweetpotatoes as the predominant source of sweetpotatoes in the export market as access to markets—globalization—continues to open up for North Carolina's sweetpotato industry.

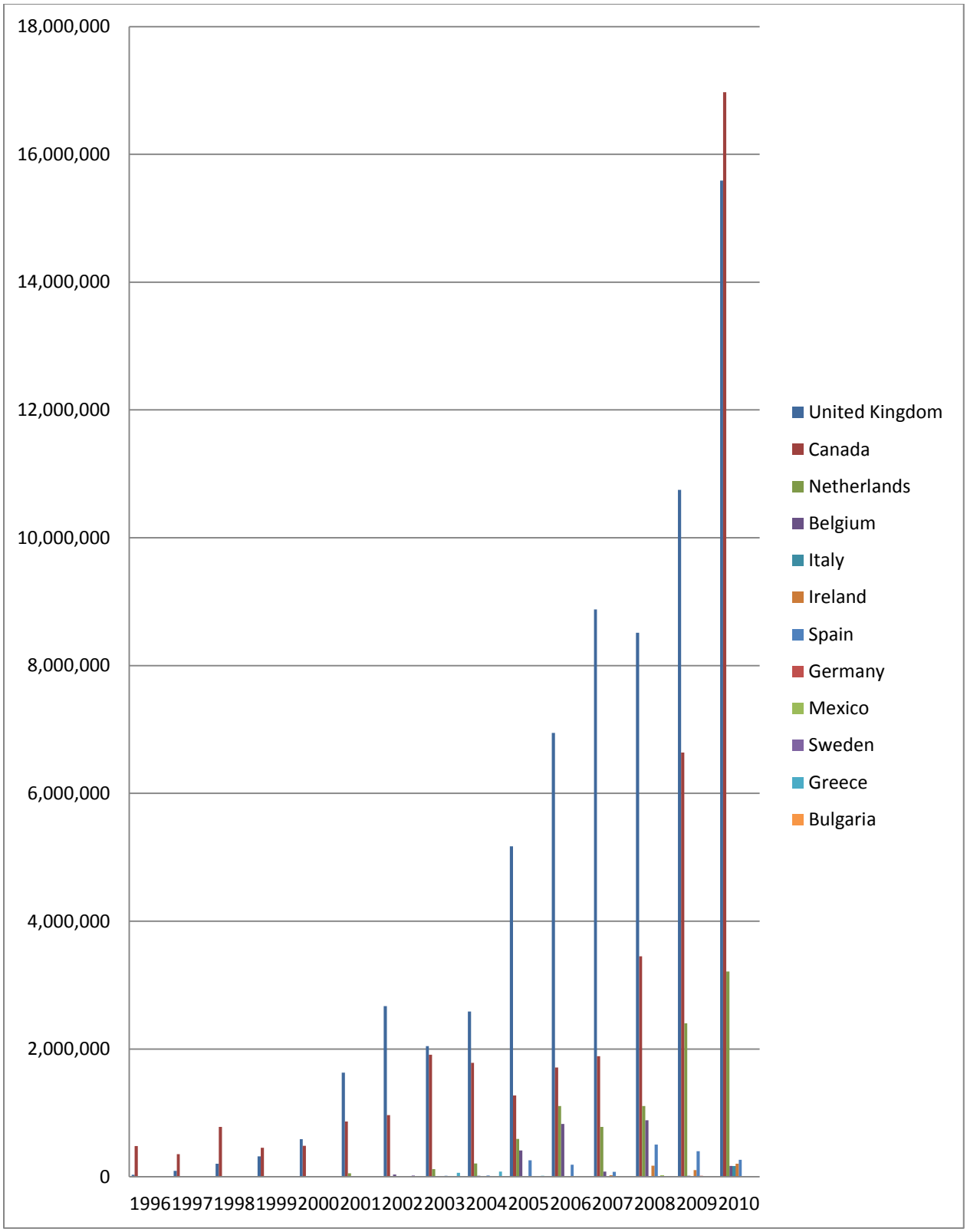

Figure 12. Annual dollar amount of sweetpotatoes sold to different countries from North Carolina, 1996-2010. Source: http://www.wisertrade.org, data from U.S. Census Bureau Foreign Trade Division.

4.3 Changes in the Sweetpotato Industry

A number of changes have occurred in the sweetpotato industry that have facilitated North Carolina's rise in international sales. The first decade of the 21st century was not the first time North Carolina sweetpotatoes have travelled to Europe. One operation that no longer sells overseas, once sold sweetpotatoes to a single restaurant in the United Kingdom, during a period of time when the only shipments of sweetpotatoes were to military bases in Western Europe (F06, 2011). F06 (2011) sold the sweetpotatoes for five times the price sweetpotatoes sold for in North Carolina, because he was air freighting the sweetpotatoes to the restaurant. This continued until overseas shipping began to become more commonplace and the restaurant was able to buy sweetpotatoes from other sellers. Historically, most, if not all, sales of sweetpotatoes to "overseas buyers" were actually sales to the United States government, which does not constitute globalization.

PC03 (2011) spoke of how he first began shipping sweetpotatoes overseas around the mid-1980s, using what he described as a "secret" method (which I will not disclose here) to preserve the look and shelf life of sweetpotatoes that were shipped. F01 (2011) began shipping sweetpotatoes overseas in the 1970s, but after a few years, shipments to international markets stopped and did not occur again until 2001. Shipments ended due to the inability to provide the proper size sweetpotatoes to European markets (F01, 2011). The sweetpotatoes that American consumers preferred did not suit the consumers taste—they were too large for European consumers. However, this was a lesson for North Carolina's sweetpotato industry, because it taught the potential sweetpotato exporters that size and weight preference by the consumer must be met in order to have success in international markets.

F03 (2011) said changes in the sweetpotato industry have "transformed our business [into] a global business, it has transformed us to a genuine, twelve-moth, everyday operating facility." These changes included storage and curing procedures, how sweetpotatoes are graded, new sweetpotato varieties, and change in (and recognition of) the culinary culture. Many changes discussed here were facilitated by various entities involved in the sweetpotato industry, which are discussed in the next chapter. For now, I will focus on the changes that have impacted the sweetpotato industry.

4.3.1 Technological changes that have impacted the sweetpotato industry. Technological changes in the sweetpotato industry have transformed how sweetpotatoes are sold and who buys them. Those technological changes have affected how sweetpotatoes are stored, cured, and graded. By the 1990s, storage facilities (where sweetpotatoes are stored) were refashioned to have the proper temperature control needed in order to cure sweetpotatoes or new buildings were also built, specifically designed with features that allowed for curing (some with the assistance of integrated computer programs developed by researchers at North Carolina State University).

Sweetpotatoes are now cured for at least two reasons: quality and shelf-life. Curing is a process that takes five to seven days. After harvesting the sweetpotatoes, they are put into large field bins, the bins are placed in a room that is 85 degrees Fahrenheit with 85 to 100 percent humidity. This causes the starches in the sweetpotato to turn into sugars, thus making the potato 'sweet.' It also heals any nicks that may have occurred during harvest. Curing allows sweetpotatoes to be stored for long periods of time (for about a year) and allows sweetpotatoes to be shipped long distances—such as across the Atlantic Ocean (F01, 2011; R01, 2011).

This change in when sweetpotatoes are sold—once sweetpotatoes were sold green (practically fresh out of the ground), but now they are sold after curing—is an important change

that has led to the growth of sweetpotatoes both domestically and internationally. Prior to curing and proper storage facilities that allowed sweetpotatoes to be sold year-round, sweetpotatoes were exclusively sold during the period of time from Thanksgiving to Easter. By Easter, growers wanted all of their sweetpotatoes sold. After Easter, the heat and humidity increased, causing the sweetpotatoes to spoil and no longer be fit for human consumption. This may have influenced the culinary cultural perception of sweetpotatoes, because their harvest time coincided with Thanksgiving and the period of time around Easter was the end of the season that was cool enough to keep sweetpotatoes from spoiling. Because this time was also the holiday season, sweetpotatoes became known as a holiday vegetable.

However, once curing and controlled-atmosphere storage was introduced to the sweetpotato farming community, how sweetpotatoes were sold began to change. Sweetpotatoes were able to remain at the proper temperature and relative humidity throughout the year in storage. This expanded the sweetpotato season from five months to twelve months. With sweetpotatoes available year-round, restaurants and processors had access to a consistent supply. Buyers were able to expand sweetpotato products from only fresh and canned sweetpotatoes to dozens of different sweetpotato products, including frozen. While the immediate effect was in the domestic sweetpotato market, these changes facilitated access to global markets for North Carolina's sweetpotato industry.

PC03 (2011) claimed he was the first "one that started shipping potatoes cured, not green, but cured year-round." PC03 claimed he turned buyers on to cured sweetpotatoes by using an analogy: "As fine wine gets better with age, so do sweetpotatoes and yams," in which he equated aging wine with curing sweetpotatoes (PC03, 2011). This was written on marketing materials that were seen by and distributed to buyers as reminders that a cured sweetpotato tasted

and stored better than green sweetpotatoes. Today, there is a continuing effort by various organizations and individual exporters, to promote cured sweetpotatoes in international markets, because competitors from other countries still ship green sweetpotatoes.

These changes that I have described may be best illustrated by anecdotal evidence provided by a grower-packer-shipper. F01, whose family has grown and sold sweetpotatoes since the 1960s, described the changes by recounting the history of his company. When F01's father first began growing sweetpotatoes, he sold them to packer-shippers. At the time, the only involvement of F01's father was growing the sweetpotatoes. This changed first when F01's father started to store his own sweetpotatoes and then when he began packing his own sweetpotatoes, followed shortly by shipping and selling his sweetpotatoes. Here F01 (2011) states, "That's your vertical integration as far as the sweetpotato industry is concerned." The operation is vertically integrated because F01's father did not want to pay brokers and lose profits.

Due to innovation on the part of sweetpotato growers and North Carolina State University, a workable refrigeration system was developed in order to store sweetpotatoes past Easter and sell into the summer months. The refrigerated system was installed in a handful of buildings as part of F01's sweetpotato operation not far from the sweetpotato fields and office building, which helped F01's operation in marketing and selling sweetpotatoes up to thirteen months, but usually until the next crop came into storage.

This in turn helped increase demand: "food service and [restaurants] became interested in carrying sweetpotatoes, because they knew they could get a consistent, year-round, quality supply" (F01, 2011). Before refrigeration, almost all of the sweetpotato customers were fresh market and canneries. Refrigeration provided F01, and the rest of the sweetpotato industry, with

new customers, such as food service and restaurants, because those customers now had a steady supply of sweetpotatoes available.

Another change that benefited North Carolina's sweetpotato industry involved another crop North Carolina is known for: tobacco. Tobacco has placed NC growers and packer-shippers in a unique position over other states and countries. Most of the growers interviewed for this study still grow tobacco, but two (a grower and a produce company which also grows crops) do not grow tobacco. According to F01, the tobacco buyout,[8] gave many growers in North Carolina the "financial base that they can leverage and really expand and build these buildings [for storing sweetpotatoes]…sweetpotato production is very capital intensive" (F01, 2011) and the buyout gave many farmers eager to enter or expand sweetpotato production the money to do so.

North Carolina growers were "used to storage here, because of tobacco…they're used to storing tobacco and curing it. Same processes are involved in sweetpotatos…[which] worked in their favor" (R01, 2011). While storage and curing have helped create a sweeter sweetpotato and expanded the marketing time window to a full year, the costs to build this infrastructure often means only the larger operations can afford to have storage facilities.

Several participants discussed the cost of a cured, year-round sweetpotato: "Every year the amount of money it costs just to grow the infrastructure to meet the market is staggering. Building buildings to house sweetpotatoes and bins and things like that" (F03, 2011); having sweetpotatoes year-round "costs more…we put up a building last year just to store sweetpotatoes year-round…but when you [install] a controlled atmosphere storage, it costs a lot of money….increased costs, increased risks" (PC02, 2011); "It's not as easy getting into

[8] The tobacco buyout resulted in the termination of the tobacco quota system under The Fair and Equitable Tobacco Reform Act of 2004 (P.L. 108-357) and was formalized by the USDA in 2005.

sweetpotatoes as it is for other commodities… it takes a lot of money, for bin boxes and storage" (PC03, 2011). The costs of curing and storing sweetpotatoes are high, but the return for the growers, distributors, produce companies, packer/shippers, and anyone else involved in selling sweetpotatoes, may outweigh the risks and it opens new markets for North Carolina sweetpotatoes.

In order not to disclose the identities of participants and their incomes, I cannot disclose the "numbers" behind these estimates, but sweetpotato exporters receive revenues that range from a hundreds of thousands of dollars to multi-millions of dollars (remember, this is straight revenues, not profit). The more sweetpotatoes an exporter sells or the more the exporter charges for his/her sweetpotatoes, the higher his/her revenues. Several of the participants that are at the high end of that range credit international sales for increasing revenues. Sweetpotatoes are sold at a higher price to international buyers due to the increased risks involved with shipping sweetpotatoes overseas, as well as costs incurred due to stricter plant protection product (PPPs, such as pesticides, herbicides, etc) regulations.

Figure 13 depicts storage bins used for storing sweetpotatoes. Storage bins, storage facilities, and the technology required to make the storage building suitable for sweetpotatoes require significant monetary investments. However, these investments in infrastructure are necessary in order for growers and packer-shippers to enter the sweetpotato business (except for those growers who choose to only grow sweetpotatoes and then sell their harvest to brokers, produce companies, or packer-shippers).

The ability to grade sweetpotatoes to specific sizes requested by customers is an important technological advancement and aspect of marketing to domestic and foreign buyers. Grading sweetpotatoes, like any other produce, means sorting the sweetpotatoes into different

Figure 13. Sweetpotato storage bins. Source: Wayne E. Bailey Produce Company. http://www.sweetpotatoes.com/OurProducts/CuringandStorage.aspx

sizes: US Extra No.1, No. 1, US Commercial, and US No. 2. When PC04 (2011) first began working at the produce company he now owns, the employees graded the sweetpotatoes by hand in the field (which is still done today as an initial grading process). The sweetpotatoes were brought into the pack house and placed on a conveyor belt. A worker sat on the floor at the end of the belt catching the sweetpotatoes and placed them into cartons. The box of sweetpotatoes was then topped off with "cappers, beautiful potatoes to help the image of the box" (PC04, 2011).

Today, the larger packing houses use electronic sizers to sort their products into the size the buyer wants: by diameter, by length, and by weight (F05, 2011). PC04 (2011) estimates that there are 15 electronic graders in the United States, 11 of which are owned by North Carolinian packer-shippers. The electronic sizer is so essential to a grower or packer's operation that I was not allowed to photograph any of the many electronic sizers I was able to view in order to protect proprietary modifications.

One employee, E02, escorted me on a tour of the operation's facilities and noted that the operation recently needed to upgrade the sizer, so the president of the farming operation consulted with buyers in their overseas market (specifically the United Kingdom) to ensure that the grader met the specifications of their most important buyers in that market. Figure 14 depicts a portion of an electronic sizer used to sort sweetpotatoes to customers' specifications (this is not necessarily from a participant in this study). The secrecy surrounding the electronic sizers is due to the modifications made to each sizer in an effort to become better than the competition at sorting sweetpotatoes into the exact specifications of a buyer.

Grading may seem like a simple aspect of the sweetpotato commodity chain and not important to globalization's effects on NC's sweetpotato industry, but in fact it plays an

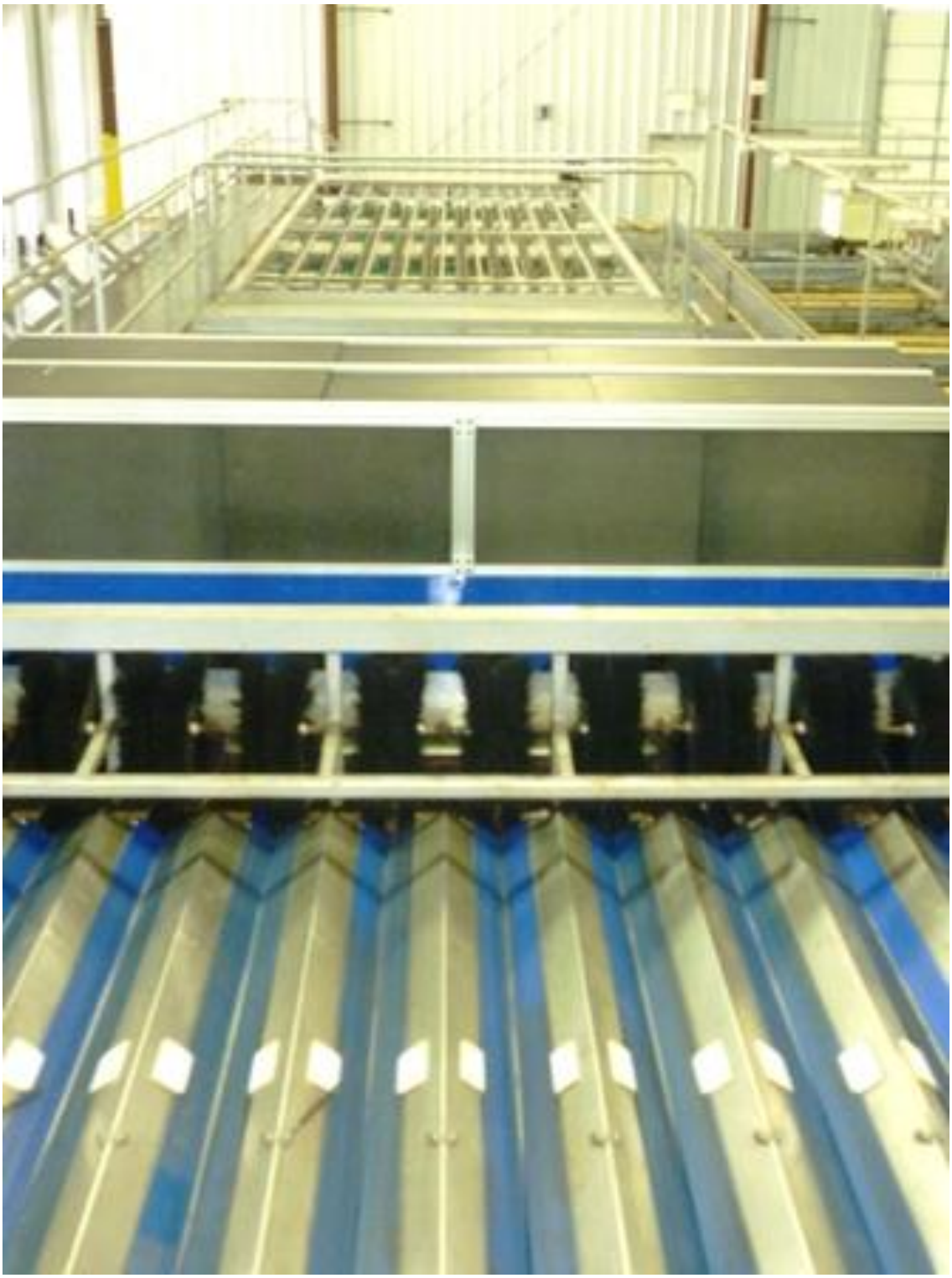

Figure 14. Electronic sizer. Source: Farmpak.
http://www.farmpak.com/index.php?option=com_content&view=article&id=2&Itemid=3

important role. E01 (2011), the international salesman for a large farming operation, noted that the foreign market did not exist for sweetpotatoes until the early 21st century, because shippers were not giving European consumers the right size sweetpotato. The electronic sizer "revolutionized" (PC03, 2011) the sweetpotato industry because it could give the consistency in size that was missing when "sweetpotatoes were hand packed [and brought] in from the field in a basket [where] people would take a rag and wipe them and lay them in a basket" (PC04, 2011). This especially aided the sweetpotato industry's growth in restaurants and foodservice. Once the exporters, and the buyers they sold sweetpotatoes to, learned that Europeans preferred certain sizes of sweetpotatoes, exporters were able to cater to importers' needs.

4.3.2 Sweetpotato varieties. Just like there are several types, or varieties, of apples, onions, and pears, so too are there numerous varieties, or cultivars, of the sweetpotato. Currently, a comprehensive collection of at least 8,000 sweetpotato accessions (1,000 of which are wild and thus a different, but related, species than the cultigen *I. batatas*) are stored at the International Potato Center in Peru (International Potato Center, 2010). Of the thousands of different sweetpotato varieties available, at least ten are grown in North Carolina. Of those, one variety, the Covington, now dominates the market. Figure 15 displays most of the sweetpotato varieties grown in North Carolina.

In addition to the varieties pictured in Figure 15, other varieties grown or grown in the past include: Jewel, Okinawas, Centennials, Pope, and Nuggets. During the course of conducting research, sweetpotato growers indicated certain varieties were still grown, at the very least for slips, which included all varieties pictured in Figure 15 as well as the Jewel. However, Covington is the dominant variety in the sweetpotato industry for fresh market and processing, while other varieties may be grown, due to request from buyers.

Figure 15. Sweetpotato varieties grown in North Carolina (Source: North Carolina Sweetpotato Commission: www.ncsweetpotatoes.com)

Freidberg writes about the natural qualities of commodities and how this affects how they are handled:

> "The natural qualities of specific foodstuffs…condition how such products can be traded, transformed, and otherwise handled, as well as how they are assigned monetary, social, and symbolic value in different societies and markets. These natural qualities are of course themselves subject to change over time, whether through evolution or purposeful modification. The point here is that they are woven into the cultural fabric of food commodity networks" (Freidberg, 2004: 11).

These qualities in the sweetpotato are purposefully manipulated by sweetpotato breeders in order to give the growers, the buyers, and the consumers what they want. A sweetpotato variety can determine which state is the leader in the sweetpotato industry, so the "natural qualities" selected during the breeding process are critical. Not all varieties are suited for all places. North Carolina's soil, climate, and weather conditions are different from the same factors in Mississippi and Louisiana and those are different from other countries.

When developing new sweetpotato varieties, at least 43 traits are considered (R03, 2011). However, some traits are fixed, while others are not fixed. Traits that are malleable are yield, insect and disease resistance, and, "probably the toughest" trait to select for, shape uniformity (R03, 2011). Even after traits are selected, there are still many years of work to complete before a variety can be released, including testing the potential variety in various locations to ensure the breeders selected varieties that are adapted to North Carolina's soils, ensuring the plants can sprout and be transplanted, and the reliability of a variety from year-to-year to produce the taste and color quality that the breeders want (R03, 2011).

An example of this purposeful manipulation is the Covington, which was developed in 2005, specifically with North Carolina's parameters in mind. This cultivar has propelled North Carolina forward in the domestic market and, of consequence for this paper, into foreign

markets. Today, the Covington variety is the dominant variety grown in North Carolina for several reasons -- the most important being the large number of sweetpotatoes that are grown from a single seed (or slip), shelf life, shape, and size.

While yield is extremely important to a grower—the more yield per acre, the more the grower can sell—what may be just as important is the "packing out" sweetpotatoes. The Covington has taken over the acreage in North Carolina, replacing the once-dominant Beauregard, developed by Louisiana State University in 1987. Part of the reason for this is due to the Covington out-packing (in other words, harvesting more sweetpotatoes within a certain weight and size range) the Beauregard. Arguably, the most significant trait of the Covington is its extended shelf life. The Covington can last on store shelves for a few weeks and has the ability to last through the 10 to 12 day travel time container ships typically take to reach Europe from the United States and remain in edible condition on the grocery store shelves (F01, 2011; PC02, 2011). However, the shelf life is still not long enough for sweetpotatoes to travel across the Pacific Ocean to Oceania or Asian countries.

Another advantage the Covington has in the international market over the Beauregard and other sweetpotatoes is its shape. One grower of specialty sweetpotatoes said the shape and size preferred by industry leaders is similar to a "beer can" (F08, 2011). While the plant breeders did not use those exact words, R02 (2011) did describe the Covington as having "a much shorter, controlled shape sweetpotato that looks a lot more like a potato in terms of appearance and size. So, I think it's done much better in the international market." All of these qualities, coupled with the involvement of the North Carolina Sweetpotato Commission beginning in 2005, and the involvement of numerous other organizations and agencies, have propelled North Carolina into the leadership role in the sweetpotato industry and a leading sweetpotato exporter in the world.

Another example of the importance of how natural qualities impact sweetpotato sales is the Jewel sweetpotato. One sweetpotato grower-packer-shipper grows the Jewel variety to sell to a potato chip company, because "it stays good and firm during the summer whereas these other varieties get peppy, the Jewel stays hard…just trying to give them a good quality sweetpotato during the month of August" (F05, 2011). These qualities, or traits, also affect which sweetpotato varieties are suitable for overseas trade.

One importer of sweetpotatoes, Barfoots, imports Beauregard sweetpotatoes from January to August and Jewel sweetpotato from August to January, because of the qualities that each offers during different times of the year. However, though not mentioned on Barfoots' website, at least one participant in this study exports Covington sweetpotatoes to Barfoots. Because many commercial varieties of sweetpotatoes are ill suited to European soils and climate, European countries are dependent on countries like the United States for their sweetpotato supplies. This has given North Carolina's sweetpotato industry access to many global markets.

Perhaps the most significant "natural quality" that changes over time and "woven into the cultural fabric" is the sweetness and texture of sweetpotatoes grown in North Carolina and throughout the United States (Freidberg, 2004: 11). There are many different varieties of sweetpotatoes which range in color, texture, and sweetness. The culinary cultural perception of the sweetpotato as it has developed within the United States and as it is constructed by United States' sweetpotato exporters in the international market is one of a sweet, moist, orange sweetpotato. While there are dry, unsweet, white or purple or red sweetpotatoes, part of marketing and selling sweetpotatoes exported from North Carolina and other states to other countries is continuing the perception that the "best" sweetpotatoes are orange, sweet, and moist.

By continuing to promote sweetpotatoes that look, taste, and feel a particular way, North Carolina has shaped, or at least attempted to shape, the global sweetpotato market. As globalization impacts certain aspects of NC's sweetpotato industry, it in turn is impacting the global market for sweetpotatoes. North Carolina's sweetpotato industry has affected consumers' perceptions and created challenges for other countries that export sweetpotatoes that do not fit this created image.

4.3.3 Changes in culinary cultural attitudes towards sweetpotatoes. Culinary cultural attitudes have shifted in the United States and in foreign markets towards sweetpotatoes. Food cultures do not stay the same, but shift over time. As discussed earlier, the sweetpotato was considered solely a holiday vegetable. However, due to promotional and marketing efforts by groups and individuals within the sweetpotato industry, the sweetpotato has begun to shift to an "everyday" food as opposed to a holiday food. This shift is still occurring, because there are still consumers who view sweetpotatoes as a food eaten solely during the holiday season (PC04, 2011). These groups and individuals have the same essential goal in promoting this shift: more capital flowing into North Carolina's sweetpotato industry and an increasing market share.

International consumers do not seem to have attached a stigma to the sweetpotato that it is a solely a holiday food. However, the sweetpotato was seen as an exotic vegetable and consumers in foreign markets were unsure how to cook or fit into their own daily meal plans. Today, due to promotion and education by several members of the state's sweetpotato industry, notably individual sweetpotato exporters, the NCSPC, and the North Carolina International Trade Office, Europeans now view the sweetpotato as a healthy vegetable to eat every day. This pressure from global markets has helped change the sweetpotato industry within North Carolina. While the market has slowly changed how sweetpotatoes are sized, market demands from

international buyers helped change how many sizes and weights are offered by sweetpotato exporters. Domestic buyers, arguably, were generally happy with a standard US #1 sweetpotato. However, international buyers—who knew their consumers wanted smaller portions than the standard America portion—showed that they can demand a smaller—or larger—size and be given that size.

4.4 North Carolina's Competition in the Global Sweetpotato Market

Before discussing competitors in terms of other states and countries, it is important to acknowledge at least two competitive edges that members in the North Carolina sweetpotato industry have over other actors in the global sweetpotato industry: controlled atmosphere storage facilities and the NCSPC. The ability to store sweetpotatoes in a controlled atmosphere allows for curing and extends their shelf-life. This helps in the international market, because most, if not all, competitors do not have storage facilities like those found in North Carolina. In addition, significant amount of money is spent by the NCSPC on international marketing. This means individuals within North Carolina's sweetpotato industry do not have to spend money on marketing. Instead, perhaps, money is directed to the costly storage facilities necessary to hold more sweetpotatoes.

Storage has given North Carolina growers a 'leg-up' competitively with other states and countries. R02 (2011) stated matter-of-factly, "We've got the best storage units in the world…It doesn't get any better than here." These storage buildings have been part of building the infrastructure necessary for sweetpotato growers to compete year-round and globally. Storage is especially helpful when marketing sweetpotatoes in countries that grow their own sweetpotatoes, such as Spain. This is because they do not have storage like North Carolina does and after "their last harvest, whatever is not en route to the stores, they have no more supply" (McIver, 2011).

Using Spain as an example (though it applies to several Western European countries), this provides North Carolina sweetpotato exporters an opportunity to sell their sweetpotatoes to Spanish buyers.

This also gives North Carolina sweetpotato exporters the opportunity to show consumers and buyers in countries like Spain the difference between their domestic sweetpotatoes and sweetpotatoes from North Carolina. Sweetpotatoes grown in various European countries are not cured whereas North Carolina's sweetpotatoes are cured, resulting in taste differences. Of course, there is the possibility that consumers in international markets prefer the taste of green sweetpotatoes. However, North Carolina sweetpotato exporters hope consumers who try cured sweetpotatoes will prefer those over green sweetpotatoes. These hoped-for results demonstrate that not only is globalization affecting North Carolina, but the larger sweetpotato market as NC actively tries to change the taste preferences of international consumers.

In the global sweetpotato market, North Carolina faces competition from several other states and a few countries, though right now neither are exporting at the same level as North Carolina sweetpotato exporters. When participants were asked the geographic location of their international competitors, several of the participants replied that their competitors were other sweetpotato growers within North Carolina (F03, 2011; F05, 2011; F06, 2011; PC02, 2011). In addition, participants view Mississippi, California, and Louisiana as competitors within the domestic market (F02, 2011; F03, 2011; F05, 2011; F06, 2011; F07, 2011).

There were participants who once exported sweetpotatoes, but no longer export as many sweetpotatoes due to competition. PC04 (2011) spoke about how his company, along with F01's company, had "developed some markets, developed some sizing, developed some pretty good things, then competition came in and started cutting prices, taking some of the value out of it for

us…We still do some, we still do Canada, we still do Puerto Rico, UK, and EU. We do ship some potatoes, it's just not a big part of our business" like it once was in the 1990s and early 2000s. In addition, "the dollar changed, the valuation of the dollar versus the pound" (PC04, 2011).[9]

North Carolina sweetpotato exporters do face competition from other countries in the global market. Out of the top ten sweetpotato exporting countries, only three countries, Israel, China, and France, export sweetpotatoes to one of the United States' target markets. As of 2008, the United States exported more to the shared targeted markets than the other sweetpotato exporting countries. The International Market Specialist at the International Trade Office clarified the data, stating that the Netherlands imports a significant amount of sweetpotatoes, but she estimated that about 80 to 90% of sweetpotatoes imported into the Netherlands are sold to other European countries, including Spain, Germany, and France (McIver, 2011).

The most significant competitor within the United States for North Carolina in terms of dollar amount of sweetpotatoes exported is California. This is not to say other states are not competitors for North Carolina, but Californian sweetpotato growers and packer-shippers are more aggressive in marketing their sweetpotatoes than other states. Figure 16 illustrates how the value of sweetpotato exports from North Carolina has risen in comparison to the second-largest sweetpotato exporter, California, from 1996 to 2010. Table 4 shows the export markets for California's sweetpotatoes. While there are a few overlapping countries both NC and CA export sweetpotatoes to, California generally exports its sweetpotatoes to different countries than North Carolina sweetpotato exporters. Out of the six countries California exported sweetpotatoes

[9] When the United State dollar is high compared with the currency of the receiving country, exporting becomes more difficult because the cost for that country to import a commodity is high.

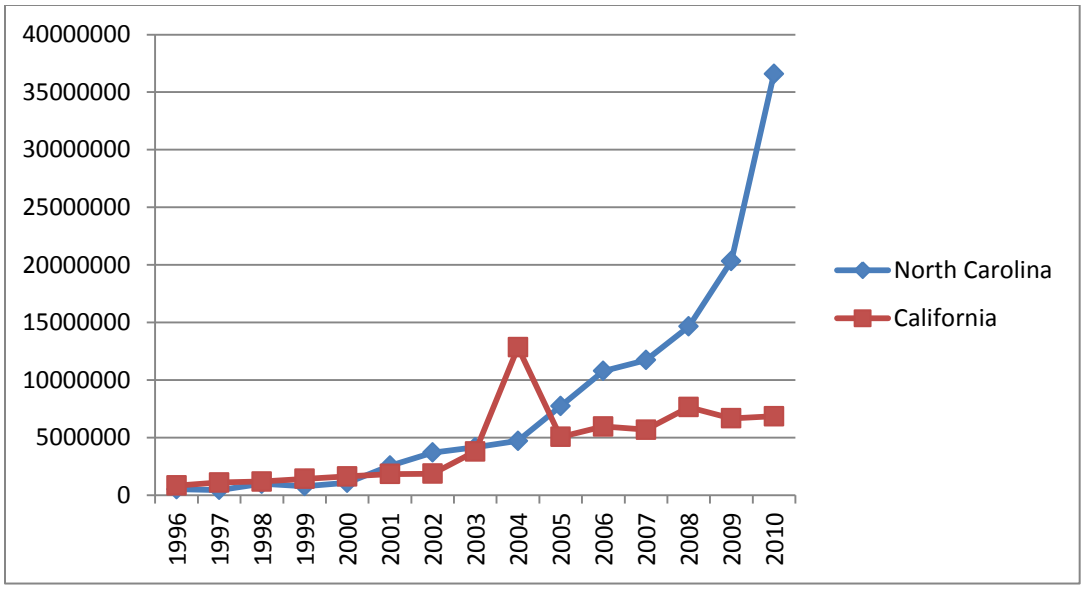

Figure 16. Exports in dollars of sweetpotatoes from North Carolina and California, 1996-2010. Source: http://www.wisertrade.org, data from U.S. Census Bureau Foreign Trade Division.

Country	1996	1997	1998	1999	2000	2001	2002	2003
Total All Countries	840,766.00	1,106,261.00	1,184,369.00	1,413,951.00	1,623,181.00	1,843,032.00	1,863,762.00	3,791,991.00
Canada	798,687.00	1,034,427.00	995,450.00	1,203,774.00	1,353,699.00	1,695,877.00	1,493,550.00	2,851,764.00
Mexico	3,289.00	-	17,310.00	66,910.00	108,842.00	97,254.00	132,881.00	182,360.00
Australia	-	-	-	-	7,140.00	-	96,637.00	59,827.00
United Kingdom	-	39,900.00	13,744.00	76,109.00	108,139.00	49,901.00	85,870.00	591,454.00
Coast Rica	-	-	-	-	-	-	-	-
Taiwan	-	-	151,930.00	20,100.00	-	-	-	-
United Arab Emirates	-	-	-	-	-	-	2,972.00	-
Korea, Republic of	-	13,372.00	-	-	-	-	27,210.00	-
Netherlands	-	-	-	7,465.00	-	-	10,842.00	-
Jordan	-	-	-	-	-	-	-	-
Ireland	-	-	-	-	-	-	-	-
Guatemala	-	-	-	-	-	-	-	14,222.00
Israel	32,576.00	-	-	-	-	-	-	-
Singapore	-	-	5,935.00	-	-	-	-	-
Switzerland	-	-	-	-	-	-	-	47,659.00
France	-	-	-	-	-	-	1,100.00	34,825.00
Sweden	-	18,562.00	-	7,132.00	-	-	-	-
Hong Kong	-	-	-	15,609.00	12,600.00	-	-	-
Dominican Republic	-	-	-	16,852.00	32,761.00	-	-	-
Germany	-	-	-	-	-	-	2,760.00	3,060.00
China	-	-	-	-	-	-	-	6,820.00
Marshall Islands	6,214.00	-	-	-	-	-	-	-

Country	2004	2005	2006	2007	2008	2009	2010
Total All Countries	12,838,357.00	5,067,666.00	5,963,093.00	5,680,061.00	7,644,528.00	6,671,752.00	6,852,249.00
Canada	12,065,668.00	4,095,770.00	5,120,381.00	4,264,423.00	4,844,011.00	5,838,901.00	5,859,401.00
Mexico	242,762.00	256,718.00	235,840.00	248,605.00	479,462.00	288,709.00	444,565.00
Australia	65,558.00	50,914.00	59,502.00	167,281.00	155,921.00	254,728.00	180,839.00
United Kingdom	457,312.00	664,264.00	544,682.00	620,482.00	1,619,570.00	118,095.00	255,862.00
Coast Rica	-	-	-	-	-	-	-
Taiwan	7,057.00	-	-	-	-	158,803.00	106,062.00
United Arab Emirates	-	-	-	-	-	-	5,520.00
Korea, Republic of	-	-	-	345,765.00	-	12,516.00	-
Netherlands	-	-	-	33,505.00	501,129.00	-	-
Jordan	-	-	-	-	34,315.00	-	-
Ireland	-	-	-	-	10,120.00	-	-
Guatemala	-	-	-	-	-	-	-
Israel	-	-	-	-	-	-	-
Singapore	-	-	2,688.00	-	-	-	-
Switzerland	-	-	-	-	-	-	-
France	-	-	-	-	-	-	-
Sweden	-	-	-	-	-	-	-
Hong Kong	-	-	-	-	-	-	-
Dominican Republic	-	-	-	-	-	-	-
Germany	-	-	-	-	-	-	-
China	-	-	-	-	-	-	-
Marshall Islands	-	-	-	-	-	-	-

Table 4. Annual dollar amount of sweetpotatoes sold to different countries from California, 1996-2010. Source: http://www.wisertrade.org, data from U.S. Census Bureau Foreign Trade Division.

to in 2010 and the seven countries that North Carolina exported sweetpotatoes to, the only countries both states shipped sweetpotatoes to were Canada and the United Kingdom.

There are four countries that participants mentioned as serious competitors for North Carolina's sweetpotato exporters in the global sweetpotato market. The first country mentioned is China. PC03 (2011) predicted that "eventually potatoes will be coming out of China." As Table 3 shows, China's main customers are not target markets of NC: Japan, Hong Kong, and Korea. It does export to the Netherlands, United States, and Canada, but the sweetpotatoes are different varieties—typically varieties that are white-fleshed and drier—than what is exported from and consumed within the United States. This means the consumer base for those sweetpotatoes is different and, in the United States, much smaller than the consumer base for the sweeter, orange-fleshed varieties produced in the United States.

The International Marketing Specialist at the NCDA International Trade Office did not consider China a serious competitor. She gave two reasons for her assessment: 1) a stigma was attached to sweetpotatoes within China; and 2) the variety was not what most consumers expected when they thought of "sweetpotato." In addition to the different texture and taste, sweetpotatoes in China were associated with hunger and famine by older generations, because until recently, sweetpotatoes were a part of the daily meal of the Chinese who lived in poverty, resulting in a stigma. North Carolina is, in a sense, tailoring Europeans' taste preference for the sweet, orange-fleshed sweetpotato varieties. This may result in Europeans choosing orange-fleshed varieties over white-fleshed varieties, thus hindering Chinese varieties if China was to choose to enter the European market, unless the Chinese can either convert the taste preference or develop a variety that offered similar traits.

Participants mentioned two other countries that were exporting sweetpotatoes: Egypt (PC03, 2011) and Israel (F03, 2011; F05, 2011). PC03 (2011) commented that "poor quality comes out of Egypt." F03 (2011), whose company exports about 70% of its sweetpotatoes, characterized the Israeli sweetpotato industry as "very much like us, their labor force, input costs, very similar to us." One buyer of United States' sweetpotatoes in the United Kingdom, Barfoots, imports the Jewel variety of sweetpotatoes from Israel from August to January, because the Jewel "has adapted well to growing conditions and can be exported quickly to the UK, reducing quality issues such as rot" (Barfoots, 2011).

The case of Barfoots demonstrates how a corporation maintains suppliers across the globe in order to stay competitive. The distance between North Carolina and target countries may be the biggest obstacle facing North Carolina sweetpotato exporters. The only way to shorten the time it takes for a commodity to travel from North Carolina to the United Kingdom is to ship the sweetpotatoes via airplane, but that is too costly to be a long-term feasible option. However, as North Carolina sweetpotato exporters push the Covington in Europe, they may cut into Israel's share of the sweetpotato market at Barfoots.

The fourth country mentioned by participants is Honduras. F03 (2011) described Honduras as "very different from us. Their input costs, much lower. They can grow two crops a year to our one. They have a lot of advantages that we don't have and they can be a real thorn in your side, because we're not dealing with the same thing." Another participant who is heavily involved in exporting sweetpotato, PC01 (2011), described the competition from Honduras: "The [U.S] state department (sic)—I'm all about competition, but I'm not particularly excited when they, the [U.S] state department (sic), go down and get, essentially pay for a co-op and get Hondurans growing sweetpotatoes. And the reason I say this, if they're going to help them with

mangos" or another crop that North Carolina cannot grow that is acceptable. PC01 understands helping Hondurans, because it is important to help nations like Honduras, but to help create an industry that directly competes with the United States sweetpotato industry, he found puzzling.

However, the program PC01 spoke of is not under the U.S. Department of State. The program that has propelled Hondurans into the global sweetpotato market is the United States Agency for International Development (USAID) which is an independent agency that receives guidance from the United States Secretary of State. USAID has assisted Honduran farmers since 2000 with

> "marketing, post harvest (sic) handling, production, processing and technology. In sweet potatoes, USAID saw an opportunity for small growers to take advantage of the potential for export to nontraditional markets. USAID identified buyers in the Netherlands and Canada and began working with a group of small farmers" (USAID, 2009).

North Carolina sweetpotato farmers, and probably sweetpotato farmers throughout the United States as well, have also targeted Canada and Netherlands as markets to export sweetpotatoes. The fact that a United States federal agency is assisting the competition, with North Carolina sweetpotato actors' tax dollars, is unsettling for sellers of sweetpotatoes in North Carolina.

Kelly McIver (2011) of ITO did not expect Honduras to be a competitor "until I visited Spain and they were all over the market. That was the first time I had seen them internationally. So, I consider them a threat now." As of 2008, Honduras exported 6,480 metric tons of sweetpotatoes, which accounts for less than 4% of the world sweetpotato exports. While Honduras may be a small player right now in the global sweetpotato economy, this can change. This is an important effect globalization has on NC's sweetpotato industry: as USAID exchanges technology and knowledge with Honduran sweetpotato growers, giving them access

to global markets, NC's sweetpotato exporters have gained a new competitor, which may affect their abilities to sell sweetpotatoes internationally.

4.5 Summary of Findings

North Carolina has exported sweetpotatoes at least since 1996, (the earliest year data are available), but only in 2005 did it become the leading sweetpotato exporter in the United States. In 2009 and 2010, North Carolina saw a significant increase in the total US $ value of exported sweetpotatoes and in the percentage of North Carolina sweetpotatoes exported that account for total US sweetpotato exports. While these numbers reflect the increased presence of North Carolina and the United States in the global sweetpotato economy, they do not tell us the whole story of how globalization has affected North Carolina's sweetpotato industry.

Here it is best to refer to what the participants said about the changes that have occurred within the industry, often as a result of attempting to penetrate foreign markets. There are five significant effects of globalization that stand out in the findings. These include: expansion into new markets; technological changes; how the sweetpotato is grown and treated; changes in culinary culture surrounding the sweetpotatoes; and who are the competitors to North Carolina's exported sweetpotatoes. First, North Carolina had focused sweetpotato sales within the domestic market to as late as 1996, but in 1996 exported sweetpotatoes to the United Kingdom and Canada. By 2010, North Carolina exported sweetpotatoes to at least seven countries.

Second, due to the expansion into new markets, sweetpotato growers and packer-shippers invested significantly in technology that allowed for year-round storage of sweetpotatoes, electronic sizers that helped sweetpotato exporters meet the requirements in size and weight specified by foreign buyers, and trace-back technology in order to trace the sweetpotato from the field it was planted in to the consumer who purchases the sweetpotato. Third, due to food

standards that must be met in order to export sweetpotatoes into the European Union, growers and packer-shippers must invest in trace-back technology, document every aspect of chemical applications made to the sweetpotato, only choose chemical inputs from an approved list, and meet other requirements dictated by buyers and certification boards. Many of these requirements may have eventually entered the sweetpotato industry, but globalization has hastened their entry in order for sweetpotato exporters to even be allowed to ship their sweetpotatoes to many countries.

Fourth, since many countries throughout the world view sweetpotatoes differently, globalization has allowed sweetpotato growers and exporters to market and promote the sweetpotato as a vegetable that is available year-round and can be used in a variety of ways. This is seen in Western Europe, where the sweetpotato pie was virtually unheard of, but is now being introduced by American sweetpotato exporters and organizations that promote the sweetpotato in foreign countries. Finally, globalization has even affected the competitors that North Carolina sweetpotato exporters face in the global market. The United States Agency for International Development has assisted direct competitors of United States' and North Carolina's sweetpotato exporters in efforts to help those countries gain access to new markets. This has affected North Carolina sweetpotato exporters to some degree and as these competitors become more skilled in sweetpotato exporting, North Carolina sweetpotato exporters may face serious competition in foreign markets. Just like USAID assists sweetpotato growers in other countries, there are many other organizations and governance institutions that play significant roles in North Carolina's sweetpotato industry and are explored in the next chapter.

CHAPTER FIVE: THE ROLES OF ORGANIZATIONS AND STATE AGENCIES IN THE SWEETPOTATO COMMODITY CHAIN

In addition to the obvious players within North Carolina's sweetpotato industry (growers, packer-shippers, buyers, and consumers), there are several organizations that are actively involved in NC's sweetpotato industry. These organizations are either part of the state government explicitly or derive their power from the state government. They have also provided the ability to perform research and development in the sweetpotato industry, promote and market sweetpotatoes, and help exporters or potential exports understand the international markets for sweetpotatoes.

Friedland notes that while the state shows up in commodity analyses, "its role has been more implicit than explicit" (2001: 96). Reviewing literature of commodity analyses since 2001 shows that little has changed in this respect. There is commodity chain literature concerning the role of the state in countries that are transitioning industries from a state-controlled approach to one where companies within industries are privately owned. For example, literature does exist on state-owned farms transferring ownership to private individuals/companies.

This is slightly different from the United States' agricultural context, in which farmland is privately-owned. However, some farming operations receive subsidies from the United States government when they plant certain crops and apply for these subsidies. The sweetpotato industry in North Carolina has benefited from this indirectly, because many sweetpotato growers are or were tobacco growers or grow another subsidized crop. As mentioned in Chapter Two, tobacco growers benefited from the tobacco buyout program. Many farmers used the money from the tobacco buyout and funneled it into other crops in their operation, such as the sweetpotato.

Busch wrote that "the role of the State has changed and perhaps diminished. Nation-states are now far less likely to regulate directly" (2007: 439). In fact, Busch argues that firms within supply chains view state policies, regulations, and laws as "either obstructions or lubrications for the flow of goods in the chain and policies to be challenged or supported in executive, legislative, and judicial settings" (2007: 455). This is why the "state should never be taken for granted" (Friedland, 2001: 96), because whether or not firms like it, the nation-state structure and its institutions are seen everywhere in modern capitalistic societies and are likely not to go anywhere.

There are those, like Busch (2007), who argue that state agencies' influence is increasingly eroded by globalization. As the organizations below demonstrate, state agencies are finding new ways to become involved in the global market and not lose their relevance. State and national government agencies and organizations working with the government have diplomatic relations and connections, making these agencies and organizations necessary to participants in the sweetpotato commodity chain, at least at the entry-level into the global market. Until actors within the sweetpotato commodity chain are well-known in their target markets, they often participate in programs that are provided by these government agencies and organizations to boost their recognition in these markets.

There are several organizations that assist members of North Carolina's sweetpotato industry, both in domestic and international markets. I examine two of these in-depth in this study: the North Carolina State University (NCSU) and the North Carolina Sweetpotato Commission (NCSPC). There are other agencies that have roles within the sweetpotato commodity chain, including: the North Carolina Department of Agriculture and Consumer Services' International Trade Office (ITO), the United States Department of Agriculture

(USDA), and the Southern United States Trade Association (SUSTA). I examine these later in the chapter.

5.1 North Carolina State University

5.1.1 Departments involved in sweetpotato research. North Carolina State University was founded in 1887 as a land-grant institution. It has evolved into a research and extension university, arguably best known for its agricultural, engineering, and science programs. The following is a list of departments that are involved in some aspect of the sweetpotato industry:

1) Agricultural and Resource Economics;
2) Biological and Agricultural Engineering;
3) Entomology;
4) Food, Bioprocessing, and Nutrition Science;
5) Plant Pathology;
6) Horticultural Science.

Due to time constraints (as well as scheduling conflicts with researchers, as many professors have their own research to conduct which limits their time), only three researchers from North Carolina State University were consulted for this study, one from the Department of Agricultural and Resource Economics and two from the Department of Horticultural Science. These departments are important when discussing the effects of globalization on North Carolina's sweetpotato industry, because their research on sweetpotatoes (along with other universities' programs throughout the country that are researching sweetpotatoes) has contributed to sweetpotato growers' and packers' ability to sell internationally.

Each department brings valuable knowledge and expertise to North Carolina's sweetpotato industry. I want to briefly discuss each, with a more extensive examination of the

Department of Horticultural Sciences in the next section. The Department of Agricultural and Resource Economics aids in farm budgets, taxes, insurance, and a multitude of other economics related aspects of a farming operation (NCSU, 2011a). The Department of Biological and Agricultural Engineering assists sweetpotato actors with a variety of issues related to water resources, waste management systems, controlled atmosphere environments, and specialized equipment and storage facilities (NCSU, 2011b).

The Department of Entomology assists the sweetpotato industry through its research on insects that are predators to the sweetpotato and providing solutions for insect pest control that is both basic (long-term) and practical (short-term) (NCSU, 2011c). The Department of Food, Bioprocessing, and Nutrition Sciences researches processing and new product development for the sweetpotato. Specifically, research projects related to the sweetpotato that have been or are currently conducted include: determining optimal processing conditions to prevent or minimize losses occurred during processing; the effects of processing and storage on the chemical properties of products derived from sweetpotatoes; "identification and stability of sweet potato components that lower blood glucose;" and how a type of drying, spray-drying, of sweetpotatoes affects powder functionality of sweetpotato purees (NCSU, 2011d).

The Department of Plant Pathology contributes to the sweetpotato industry through research on micro-propagation and disease control. Through their research, the Department of Plant Pathology's goal is to mitigate "crop loss due to plant disease through multiple approaches that are ecologically-based and sustainable" (NCSU, 2005). This brings us to the Department of Horticultural Sciences, which contributes to the sweetpotato industry through a variety of research programs focusing on sweetpotato production. Specifically, I focus on the plant breeders who develop sweetpotato varieties, which is discussed next.

5.1.2 The importance of plant breeders to North Carolina's sweetpotato industry. All of the scientists and researchers involved in sweetpotato research contribute valuable knowledge and techniques to the sweetpotato industry as a whole and particularly North Carolina's sweetpotato industry. Scientists, working in tandem, have helped increase sweetpotato consumption and expanded the sweetpotato market both domestically and internationally. The plant breeder in particular has aided NC's sweetpotato industry access global markets. One participant stated that "varieties are very important, because you've got to keep coming up with new varieties, storage techniques, harvest techniques; NC State is really the heartbeat of the sweetpotato industry" (PC04, 2011). While the sweetpotato industry has numerous storage facilities, has acquired vast amounts of knowledge about the use of pesticides, and has learned the best way to harvest sweetpotatoes, without the varieties developed by plant breeders, none of that matters. If a quality sweetpotato cannot be grown and sold, the rest is for naught.

Two scientists in the plant breeding program were interviewed for this study. They were also the developers of the Covington sweetpotato variety that now dominates North Carolina sweetpotato fields. The plant breeders are primarily focused on developing new sweetpotato varieties suitable to North Carolina's climate, soil, and weather conditions. In addition, the plant breeders are developing sweetpotato varieties that have traits which will allow them to remain intact nutrion- and taste-wise after going through processing.

If North Carolina's sweetpotato industry did not have its own breeding program, along with other departments housed at NCSU, more than likely no one would develop varieties suitable to North Carolina (F04, 2011; F06, 2011). This is because NCSU arguably has the strongest sweetpotato plant breeding program in the nation. While other states may dabble in sweetpotato plant breeding and Louisiana State University does have a sweetpotato plant

breeding program, these programs do not have the strength of NCSU's plant breeding program with its funding and sweetpotato breeders. NCSU receives funding from a number of sources: grants, an endowment fund set up by the North Carolina Sweetpotato Commission (discussed in a later section), NCSU funds to the Department of Horticulture, state and federal grants allocated through the North Carolina Agricultural Research Service, North Carolina Agricultural Foundation, and a portion of the royalty fees generated from the Covington variety and any other variety the breeding program may produce (R02, 2011; R03, 2011; F06, 2011; NCSPC, 2010f; NCSPC, 2011; NCSU, 2011e).

As discussed earlier, sweetpotato growers of North Carolina have exported to international markets since at least 1996. However, significant sweetpotato exports (in US $) from North Carolina did not occur until after 2005. During the 10-year period between 1996 and 2005, NC sweetpotato exports increased from USD 512, 737 to USD 7,726,962, a difference of USD 7,214,225. During the five-year period between 2005 and 2010, sweetpotato exports increased from USD 7,214,225 to USD 36,588,127, a difference of USD 28,861,365, four times the amount of sweetpotato exports than the increase between 1996 and 2005. While part of this significant increase in sweetpotato exports can certainly be attributed to aggressive promotion and marketing of the sweetpotato in foreign countries, 2005 is also the year that three important events occurred for North Carolina. One was already discussed—the tobacco buyout—another will be discussed (the role of the NCSPC), and the third is the release of the Covington sweetpotato variety.

There have been a number of sweetpotato varieties developed, but not every variety is suitable for every climate. Prior to the development of the Covington in 2005, the shipment of Beauregard and other sweetpotatoes across the Atlantic was considered risky by researchers and

sweetpotato packer-shippers alike (R03, 2011). The Covington reduced this risk significantly with its extended shelf-life of at least two weeks, according to sweetpotato researchers, growers, and shippers. With the Covington able to survive the trans-Atlantic transit from North Carolina to European supermarkets, European produce buyers were reassured that the sweetpotatoes they purchased would still be edible by the time consumers bought and prepared them. The Covington provided security and confidence in the sweetpotato that buyers needed to purchase sweetpotatoes in the large amounts they have since the release of the Covington. Without the plant breeding program at the Department of Horticultural Science the Covington, specifically designed to North Carolina's weather, soil, and climate, probably would not exist today.

Part of breeding new sweetpotato varieties also means ensuring it is virus-indexed and knowing which PPPs are effective and how much to apply to the crop. Just these two aspects of breeding sweetpotatoes meant involving two other departments at NCSU: entomology and plant pathology. This demonstrates the importance of NCSU's programs for North Carolina's sweetpotato growers. Participants in this study, like the one earlier who described NCSU as the heartbeat of the sweetpotato industry, provided their own views of NCSU's involvement in the sweetpotato industry, which is discussed next.

5.1.3 Views on NCSU from participants. Almost every single participant echoed the same sentiment: without North Carolina State University, the North Carolina sweetpotato industry would not exist as it does today. PC04 (2011) described North Carolina State University as "the heartbeat of the sweetpotato industry." One participant stated that "without it, we will start cycling down" (F04, 2011), and two other participants firmly believed that "without the university, we're out of business" (PC03, 2011) and "without it, we don't exist" (PC04, 2011).

The sweetpotato industry in North Carolina, or at least its leaders, found NCSU so vital to the industry that an endowment fund—renamed in 2007 to the Henry M. Covington Endowment for Excellence in Sweetpotato Research and Extension—was created and is actively seeking to grow its endowment to more than one million dollars in order to use the interest to support research on sweetpotatoes (NCSPC, 2011: 11; F04, 2011). The research and development conducted by NCSU researchers on the sweetpotato provides information and technology at several segments in the SPCC, including propagation, planting, harvesting, and post-harvesting. This information and technology enables sweetpotato growers and sellers of sweetpotatoes to expand domestically and internationally.

As discussed earlier, one of the changes that occurred in the sweetpotato industry was the ability to cure and store sweetpotatoes for up to 13 months, which allowed year-round selling of sweetpotatoes. This was largely pushed by NCSU sweetpotato researchers, particularly Henry Covington (R03, 2011; PC04, 2011). Due to the efforts of these researchers, sweetpotatoes are stored for over a year, providing a stable source for sweetpotatoes year round. Participants noted several times the importance of this research to North Carolina's sweetpotato industry. The R&D conducted at NCSU, according to participants, is invaluable to the expansion of North Carolina's sweetpotato industry and its push into foreign markets. While there are differing opinions voiced about the North Carolina Sweetpotato Commission, discussed in the next section, when it came to North Carolina State University every participant believed that it provided an invaluable service to North Carolina's sweetpotato industry.

5.2 North Carolina Sweetpotato Commission

If North Carolina State University is the heartbeat of the sweetpotato industry, then the North Carolina Sweetpotato Commission is the brain. The North Carolina Sweetpotato

Commission is the force behind many initiatives, programs, and changes within North Carolina's sweetpotato industry. North Carolina Sweetpotato Commission, Inc is a non-profit organization (IRS 501 [c] 5) that was chartered in June of 1961 by fifty sweetpotato growers, who originally named the organization the North Carolina Sweetpotato Association, Inc (NCSPC, 2010a; NCSPC, 2011: 2).

Today, membership in the NCSPC has increased to over 450 growers, packer-shippers, brokers, processors, and business associates. While there are members who aren't growers in the North Carolina Sweetpotato Commission, only growers have voting rights at the annual meeting to determine the Board of Directors and other issues brought to the membership. There is an executive director for the North Carolina Sweetpotato Commission, but decisions are made by the Board of Directors, which is comprised of growers and, usually, but not always, a representative from a processing company (F01, 2011).

According to the current executive director of the NCSPC, Ms. Sue Johnson-Langdon, the charter of the organization charged the NCSPC, its board, and its executive director with the responsibility of "promot[ing] the consumption of sweetpotatoes. We are to promote the efficient usage of good horticultural practices, the usage of good seed; we do not do marketing as far as sales. However, we promote by creating awareness of sweetpotatoes, of their availability, their nutritional benefits, and all things sweetpotatoes" (Johnson-Langdon, 2011). In addition, the NCSPC is involved in monitoring legislation at both the state and national levels. This legislation includes: legislation of agriculture in general (because sweetpotato growers grow a multitude of crops); labor; food safety; and water rights (Johnson-Langdon, 2011). For example, the NCSPC has helped with "insurance designation, like for workers' compensation, because of

the safety record of sweetpotatoes…so we went to bat on those things" (Johnson-Langdon, 2011).

There is also a grant-seeking and grant-making arm to the NCSPC, the North Carolina Sweetpotato Foundation. The NCSPCF is a "grant recipient and management entity" that received funding from North Carolina's Golden LEAF Foundation (NCSPC, 2011: 3). The NCSPCF is involved in the sweetpotato industry in a number of ways, including working with sweetpotato researchers, consumer preferences analysis, proactively seeking manufacturers to increase the processing side of sweetpotatoes, and conducting searches for funding opportunities to fund sweetpotato projects that benefit North Carolina's sweetpotato industry and consumers (NCSPC, 2011: 3). It is involved in the development of technology to increase traceability capabilities (NCSPC, 2011: 3) that will ultimately help North Carolina's sweetpotato industry as it expands in processing and exports.

In a brochure sent out to North Carolina sweetpotato supporters, the executive director of NCSPC wrote in a brief article that she had "checked the box" on several goals of the organization listed in the charter (NCSPC, 2010f). These goals that she had "checked the box" on include: increasing production; expanding the market; marketing and promotion; increasing consumption; supporting research and education; and monitoring and reacting to legislation (NCSPC, 2010f; NCSPC, 2011: 3). Figure 17 illustrates where the NCSPC sees itself in relation to the various actors involved in the sweetpotato industry. Because the NCSPC does indeed provide the services described, it has become a crucial link in the sweetpotato commodity chain, one that is connected to every actor along the SPCC. It is a link that has shepherded North

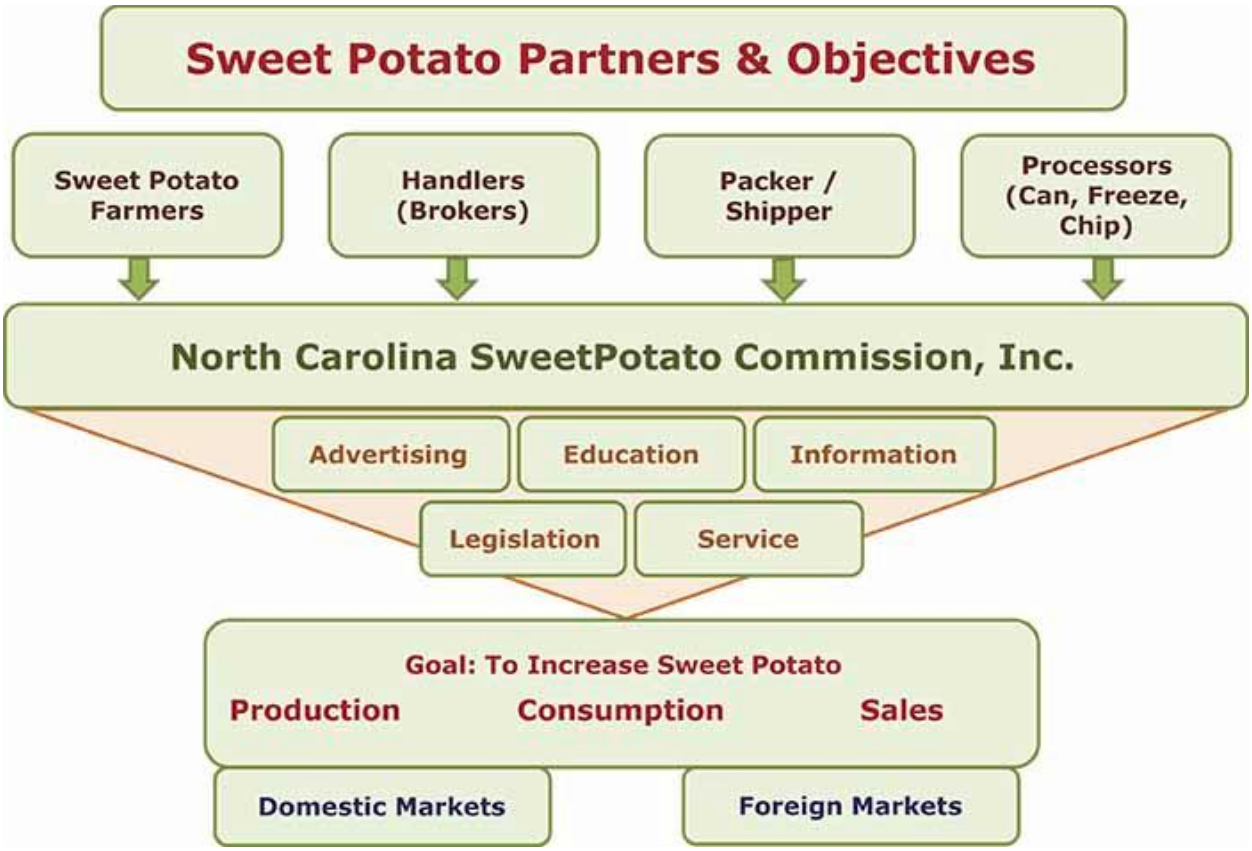

Figure 17. Sweetpotato Partners and Objectives. Source: NC Sweetpotato Commission, http://www.ncsweetpotatoes.com/sp-varieties/186.html, 2010.

Carolina into the global market and which has helped its members as North Carolina's sweetpotato industry has become increasingly globalized.

The North Carolina Sweetpotato Commission is funded through assessments gathered from growers (hence why only growers can vote). The assessment is US $15 per planted acre of sweetpotatoes. Before the general statute that required the fee was enacted (GS 106-564.4, see Appendix B for this and other relevant statutes), in order to collect assessment fees the NCSPC relied on voluntary contributions. The voluntary contributions were "more difficult to verify and have not been successful" (F01, 2011).

Since the general statute was enacted, the NCSPC was able to determine the acreage of sweetpotatoes grown by each grower through cooperation with the USDA Farm Service Agency (FSA) (F01, 2011). Farming operations report their acreage for each crop to the FSA for tax purposes; information on sweetpotato acreage is then given to NCSPC in order to properly assess the fees. According to members of the NCSPC and a publication by the NCSPC, the assessment fee allowed the organization to promote the sweetpotato, as well as provided funds for research and education (F01, 2011; F02, 2011; F03, 2011; F05, 2011; PC02, 2011; PC03, 2011; NCSPC, 2011: 4). It is through the assessment fee that the NCSPC becomes an agent of the state. Mandated by state law, the assessment fee provides funding and power within the SPCC.

Since the NCSPC is funded almost entirely by the assessments collected from growers, a former member of the Board of Directors believes that the executive director has "the growers' interests at heart…she knows that the growers are paying the money, the packer don't have any sweetpotato acres, he's not putting any money to it. She keeps that in focus" (F05, 2011). This is important for the NCSPC to remain a cohesive industry group, as well as remain an important actor within the sweetpotato industry and North Carolina's expansion into international markets.

F06(2011) said, the NCSPC "allows our industry to speak as one unified voice, one place to go to, one source for answers, for information, one source that sort of leads us as an industry in our marketing efforts." This has been instrumental in expanding North Carolina's SPCC from a short chain consisting mostly of domestic sales to a long and complex commodity network that includes foreign markets and many more segments and actors. This also means that the NCSPC can exert control over information given to growers. As will be shown later in this chapter, some growers question the NCSPC because of its close association with the largest sweetpotato growers.

There are two main drivers to the expansion of sweetpotatoes in general and North Carolina's sweetpotatoes in particular: processing sweetpotatoes and exporting sweetpotatoes. Through the marketing efforts of the NCSPC (and others), the NCSPC has helped give the sweetpotato exposure in the media and at trade shows (F02, 2011; PC03, 2011; PC04, 2011). F06 (2011) noted that "it took a lot of effort from individuals, but if the commission hadn't gotten involved [in international marketing of sweetpotatoes], we wouldn't be able to sell sweetpotatoes like we are now. I don't think we would be here without the commission."

The NCSPC officially became involved in promoting and marketing to foreign markets in May 2005, the same year that North Carolina became the leading state in exporting sweetpotatoes (NCSPC, 2011: 8). The combined efforts of individual packer-shippers and the NCSPC resulted in developing access to global markets. This harkens back to Francis's (2000) argument that markets are human-made constructions. Through the efforts of private individuals, companies, and agencies, access to the markets in various European countries was created for North Carolina sweetpotatoes. In addition, NAFTA eased trading with Canada, a

large export market for North Carolina sweetpotatoes, by eliminating tariffs and reducing the costs of international trade.

5.2.1 The NCSPC and culinary culture. The North Carolina Sweetpotato Commission played a significant role in changing the perception of sweetpotatoes in the US from a holiday food to an "everyday" food. When participants were questioned on how this shift occurred, several participants pointed to the NCSPC for pushing sweetpotatoes on to plates every day of the year (F04, 2011; F05, 2011; F06, 2011; F07, 2011; PC02, 2011; and PC04, 2011). This was done through the same means used to promote sweetpotato internationally, including pushing sweetpotatoes into the major steakhouses. Many participants argued that due to the sweetpotato becoming part of restaurants' regular menus, consumers were able to see different ways to prepare sweetpotatoes at home.

PC04 (2011) credits the NCSPC with "getting the ear of somebody," a mythical "someone" who individual sweetpotato growers and packers were unable to persuade and one that PC04 could not identify (though I hypothesize that this "someone" is really the media, which the NCSPC has significant access to through the efforts of the executive director). F07 (2011) stated that the NCSPC is a powerful group that has promoted sweetpotatoes extensively, which has helped transform the sweetpotato in consumers' minds. F06 (2011) credited a successful marketing strategy spearheaded by the NCSPC, whose strategy included pushing sweetpotatoes into foodservice and restaurants and educating consumers on the health benefits of sweetpotatoes (see Appendix for health benefits of sweetpotatoes).

Though the United States has recently embraced sweetpotatoes outside the holidays (as recently as 2007, the Wall Street Journal declared the sweetpotato dead after the holidays), the NCSPC considers the sweetpotato market in the United States a "mature market." A "mature

market" is one in which an increase in sweetpotato consumption is unlikely unless consumption in another commodity decreased and was replaced with sweetpotatoes (Johnson-Langdon, 2011). While there is still opportunity in the United States for sweetpotatoes, especially on the processing side, growth in the fresh market side of sweetpotatoes may have reached its peak (it is beyond the scope of this thesis to definitively conclude this, but by which some participants meant that it is unlikely that American consumers will significantly increase their consumption of sweetpotatoes).

The NCSPC, along with several members of the sweetpotato industry, has turned to the export market, because Europeans "are beginning to expand in consumption" (Johnson-Langdon, 2011). By increasing sweetpotato exports to foreign markets, North Carolina sweetpotato exporters, in conjunction with NCSPC and other state agencies, are striving to make the North Carolina sweetpotato commonplace in foreign markets. Globalization has helped the NCSPC assist North Carolina sweetpotato exporters break into foreign markets by taking advantage of globalization's compression of space and time through the internet, where its website heavily markets and promotes NC sweetpotatoes domestically and internationally.

Through the internet and NCSPC's presence on the web, North Carolina sweetpotato farmers have access to international produce buyers that may not have ever had access to this information without the NCSPC. The internet has given the sweetpotato industry access to global markets and facilitated the exchange of knowledge and information of sweetpotatoes between sellers and buyers. NCSPC's website is often the tool used by buyers and exporters of sweetpotatoes to connect, bringing global actors into the local economy of North Carolina's sweetpotato industry. This results in the "global meeting the local," by increasing the demand

for sweetpotatoes, which resulted in sweetpotato acreage increases, bringing more money and jobs to farming operations, communities, and employees.

Part of globalization's effect on North Carolina's sweetpotato industry is also North Carolina's ability to interact with markets in other nations. This includes adapting the sweetpotato to a variety of food (culinary) cultures. Understanding the role of culinary culture in food commodity chains is important to the success of a commodity in different markets, especially in countries that have experienced food scares like the ones experienced in the United Kingdom and on the European continent in the past (Freidberg, 2004: 6-9). Food scares have made European consumers wary of the "quality" of food, resulting in food standards such as GLOBALG.A.P. and retailers' private certifications, like Tesco's Nature's Choice. As the NCSPC pushes sweetpotatoes in international markets, the relationships between the actors promoting, marketing, and selling sweetpotatoes and the actors buying the sweetpotatoes is constantly evolving and shaping each other's interactions.

NCSPC, due to a "limited budget" (Johnson-Langdon, 2011) has decided to focus its efforts on a few, key countries. These include: the United Kingdom, Germany, Denmark, France, Spain, and Sweden (Johnson-Langdon, 2011; NCSPC, 2010f). Sampling events are conducted in these countries, often in partnership with other organizations or government agencies, such as the NCDA&CS. Ms. Johnson-Langdon (2011) recognized the importance of adapting the sweetpotato to a global cuisine, tailoring it to the local culinary culture of the country:

> "Because the cultures are different and the ingredients sometimes are different, then you can't just take American recipes and convert them to metrics and [the recipe] work. We've found that it's better if…a food person from that country helps us to create recipes that…they will be interested in using…We found that it varies all

> over the world. You get further buy-in if you will develop recipes and marketing strategies that speak to them."

A visitor to the North Carolina Sweetpotato Commission's website will find that the NCSPC reflects this sentiment and the importance food culture plays in marketing and promoting sweetpotatoes. Here is one effect of globalization. On the NCSPC website, recipes are listed for several countries in order to gain buy-in with consumers. Without global consumers, there probably would not be a collection of sweetpotato recipes for different cultures portrayed on the website.

To reach consumers in foreign markets, the NCSPC promotes the use of sampling in grocery stores. This is because "if you have a food product it can market itself. They need to taste it" (Johnson-Langdon, 2011). In addition, the North Carolina Sweetpotato Commission partners with supermarkets who use chef demonstrations to prepare dishes that include the sweetpotato as an ingredient. This allows consumers in foreign markets to see the sweetpotato not just as an unknown vegetable sitting in a bin, but a vegetable that was used in familiar recipes for that particular country. In the brochure to sweetpotato supporters, there is a section titled, "Marketing Worth Mentioning" (Figure 18) which discusses the importance of sampling in expanding the sweetpotato into foreign markets. Again, globalization has affected how sweetpotatoes are marketed. Domestic food sampling demos involving sweetpotatoes are few and far between. They also tend to focus on new processed sweetpotato products. International demos involving sweetpotatoes focus on the use of fresh sweetpotatoes, as most sweetpotatoes sold internationally are fresh, not processed.

One role of the NCSPC is as informant to sweetpotato growers as the market changes. One change that is important for the NCSPC to disseminate to the growers is the different

Marketing Worth **Mentioning**

Scandanavia Is Sweet on NC Sweet Potatoes

More promising prospects in Denmark and Sweden

Sweden's largest grocery chain, ICA, conducted NC sweet potato sampling promotions in 71 stores.

Nathan Holleman, NCDA&CCS International Trade Specialist, recently completed a trip to Denmark and Sweden to observe and document in-store promotions at ICA, Sweden's largest retailer; meet with importers who are keen on adding NC sweet potatoes to their product list; and conduct store visits at other retail chains.

The sampling promotion seemed to be well received, as Holleman observed shoppers adding NC sweet potatoes to their shopping carts after tasting them.

COOP, Sweden's second largest chain, with outlets also in Denmark, has expressed interest in an in-store demonstration program. Both companies are happy with the product and find NC sweet potatoes superior to those from Israel and Egypt. The potential for increased sales is promising provided there is promotional support and consumer education to enhance sampling and demonstrations.

"I am hopeful that the Commission and NCDA continue to build awareness in Western Europe through in-store samplings, publicity, chef contests, and other activities designed to create interest in and stimulate use of North Carolina sweet potatoes," said Holleman.

Figure 18. "Marketing Worth Mentioning" Source: NCSPC, brochure. (NCSPC, 2010f).

regulations and standards that are imposed in a foreign market. These changes continually shape relationships between the different actors in North Carolina's sweetpotato commodity chain, within the United States' borders and outside of them. Due to NCSPC's prominent role in promoting sweetpotatoes in foreign markets, the organization is key actor in shaping the global aspect of the SPCC.

5.2.2 Views on the NCSPC from the participants. Participants were hesitant to speak of any disadvantages that may come from being a part of the North Carolina Sweetpotato Commission. However, growers did note two criticisms of the NCSPC that had been voiced either to them by other members of the NCSPC or by the participants themselves. The first criticism is the perception that the NCSPC is more focused on expanding internationally for the benefit of a half dozen or so growers and packer-shippers. For example, one participant noted that growers who do not sell sweetpotatoes overseas may take issue with the NCSPC focused so much on promoting and marketing sweetpotatoes overseas to the benefit, in these growers' minds, of only a few who send sweetpotatoes overseas. However, this participant, who does not sell overseas, argued,

> "that's not what they're doing. You're taking potatoes out of that supply for domestic. You're putting value [into the sweetpotatoes and] that's probably the hardest thing to get people to understand…we all sell out of the same pile. Wherever you do your promotion it's about moving sweetpotatoes and that helps us all. Whenever they make that comment, they're being a little selfish and not thinking through what is actually going on…all ships rise in a high tide" (F04, 2011).

This sentiment towards the NCSPC's involvement in promoting sweetpotatoes overseas suggests that the NCSPC may need to educate the growers of the NCSPC's position on the importance of marketing to European markets for North Carolina's sweetpotato industry, especially as acreage of sweetpotatoes increases rapidly (from 55,000 acres in 2010 to an

estimated 65,000 acres in 2011). The importance of this is demonstrated in Sonnenfeld et al's study of Washington apples, in which the authors draw the conclusion that "what has changed in the last decade [the 1980s] is the wide-spread acceptance by apple industry participants of the necessity of global markets for marketing a rapidly expanding volume of fruit" (1998: 174). The opinion that growers who do not sell overseas may not see the necessity of global markets and the use of the assessments by the NCSPC to promote exporting sweetpotatoes may be an impediment to the continual expansion of North Carolina's sweetpotato industry into foreign markets if it is not addressed by the NCSPC.

The second criticism some growers had with the NCSPC is the required payment of an assessment fee that was mentioned earlier. One participant stated that he and two other growers had decided in 2010 not to pay the assessment fee, because "we didn't really see where it's done us a lot of good and we don't [want to] be members of it. We got two or three letters about it and then the next thing we know we got a letter from the lawyer we had to pay it. If you grow sweetpotatoes you are forced, it's required, you're forced to be in the sweetpotato association" (F07, 2011).

Surprisingly, F07 (2011) stated that many of the smaller sweetpotato growers, especially outside of eastern North Carolina, were unaware of the fee required by law. As F01 (2011) states, "Anybody who pays assessment is a member of the sweetpotato commission, whether they want to be or not." Other growers voice their concerns about the North Carolina Sweetpotato Commission to the packer-shipper that purchases sweetpotatoes from them: "You've got growers out there, [asking] 'why am I spending that kind of money, how do I benefit,'" (PC02, 2011). There is clearly a disconnect occurring where some sweetpotato growers do not understand why they are assessed and where that money goes and how it may

benefit them, even if it is not in the form of the NCSPC directly selling their sweetpotatoes for them.

While there are criticisms of the North Carolina Sweetpotato Commission, the advantages of the NCSPC spoken of by the participants and the information gathered on the NCSPC, demonstrated the role of the organization in the SPCC. Before continuing, it is important to note that six of the eight growers interviewed have been or are on the NCSPC Board of Directors and two of the four individuals interviewed from produce companies have been or are on the Board of Directors. There are three phrases that almost every participant associated with the NCSPC: promotion, education, and publicity of the sweetpotato (F01, 2011; F02, 2011; F03, 2011; F04, 2011; F05, 2011; F07, 2011; F08, 2011; PC02, 2011; PC03, 2011). One participant considered marketing the most important aspect of the NCSPC, including publicity from not just the media, but trade shows and demonstrating the uses of sweetpotato to chefs (PC03, 2011). The ITO also perceived the NCSPC as very important, because it lobbies nationally and at the state level for sweetpotatoes, which create awareness for sweetpotato markets (McIver, 2011).

F01 (2011), F02 (2011), and F03 (2011) echoed one another: the NCSPC has provided promotion and education in relation to the sweetpotato. F02 (2011) and F03 (2011) both considered the NCSPC one of the best resources used in the sweetpotato industry, because it promotes the sweetpotato extensively on a small budget that otherwise individual growers would not have been able to do. F03 (2011) regarded the NCSPC as "the best thing that's ever been done for our industry." These participants are very involved in the NCSPC, especially on the Board of Directors, which gives them more insight than others into how and to what extent the NCSPC helps the sweetpotato industry. This is mentioned by F05 (2011) who regarded his time

on the Board as very informative, because he now understood how the money from the assessment was spent and how that in turn helped the sweetpotato industry as a whole and him, indirectly or directly, as a grower.

5.3 Other State Agencies Connected to the SPCC

In addition to the North Carolina State University and the North Carolina Sweetpotato Commission, there are several other agencies involved in the sweetpotato commodity chain that help extend the chain into the global market. These include: NCDA International Trade Office (ITO), Southern United States Trade Association (SUSTA), and the United States Department of Agriculture's Foreign Agricultural Service (FAS). These agencies act in tandem to promote exports of commodities, involving the national level (FAS), southern region of the United States (SUSTA), and the state level (ITO). Though these organizations are discussed separately, many aspects of their operations or efforts are combined with each other in order to help the exporters as much as possible.

5.3.1 USDA Foreign Agricultural Service. The Foreign Agricultural Services provides tools and assistance to new and experienced United States' exporters. Examples of tools they provide include: guidelines on trade regulations; trade association representatives; foreign buyers list; export directory of U.S. food distribution companies; U.S. suppliers list; and trade leads on inquiries from foreign buyers seeking US products (FAS, 2010).

Perhaps the best tool that the USDA provides not just sweetpotato exporters, but exporters of all commodities, are the Foreign Agricultural Offices (FAO) located within each country or region of smaller countries. McIver (2011) describes the FAOs as "exceptional at what they do." There are several benefits to connecting with an FAO in a target market. The FAO will: set up buyer introductions; set up importer and/or distributor introductions; and

provide retail tours so the exporter will learn about the market and how retailers sell goods (McIver, 2011). The exporter, by exploring the potential target market or revisiting a country that the exporter already sells to in order to update market strategy, can know how to display and market their product in order to get into or stay in a particular market.

5.3.2 Southern United States Trade Association. SUSTA, a non-profit organization that began in 1973, is comprised of Departments of Agriculture from 15 states in the southern region of the United States and from the Commonwealth of Puerto Rico and receives funding from the FAS and private companies (SUSTA, 2011). Its purpose is to increase exports from the southern states of the United States (SUSTA, 2010a) and its "mission is to develop export markets for the agricultural and food products of its region and thus enhance the region's economic well-being" (SUSTA, 2010b: 5). It promotes exports through various programs such as trade shows, missions, and seminars; special event and in-store promotions; education for exporters and importers; industry market research; and the MAP Branded Reimbursement program. These programs help exporters, including sweetpotato exporters, prepare for and export to foreign countries through education, promotion, and financing, as well as giving growers and packer-shippers the confidence that no matter the size of their operation, if they want to export there are programs available to assist them.

5.3.3 The NCDA International Trade Office. The NCDA International Trade Office seeks to educate farmers on the export markets available to them to sell their goods (McIver, 2011). Specifically, the ITO teaches potential exporters "how to export, what certain things mean, be it letters of credit and how to get those letters of credit; insurance to insure their shipments, because a lot of people are scared to get into the export market. Because of the fear of the unknown, they don't know the people they are selling to" (McIver, 2011). The ITO works

with several agencies and organizations in not just sweetpotatoes, but all commodities exported from North Carolina to help potential and current exporters learn more about the export market. These organizations include: North Carolina Department of Commerce; Small Business Association; Small Business and Technology Development Center; and US Commercial Service (NC Exporting Passport Brochure).

In addition to educating farmers and other potential and current exporters on the export market, the ITO also works with culinary schools in order to develop recipes tailored to the market that packer-shippers are targeting that includes the sweetpotato as an ingredient (McIver, 2011). The ITO also gathers as much information as possible about potential markets so growers and packer-shippers know their potential in the targeted market and how to effectively sweetpotatoes promote and market them to those particular countries.

While some countries in Europe view the sweetpotato as an exotic vegetable or a "winter food that is a hearty and sustainable meal," the ITO is actively working to help educate consumer in these countries about the potential of sweetpotatoes as a year-round food. The ITO promotes the sweetpotato in a manner so that it is "known as a United States' commodity, but we market it so it will fit well into their culture and their style of eating" (McIver, 2011). This includes promoting the sweetpotato as a summer vegetable that can be grilled under the concept of pushing the American tradition of barbequing and sweetpotato as "soul food from the United States that can be eaten year-round" (McIver, 2011).

By associating sweetpotatoes with the United States, and particularly with North Carolina, this gives an advantage to the United States as more countries try to export their own sweetpotatoes. A key tool that the ITO and other agencies involved in promoting and marketing sweetpotatoes abroad, or helping those who do, is education. McIver (2011) said that education

is important, because "[sweet]potatoes from our competitors are green, so they're going to have quite a big difference in taste [and the] shelf life is quite different for our versus theirs. The storage is quite different. Those are things that we'll hopefully develop programs for educating these importers and distributors on how to know the difference and appreciate the difference." Much like sweetpotato sellers in North Carolina had to convince domestic buyers that cured sweetpotatoes are the best sweetpotatoes, so do sweetpotato exporters have to convince importers and distributors that cured sweetpotatoes are better than green sweetpotatoes.

Exporting sweetpotatoes is very important to North Carolina's agricultural sector, because it is a growing sector and will continue to grow as sweetpotatoes are promoted (McIver, 2011). The ITO has helped create awareness for sweetpotatoes for at least ten years (McIver, 2011). It helps everyone that comes to its door and seeks out those who may not know about its services (McIver, 2011). While the ITO has numerous programs to help growers and packer-shippers become involved in or increase their involvement in export markets, there are many who do not know about these services or the extent of them. McIver (2011) said there are "so many options for sweetpotato farmers to get involved."

ITO wants to be the first stop, because they are in the same state as the growers and can "hole their hand" through every step (McIver, 2011). While ITO is a significant actor in the sweetpotato commodity chain and it does create awareness of North Carolina's sweetpotatoes in the export market, ultimately it is up to the exporters. McIver (2011) "makes connections for them, [but] they get so good at what they do that they don't need us. They're better. It's the farmers from North Carolina that make the difference." Without the tenacity and determination of the sweetpotato growers and packer-shippers, a North Carolina sweetpotato may not be sitting in a Tesco across the Atlantic in London. Now that I have examined the data and constructed

North Carolina's sweetpotato commodity chains, I present my conclusions of this study in the final chapter.

CHAPTER SIX: CONCLUSIONS

In conclusion, my research has shown through the use of a commodity chain analysis how globalization has expanded and lengthened the sweetpotato commodity chain to include foreign markets. As late as the 1980s, the sweetpotato commodity chain of North Carolina ended with domestic markets and consumers. By 2010, the sweetpotato commodity chain now ends with foreign markets and consumers. Looking back at Figure 8, which shows both the historical and present-day sweetpotato commodity chains, the SPCC expands and lengthens geographically, stretching over thousands of miles to other countries, as sweetpotato actors begin marketing sweetpotatoes overseas.

An interesting finding of this study is the importance of the year 2005 to North Carolina's sweetpotato industry. There was a confluence of events that occurred in 2005 that has helped propel the North Carolina sweetpotato industry even further into foreign markets. First, in 2005 the USDA formalized the tobacco buyout program, which many sweetpotato growers in North Carolina benefited from and used to improve facilities used for their sweetpotatoes. Second, the Covington sweetpotato variety was released. Third, the NCSPC began its efforts to market and promote North Carolina sweetpotatoes in foreign markets. The result of these three events was North Carolina becoming the leading sweetpotato exporter in the United States, giving North Carolina sweetpotato operations the confidence to begin or continue exporting sweetpotatoes. All of these events, almost a stroke of luck, occurring at once have allowed North Carolina to increase its presence in the global sweetpotato economy.

North Carolina sweetpotato exports, as a percentage of United States' sweetpotato exports, has risen 7000%, as mentioned earlier. Actors in North Carolina's sweetpotato industry seem to see globalization as increasingly important in growing their industry and are increasing

their role within the global sweetpotato economy. In comparison to the second leading sweetpotato exporter in the United States, California, North Carolina sweetpotato exporters have focused more on the export market. There is an almost US $30 million gap in sweetpotato export value in 2010 between the two states. Globalization has more of an impact on North Carolina's sweetpotato industry than other states, as North Carolina focuses efforts on expanding into foreign markets. This is due to efforts by actors within the SPCC as they sought to use the advantages globalization brought to North Carolina's sweetpotato industry.

These efforts are seen along multiple segments of the SPCC and are a direct, sometimes indirect, result of globalization. These include: the plant breeders who developed a variety with a long shelf-life, the NCSPC which is active in promoting and marketing sweetpotatoes in export markets alongside ITO and SUSTA, the packer-shippers who put up their own money to develop markets for the sweetpotato, the buyers who took a chance on a vegetable that was foreign to consumers, and the processors who made the leap from sweetpotato fries created in white potato processing plants to a processing plant solely for sweetpotato products. The North Carolina sweetpotato industry has become an industry to watch as globalization continues to occur before our very eyes.

There are particular segments of the SPCC where globalization has clearly had an effect. These include: the labor segment where many workers in North Carolina's sweetpotato industry are immigrants; the marketing and promoting segments of the SPCC where sweetpotato exporters, brokers, and organizations/government agencies like the North Carolina Sweetpotato Commission, International Trade Office, Foreign Agricultural Offices, Foreign Agricultural Service, and Southern United States Trade Association promote and market sweetpotatoes to several foreign buyers; and the distribution segment where sweetpotato growers and exporters

sell their sweetpotatoes to buyers who either are within a foreign market or buyers that will sell to buyers within foreign markets.

Perhaps one of the more visible effects of globalization on the SPCC is the role of food standards in the sweetpotato industry that are determined either by foreign certifying organizations or by foreign buyers, particularly retailers. These global food standards are determined by entities an ocean away, but are critical to North Carolina's sweetpotato industry. Sweetpotato exporters must meet these requirements or they cannot participate in the global market. There are sweetpotato operations in North Carolina that choose not to adhere to foreign food standards, choosing instead to follow domestic food standards and focus on the domestic market. Globalization has expanded and complicated North Carolina's SPCC by introducing new actors like organizations that monitor agricultural practices.

While some researchers of globalization exclude neighboring or regional countries when examining the globalization of an industry, I do not. As was shown, the relationship between North Carolina sweetpotato exporters and Canada, though the United States' neighbor to the north, has changed significantly over the past decade, with 2010 sweetpotato exports significantly higher than the previous years, as was demonstrated in Table 8. This illustrates that even though a foreign market may be within a stone's throw of the United States' border, that market may not have been "tapped" byexporters of United States' goods, like the sweetpotato. Globalization is having an effect on North Carolina's sweetpotato industry in this case by opening up a market further to sweetpotato exporters.

Globalization has also influenced the technology used by actors in the sweetpotato industry. The vice versa also holds true, because changing technology in North Carolina's sweetpotato industry has facilitated the transformation of the industry from a domestic industry

to a global business for many in the North Carolina sweetpotato industry. The electronic sizer discussed in Chapter Four is a prime example of how technology is affected by globalization and in turn affects the industry that uses it. The electronic sizer has allowed sweetpotato exporters to meet the demands of foreign consumers, who often have different preferences concerning their produce than domestic consumers. The electronic sizer is also a great marketing tool for sweetpotato exporters to convince foreign buyers that their requirements can be met. Globalization has also affected how these sizers are modified, as important foreign buyers are consulted by some sweetpotato exporters prior to making any modifications to ensure their needs are met.

Other technological changes that have facilitated North Carolina's sweetpotato industry's entry into foreign markets are the technologies that allow sweetpotatoes to be cured and stored year-round. These changes allowed sweetpotato exporters to reassure foreign buyers that not only will they receive sweetpotato that are eatable after the long transit across the Atlantic to their ports, but also a consistent supply of sweetpotatoes throughout the year.

Another effect of globalization is the impact that consumer preferences have on whether or not a variety dominates the market. The Covington variety of sweetpotato has benefited greatly from this, because it is shaped similar to the white potato which is familiar to foreign consumer. As was discussed in Chapter Four, this similarity is great for the international market, because consumers are more comfortable purchasing a sweetpotato that is similar to a white potato over one that is not. Since the Covington is specifically developed for North Carolina, this gives North Carolina a significant advantage in foreign markets.

Globalization has both hurt and helped North Carolina sweetpotato exporters in terms of dealing with competitors. It has hurt North Carolina sweetpotato exporters, because when these

exporters first began selling sweetpotatoes overseas in earnest, they used their own money to develop markets in Europe for sweetpotatoes. Once these markets were established, competitors from other countries were able to gain market share, making sweetpotato exports unappealing financially to some sweetpotato operations in North Carolina as these competitors undercut their prices.

However, North Carolina sweetpotato exporters are beginning to use this to their advantage to showcase the differences between their (cured) sweetpotatoes and competitors'' (green) sweetpotatoes. As discussed in Chapter Four, once consumers taste the differences, North Carolina sweetpotatoes exporters are confident that buyers will purchase North Carolina sweetpotatoes, even if the price is higher than competitors', because of the difference in taste and quality. In addition, North Carolina invested heavily in controlled-atmosphere storage, guaranteeing buyers a year-round supply, whereas competitors have little, if any, year-round storage capacity. Globalization allows foreign buyers to compare different sweetpotato exporters and so far North Carolina seems to hold a significant market share in foreign countries.

One of the most significant findings of this study concerning the effects of globalization on the sweetpotato industry, which also applies to the wider agri-food sector, is the role of the state in the SPCC. As global market forces—like food standards—dictate practices in agriculture, state agencies must find where they fit into a commodity chain. I argue, and the findings of this thesis support, that state agencies and organizations' roles in North Carolina's sweetpotato industry demonstrate that their presence has not diminished and are in fact vital to the sweetpotato industry's success in the global sweetpotato economy.

This was demonstrated through the examination of multiple state agencies involved in the SPCC in Chapter Three. As was demonstrated, the NCSPC, which derives its power and funds

from a state law mandating the collection of assessment fees on sweetpotato acreage, is a significant actor in the SPCC. The NCSPC has, so far, successfully positioned North Carolina as the place that foreign buyers should turn to when purchasing sweetpotatoes through its various activities and web presence. The NCSPC has aided sweetpotato exporters surmount problems associated with globalization, such as marketing a foreign vegetable so that it appeals to consumers in multiple countries. However, the NCSPC will serve itself well if it heeded the observations discussed in Chapter Five and educated its members on how the assessment fees are used and why it is important for the entire North Carolina sweetpotato industry that the NCSPC promote sweetpotatoes in foreign markets.

The largest role that state agencies like the ITO, SUSTA, FAO, and the NCSPC play in the sweetpotato commodity chain is connecting and educating exporters and importers of sweetpotatoes, which was discussed in Chapter Five. The take-away from the educational efforts of these agencies and organizations is the availability of funds and influence these state agencies and organizations provide that a single sweetpotato exporter does not have access to. Here, the state can assist sweetpotato exporters by providing specialized consultants when needed. The state can also assist by funding marketing and promotional events that all North Carolina sweetpotato exporters can take advantage of to create more exposure for their products. In addition, the state agencies provide several other resources to sweetpotato exporters—many of which are available to growers of a variety of produce—as discussed in Chapter Five. While the state may not be as prominent as it used to be in regulations and food standards, the state is still very much present in the agri-food sector, just in a slightly different capacity.

An important effect of globalization that has yet to be mentioned is granting consumers a new choice in a variety of areas where people consume food. Consumers like choice. The

choice of a fresh sweetpotato, sweetpotato fries, mashed sweetpotatoes, boiled sweetpotatoes, candied yams, sweetpotato pies, or even sweetpotato pancakes or bread or cookies! Consumers are people and people like choices. The globalization of sweetpotatoes gives consumers in many different countries the choice to try and buy North Carolina sweetpotatoes that many did not have even ten years ago. Consumers, though not examined in detail in this study, are vital to the continual expansion and lengthening of the sweetpotato commodity chain and in determining how globalization affects North Carolina's sweetpotato industry.

Ultimately, though, the key actors in the globalization of the sweetpotato commodity chain are the growers and packer-shippers. Buyers can call the farmer all they want, as they did with F07, but like F07, the grower or packer-shipper can turn the buyer down. Yes, today's market is significantly buyer-driven, with growers and packers choosing crops and packaging certain sizes at the behest of the grower. However, the growers and packer-shippers are taking a risk when they load good, quality sweetpotatoes on to a boat that has to sail across an ocean and travel to distributors and importers, taking about two weeks to finally reach the consumer.

The grower-packer-shipper is the true driving force behind the expansion of North Carolina's sweetpotato industry. They are the ones who pushed processors to see that the consumer wanted sweetpotato products and they are the ones who put up the capital and manpower initially to introduce North Carolina's sweetpotatoes to the rest of the world. The grower-packer-shippers are probably also the ones to push value-added products into the export market, eliminating the problem of shelf-life for at least the processed goods.

If there is one thing that the globalizing nature of North Carolina's sweetpotato industry can teach other industries, it is this: be prepared, particularly in technological advancements that can "sell" the commodity to foreign markets. Even if a commodity has yet to penetrate the

global market, if an operation—or a state or country—is able to step into the role of fulfilling consumers' demands as soon as they occur this places that operation, or state or country, ahead in the market. If consumers in foreign markets want more sweetpotatoes, North Carolina's sweetpotato industry is prepared to meet their demands. Actors involved in North Carolina's sweetpotato industry are probably better prepared to meet those demands than any other sweetpotato producing area in the world due to the investments that they are making now.

These investments include the technological changes discussed earlier, the investments in North Carolina State University's programs related to the sweetpotato industry, and the investments made by government agencies and the growers' organization in promoting and marketing sweetpotatoes in foreign markets. North Carolina's sweetpotato industry is on the cusp of becoming a truly globalized part of the global sweetpotato economy. The North Carolina's sweetpotato industry is preparing now for the anticipated demand as the sweetpotato becomes more popular in international markets. North Carolina's sweetpotato industry is not waiting around to see if the world will catch on to sweetpotatoes; it is preparing for it (because those in the industry see it as inevitable) and it is proactive in shaping the image of sweetpotatoes throughout the world (i.e. portraying sweetpotatoes as orange, sweet, moist-fleshed, which are grown best in North Carolina).

What does the globalization ultimately mean for the farmers, companies, and consumers of sweetpotatoes, or any other agri-food commodity? I cannot answer that in a sweeping generalization. Some sweetpotato farmers choose to increase their production and shipment of sweetpotatoes to international markets. Others see the sweetpotatoes sold, regardless of destination to a domestic or an international market, as one big pile and the more that pile goes to a market other than the ones that particular farmer is targeting, the more buyers in the targeted

market that farmer has available to him or her. Certainly, there are profits to be made if the company or farmer takes the risk of entering a new market and the international market is fraught with many risks from the moment the sweetpotato slip is planted, just like the domestic market for sweetpotatoes is fraught with its own risks. Globalization has given farmers, companies, and everyone involved in selling sweetpotatoes—or any other commodity—access to foreign markets. Whether or not these actors choose to take the risks that come along with access to those markets is ultimately up to them.

I began this study with four questions: how does the North Carolina sweetpotato industry fit in the global sweetpotato economy; how has the North Carolina sweetpotato industry evolved since 1970; what are the current market trends that influence the North Carolina sweetpotato industry; and, what does the case of the North Carolina sweetpotato industry tell us about globalization and its effects. The findings presented here answer these questions, but open the door to more areas of research.

As I mentioned earlier, North Carolina's sweetpotato industry is on the cusp of great change due to the changing nature of the globalizing food sector. Potential areas for research include: examining the processing-side of the sweetpotato industry, both processing plants for corporations and processing plants individual packer-shippers may own; examining the export markets, such as the differences between promoting and marketing sweetpotatoes between, for example, Canada and France; and examining the United States sweetpotato industry as a whole. Regardless of how globalization affects the sweetpotato industry, the sweetpotato industry won't let you forget about them, because, as F01 (2011) said, "Sweetpotato farmers are about the most—well, they're the next thing to a tobacco farmer. And they're the most vocal" and if they

have anything to say about it, North Carolina sweetpotato farmers will be seen on plates around the world.

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APPENDIX A

EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board Office
1L-09 Brody Medical Sciences Building• 600 Moye Boulevard • Greenville, NC 27834
Office **252-744-2914** • Fax **252-744-2284** • **www.ecu.edu/irb**

TO: Hilda Bryan, Student, Dept. of Geography, ECU

FROM: UMCIRB

DATE: May 31, 2011

RE: Expedited Category Research Study

TITLE: "Sweet Potatoes in a Globalizing World: A Study of the Effects of Globalization on North Carolina's Sweet Potato Market and its Geography"

UMCIRB #11-0264

This research study has undergone review and approval using expedited review on 5.25.11. This research study is eligible for review under an expedited category number 6 & 7 which include collection of data from voice, video, digital, or image recordings made for research purposes and research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies. (NOTE: Some research in this category may be exempt from the HHS regulations for the protection of human subjects. 45 CFR 46.101(b)(2) and (b)(3). This listing refers only to research that is not exempt.). The Chairperson (or designee) deemed this **unfunded** study **no more than minimal risk** requiring a continuing review in **12 months**. Changes to this approved research may not be initiated without UMCIRB review except when necessary to eliminate an apparent immediate hazard to the participant. All unanticipated problems involving risks to participants and others must be promptly reported to the UMCIRB. The investigator must submit a continuing review/closure application to the UMCIRB prior to the date of study expiration. The investigator must adhere to all reporting requirements for this study.

The above referenced research study has been given approval for the period of **5.25.11** to **5.24.12**. The approval includes the following items:

- Internal Processing Form (dated 3.22.11)
- Informed Consent (dated 5.23.11)
- COI Disclosure Form (dated 3.22.11)
- General Questionnaire

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

The UMCIRB applies 45 CFR 46, Subparts A-D, to all research reviewed by the UMCIRB regardless of the funding source. 21 CFR 50 and 21 CFR 56 are applied to all research studies under the Food and Drug Administration regulation. The UMCIRB follows applicable International Conference on Harmonisation Good Clinical Practice guidelines.

APPENDIX B

General Statutes relating to sweetpotato farming, from North Carolina Department of Agriculture and Consumer Services, http://www.ncagr.gov/aglaw/index.html

§ 106-550. Policy as to promotion of use of, and markets for, farm products.

It is declared to be in the interest of the public welfare that the North Carolina farmers who are producers of livestock, poultry, field crops and other agricultural products, including cattle, sheep, broilers, turkeys, commercial eggs, peanuts, cotton, potatoes, sweet potatoes, peaches, apples, berries, vegetables and other fruits of all kinds, as well as bulbs and flowers and other agricultural products having a domestic or foreign market, shall be permitted and encouraged to act jointly and in cooperation with growers, handlers, dealers and processors of such products in promoting and stimulating, by advertising and other methods, the increased production, use and sale, domestic and foreign, of any and all of such agricultural commodities. The provisions of this Article, however, shall not include the agricultural products of tobacco, strawberries, strawberry plants, porcine animals, or equines, with respect to which separate provisions have been made. (1947, c. 1018, s. 1; 1951, c. 1172, s. 1; 1957, cc. 260, 1352; 1989 (Reg. Sess., 1990), c. 1027, s. 1.1; 1991, c. 605, s. 2; 1995, c. 521, s. 1; 1998-154, s. 2.)

§ 106-553. Policy as to referenda, assessments, etc., for promoting use and sale of farm products.

It is hereby further declared to be in the public interest and highly advantageous to the agricultural economy of the State that farmers, producers and growers commercially producing the commodities herein referred to shall be permitted by referendum to be held among the respective groups and subject to the provisions of this Article, to levy upon themselves an assessment on such respective commodities or upon the acreage used in the production of the same and provide for the collection of the same, for the purpose of financing or contributing towards the financing of a program of advertising and other methods designed to increase the consumption of and the domestic as well as foreign markets for such agricultural products. Such assessments may also be used for the purpose of financing or contributing toward the financing of a program of production, use and sale of any and all such agricultural commodities. (1947, c. 1018, s. 4; 1951, c. 1172, s. 2.)

§ 106-554. Application to Board of Agriculture for authorization of referendum.

Any existing commission, council, board or other agency fairly representative of the growers and producers of any agricultural commodity herein referred to, and any such commission, council, board or other agency hereafter created for and fairly representative of the growers or producers of any such agricultural commodity herein referred to, may at any time after the passage and ratification of this Article make application to the Board of Agriculture of the State of North Carolina for certification and approval for the purpose of conducting a referendum among the growers or producers of such particular agricultural commodity, for commercial purposes, upon

the question of levying an assessment under the provisions of this Article, collecting and utilizing the same for the purposes stated in such referendum. (1947, c. 1018, s. 5.)

§ 106-557. Notice of referendum; statement of amount, basis and purpose of assessment; maximum assessment.

With respect to any referendum conducted under the provisions of this Article, the duly certified commission, council, board or other agency shall, before calling and announcing such referendum, fix, determine and publicly announce at least 30 days before the date determined upon for such referendum, the date, hours and polling places for voting in such referendum, the amount and basis of the assessment proposed to be collected, the means by which such assessment shall be collected if authorized by the growers, and the general purposes to which said amount so collected shall be applied; no annual assessment levied under the provisions of this Article shall exceed one half of one percent (½ of 1%) of the value of the year's production of such agricultural commodity grown by any farmer, producer or grower included in the group to which such referendum is submitted. Provided, that the assessment for the research and promotion programs of the American Dairy Association of North Carolina may be fixed on the volume of milk sold not to exceed one percent (1%) of the statewide blend price paid to all North Carolina producers during the previous calendar year for three and one-half percent (3.5%) milk as computed by the United States Department of Agriculture. Provided further, that the assessment authorized by this Article and collected by the Commissioner of Agriculture to be paid to the North Carolina Yam Commission, Inc., or other duly certified agencies entitled thereto for research, marketing and promotional programs related to yams or sweet potatoes may be levied at a rate not to exceed two percent (2%) of the value of the year's production of that agricultural commodity grown by any farmer, producer or grower included in the group to which the referendum is submitted, and when authorized by two-thirds or more of the farmers, producers or growers in the area in which the referendum is conducted, the rate of the assessment may remain in effect for the length of time provided in the referendum. Provided further, that the assessment authorized by this Article on peanuts may not exceed two percent (2%) of the price paid to the producer. (1947, c. 1018, s. 8; 1967, c. 774, s. 1; c. 1268; 1981, c. 216, s. 1; 1983, c. 246, s. 1; 1997-371, s. 1; 2004-199, s. 27(e); 2006-264, s. 24.)

§ 106-561. Effect of two-thirds vote for assessment.

If in such referendum called under the provisions of this Article two thirds or more of the farmers or producers in the area in which such referendum is conducted, eligible to participate and voting therein shall vote in the affirmative and in favor of the levying and collection of such assessment proposed in such referendum on the agricultural commodity covered thereby, then such assessment shall be collected in the manner determined and announced by the agency conducting such referendum. (1947, c. 1018, s. 12.)

§ 106-564. Collection of assessments; custody and use of funds.

In the event two thirds or more of the farmers eligible for participation in such referendum and voting therein shall vote in favor of such assessment, then the said assessment shall be collected annually or at regular intervals during the year established by the rules and regulations of the

duly certified commission, council, board or other agency for the number of years set forth in the call for such referendum, and the collection of such assessment shall be under such method, rules and regulations as may be determined by the agency conducting the same; and the said assessment so collected shall be paid into the treasury of the agency conducting such referendum, to be used together with other funds from other sources, including donations from individuals, concerns or corporations, and grants from State or governmental agencies, for the purpose of promoting and stimulating, by advertising and other methods, the increased use and sale, domestic and foreign, of the agricultural commodity covered by such referendum. Such assessments may also be used for the purpose of financing or contributing toward the financing of a program of production, use and sale of any and all such agricultural commodities. (1947, c. 1018, s. 15; 1951, c. 1172, s. 3; 1965, c. 1046, s. 1; 1975, c. 708, s. 1.)

§ 106-564.4. Alternative method for collection of assessments relating to sweet potatoes.

(a) In the event the producers of sweet potatoes approve an assessment pursuant to G.S. 106-564, which assessment shall be paid by the producer based on the number of acres produced, the producer shall report the number of acres planted and shall remit the assessment due to the Commissioner of Agriculture. Sweet potato producers shall report acreage planted at a time and place determined by the duly certified agency representing the producers of sweet potatoes.

(b) Assessments shall be due on September 1 of each year. Any producer who fails to pay assessments by September 30 of each year shall also pay a penalty of ten percent (10%) of the unpaid assessment, plus a penalty of one percent (1%) of the unpaid assessment for each month the assessment remains unpaid. The Commissioner of Agriculture shall remit all assessments received to the duly certified agency representing the producers of sweet potatoes. The duly certified agency representing the producers of sweet potatoes may conduct inspections and audits of sweet potato producers in order to verify the number of acres of sweet potatoes planted and may bring an action to recover unpaid assessments and penalties and the reasonable costs of such action, including attorneys' fees.

(c) There shall be no refund of assessments collected pursuant to this section.

(d) For the purposes of this section, "producer" shall be defined as a grower of one acre or more of sweet potatoes. (1995, c. 521, s. 2.)