Understanding Foodways and Plant Management Practices of Enslaved Communities in Nineteenth-Century West Tennessee

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Mary Katherine Brown

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ABSTRACT

In the nineteenth century, enslaved Africans and African Americans relied on multiple food sources, including foodstuffs that they grew and procured themselves. My research objectives aim to evaluate the foodways of enslaved African and African Americans in West Tennessee. Foodways include all aspects related to food, from food production and procurement to preparation, consumption, sharing, and discard. This study examines macrobotanical plant remains from Fanny Dickins EAAA House III (40FY303), which is an enslaved domestic site. Additionally, this analysis also investigates botanical remains from Cedar Grove (40FY325) and Widow Dickins (40FY462), which are an enslaved domestic site and a manor house site, respectively, to provide comparative context for 40FY303.

Incorporating two methods best suit this dataset and center this research on the production aspect of enslaved foodways. Using macrobotanical analysis, I identify the plants that enslaved Africans and African Americans interacted with and identify those that were provisioned by their enslavers, and those they procured or produced themselves. I also employ stable isotope analysis to determine if people enslaved at the Fanny Dickins and Cedar Grove plantations used plant management practices to increase the yield of crops that they cultivated. I compare the $\delta^{15}N$ [delta 15N] values of plant remains that were grown as cultigens by enslaved people at each site to the $\delta^{15}N$ [delta 15N] values of plant remains that would not have been fertilized to determine if the enslaved people practiced fertilization. I also compare the $\delta^{13}C$ [delta 13C] values of cultivated plants to comment on irrigation practices and climatic conditions. In addition

to agricultural practices, this research helps us understand more about the larger environmental conditions that people living in West Tennessee during the nineteenth century experienced. Ultimately this research considers how enslaved Africans and African Americans were able to use their limited time to cultivate and procure plants that fulfilled their otherwise unmet needs, and this work focuses on how enslaved people used fertilizers to mitigate the degradation of the land, which was caused by the harsh farming practices plantation owners implemented.

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CHAPTER ONE: INTRODUCTION

The rations that enslavers provided for the African and African American people whom they enslaved were often insufficient to meet their nutritional needs (Heath and Bennett 2000; Mrozowski et al 2008; Bowes and Trigg 2012; Hilliard 2014; Greer 2025). Archaeologists and historians have identified that enslaved people strategically supplemented the food provided to them with resources that they cultivated or procured themselves (Heath and Bennett 2000; Mrozowski et al 2008; Bowes 2011; Reifschneider and Bardolph 2020). While there are similarities in provisions and strategies to augment food supply across plantations and over two centuries, enslaved foodways differed depending on the size of the plantation, labor organization, and locally available resources (Covey 2005; Mrozowski et al. 2008; Greer 2025). Because foodways are so variable from region to region and even from plantation to plantation, it is incredibly important to evaluate them when archaeologically investigating plantations. This thesis applies the study of plantation foodways to understanding how enslaved Africans and African Americans practiced fertilization and crop cultivation to ensure that they had sufficient food to survive. This thesis contributes to an ongoing conversation about plantation foodways that examines the perspective of enslaved communities, rather than enslavers, and successfully shifts that focus for plantations in West Tennessee.

My research interests focus on identifying how enslaved people met their subsistence needs. I am particularly interested in understanding the types of food that enslaved populations had access to, and the steps they took in hopes of ensuring food security. Since enslaved people devoted time to growing plants themselves, it is possible that they implemented crop management strategies to maximize crop output. Here, I explore the fertilization strategies that enslaved peoples used at an early 19th-century cotton plantations in West Tennessee. I use macrobotanical remains to explore and uncover the plants they produced in kitchen gardens, procured wild from the local landscape, and received as provisions. I then employ stable isotope analysis to further identify practices related to food production processes, primarily fertilization. I find that enslaved Africans and African Americans used fertilization practices to cultivate plants, increasing their food security by supplementing their diets and contributing to their well-being.

West Tennessee, which is located between the Mississippi and Tennessee rivers, was one of the top five cotton-producing regions by the Civil War (Hilliard 1985, 2014). By 1850, Memphis was described as the "biggest inland cotton market in the world" (Moore 2017). Life in both urban settings, like the cotton markets, and rural plantation settings in West Tennessee was organized around cotton production and the oppression and exploitation of enslaved people whose labor made the cotton industry wildly profitable (Kasper et al. 2022). Since the plantation economy was so dominant in this region, archaeologists must continue to research West Tennessee to understand more about how people's lives were entangled with this abhorrent system.

Ames Plantation is a modern-day property in Fayette and Hardeman counties in West Tennessee. Fanny Dickins and Cedar Grove are two historical plantations, located on what is now the Ames property, that were investigated through extensive archaeological excavation and historical analysis by the Rhodes College Environmental

Archaeology Field School. Both Fanny Dickins and Cedar Grove were cotton plantations that overlapped in operation years. Cedar Grove was in operation from 1826 to emancipation, and over 240 African and African American people were enslaved there. In comparison, Fanny Dickins was operated from 1841 to 1853 by Fanny Dickins, who enslaved 40 African American people. Following Dickins's death in 1853, Dickins's brother, John Burton, operated the plantation until Caleb Jones purchased the plantation in 1855. These are two of many cotton plantations that existed in West Tennessee. **Figure 1.1** shows the location of these sites in relation to each other and to Ames Plantation.

There is a need to learn more about the lives of people who were enslaved on cotton plantations in the Deep South, as most of our knowledge of enslaved lifeways, particularly of enslaved plant-based foodways, comes from archaeological and historical research that has been conducted on tobacco plantations in the Chesapeake and sugar plantations in the Caribbean (Pulshiper 1990; Bowes 2011; Bowes and Trigg 2012). The work that archaeologists have been doing on the Ames property is some of the only archaeological research that has been conducted on plantation sites in West Tennessee (Maclin 2015; Kasper et al. 2024). It is important to ensure that we do not generalize the experiences of enslaved Africans and African Americans; furthering archaeological research is thus an important step in uncovering the truths about how people were able to survive under the horrors of slavery.

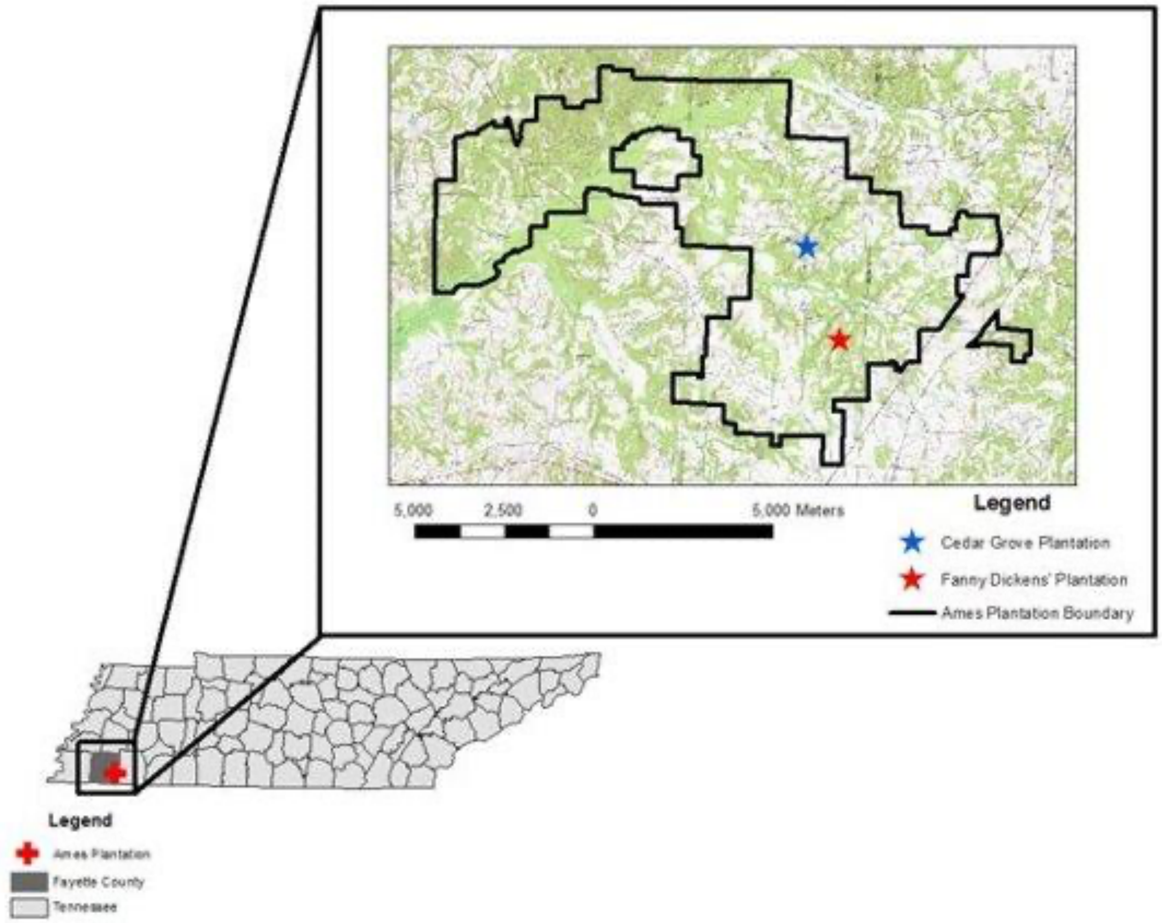

Figure 1.1 Ames Plantation and associated plantation sites (Kasper et al. 2022).

Research Questions

Excavations and sampling conducted to date at the Fanny Dickins and Cedar Grove plantations, as well as the Widow Dickins manor house, have produced materials conducive to my research interests in the foodways strategies of enslaved peoples in West Tennessee. My research questions include the following:

Research Question One: How were enslaved people in West Tennessee strategically meeting their subsistence needs by obtaining food from multiple sources? How did the demands of cotton production and the gang labor system affect their ability to engage in other food-related tasks?

To determine the many plants that enslaved people in West Tennessee interacted with, I conducted macrobotanical analysis of flotation samples recovered from Fanny Dickins EAAA House III (40FY303), an enslaved domestic site tied to the Fanny Dickins Plantation. Additionally, I analyzed samples from Cedar Grove (40FY325), an enslaved domestic site tied to the Cedar Grove Plantation, and Widow Dickins (40FY462), the manor house site associated with the Fanny Dickins Plantation, to compare and contextualize my findings at the Fanny Dickins Enslaved African and African American (EAAA) house III site with these other datasets. This question is also guided by Practice Theory. This theoretical framework highlights the daily practices enslaved people used to cultivate, transport, prepare, and consume plants in their domestic spaces. Through these daily practices, enslaved individuals cared for their families and survived under the oppression of slavery. Additionally, this question considers when enslaved people would have had time to engage in these practices outside of the labor they were undertaking on the plantation.

Research Question Two: Did enslaved people in West Tennessee employ fertilization practices to improve the crops that they were cultivating?

This question targets the plant management practices that enslaved people might have implemented regularly for crops that they cultivated for themselves. I address this question by conducting carbon and nitrogen stable isotope analysis of select cultigens and wild plant resources that I identified during macrobotanical analysis. The carbon and nitrogen values of the cultigens can indicate irrigation and fertilization practices, respectively. Incorporation of wild plant resources is necessary to establish a baseline for expected values in this particular landscape. Ultimately, identifying the use of plant-management practices, such as fertilization, is necessary to understand the relationships between enslaved people, crop cultivation, and animal husbandry, as these interactions occurred both in domestic spaces and on the larger plantation.

Thesis Outline

Chapter One, “Introduction,” presents the questions, theory, and datasets that guide this research. Chapter Two, “An Overview of People, Place, and Space at Ames Plantation,” introduces information about Ames Plantation, with focus on the people who lived on this landscape, the archaeological research conducted here, and the sites that this research investigates. Chapter Three, “Environmental Background,” provides context about the environmental conditions of West Tennessee in the past and present. In Chapter Four, “Plantation Foodways and Agricultural Practices,” I outline the theoretical approach I take, namely practice theory, and review the existing literature on plantation archaeology and foodways, and discuss crop seasonality and nineteenth-century fertilization practices. Chapter Five, “Methods,” explains the methodology used for this project. Chapters Six, “Results from Macrobotanical Analysis,” and Seven, “Results from Stable Isotope Analysis,” present the results of macrobotanical and stable isotope analyses, respectively. I present concluding thoughts in Chapter Eight, “Conclusions and Recommendations,” and provide the underlying data in the Attachments and Appendix.

CHAPTER TWO: AN OVERVIEW OF AMES PLANTATION

Ames Plantation is an 18,400-acre property, which includes 12,000 acres of forest and 2,000 acres that are used today for commodity crop cultivation (Ames Plantation 2025). Ames Plantation is situated between Fayette and Hardeman counties, and it is located 60 miles east of Memphis, Tennessee. In this chapter, I present important historical and contemporary context that helps us understand the many social and environmental interactions that occurred in the space now known as Ames Plantation. This chapter also presents an excavation history of Ames Plantation, demonstrating that significant archaeological research has been conducted to understand the lifeways of many groups who occupied this space. Additionally, I share the historical context of the Fanny Dickins and Cedar Grove plantations, and their associated archaeological sites, which are the primary sites of focus for this research.

People, Place, and Space at Ames Plantation

Ames Plantation has been a hub for human activity for over a thousand years, and likely much longer. This section provides a brief overview of the communities that interacted with this landscape, with emphasis on the groups that inhabited this space in the recent past.

White settlers were certainly not the first people to live on the Ames Plantation property, or in larger West Tennessee. Indigenous people have lived in West Tennessee for over 13,000 years, but recent archaeological research at Ames has focused on the Mississippian occupations (ca. AD 1000-1500) (Barnett 2012). Extensive archaeological work by Mickelson and colleagues identified mounds, town complexes, and other spaces which are connected to the Mississippian communities who lived at Ames Plantation and in the surrounding areas (Mickelson 2008; Goddard 2011; Mickelson and Goddard 2011; Guidry 2013). During the early colonial period, Spanish explorers, associated with expeditions led by Hernando DeSoto (1539-1542) and René-Robert Cavelier, Sieur de La Salle (1682), documented that the Chickasaws lived in this area of West Tennessee (Kasper et al. 2024). By the nineteenth century, the Chickasaws notably raised livestock, like cattle, and cultivated cotton, which were practices that they adopted from European settlers. However, the Chickasaws' implementation of these practices was likely informed by their own sources of traditional ecological knowledge (Barnett 2012). The Chickasaw people continued to have a large presence in West Tennessee until most of this population was forcibly removed to Oklahoma by the Indian Removal Act of 1830 (Barnett 2012).

By the 1780s, European colonists had moved from North Carolina, Kentucky, and Virginia and established small settlements in West Tennessee. Settlement in this area, however, was not formally organized or legal, until the Jackson Purchase of Chickasaw lands in 1818. Fayette and Hardeman counties were created in 1820. Two early settlers include Green L. Bennet and Joseph S. Williams, who both lived in Fayette County during the 1810s. During the nineteenth-century, cities such as Grand Junction, Hickory Valley, and LaGrange were organized and settled. People living and working at the plantations which make up the modern-day Ames property would have interacted with these communities frequently.

The rise of organized agriculture in the early nineteenth century brought several wealthy Euro-American plantation owners, such as John Jones, to this region of West Tennessee, where they organized plantations that they operated until the Civil War (Kasper et al. 2024). During the Civil War, fields were largely barren, as there was presence of both the Confederate and Union armies in nearby Grand Junction (Kasper et al. 2024). Following the Civil War, farming practices shifted from large plantations that produced commodity crops to small farms that produced subsistence crops (Kasper et al. 2024).

From 1901 to 1936, Hobart Ames of Massachusetts purchased 25,000 acres of land in Fayette and Hardeman counties. The Ames family used this property to quail hunt and escape the cold New England winters. Following Ames's death in 1945, his wife, Julia C. Ames, started organizing a trust to commemorate her late husband, and to benefit the University of Tennessee. The property, referred to as Ames Plantation (although not a plantation in the antebellum sense), has operated under this structure since Julia Ames's death in 1950. Ames Plantation continues to be privately owned and operated by the trustees of the Hobart Ames Foundation.

Since Ames Plantation was formally organized as a trust, it has become a center for agricultural production, a site of ecological and archaeological research, and serves as the host of the National Championship for Bird Dogs. Ames Plantation currently plants approximately 850 acres of soybeans, 700 acres of corn, 200 acres of wheat, 200 acres of cotton, and 70 acres of grains like sorghum and barley (Ames Plantation 2025). In addition to commodity row crop production, Ames also raises livestock, notably 300 head of Angus beef cattle and 40 head of horses (Ames Plantation 2025). Ames Plantation has hosted the National Bird Dog Championship yearly since 1915 (Ames Plantation 2025). Additionally, through the initiative of the Ames Cultural Resource Program, over 225 historic sites and many additional sites associated with Tennessee's deep history were identified and registered with the Tennessee Division of Archaeology (Ames Plantation 2025).

Excavation History

Since the early 2000s, archaeologists from Rhodes College and the University of Memphis have conducted archaeological research on the property to better understand the experiences of the many individuals who lived on this land (Mickelson and Goddard 2011; Maclin et al. 2015; Kasper et al. 2024). In 2007, a team of archaeologists from the University of Memphis (Dr. Andrew Mickelson) and Rhodes College (Dr. Milton Moreland and Dr. Richard Bryne) worked with Ames Plantation staff to establish a field school that would be accessible for Memphis-area undergraduate students interested in archaeology. From 2007 until 2010, Dr. Moreland focused on three separate nineteenth-century sites associated with the Holcombe plantation, a 900-acre plantation located on the Ames property (Maclin et al. 2015). Holcombe I (40FY446) is an enslaved domestic site; Holcombe II (40FY281) is the Woodstock Manor home, which was the Holcombe family residence; and Holcombe III (40FY298) is an outbuilding, likely a barn, associated with the manor house. Soil samples were collected and floated from all three sites, but they have yet to be analyzed.

After excavations at the Holcombe plantation sites concluded, the Rhodes College team began to investigate new sites. The first two are associated with the Fanny Dickins plantation (**Figure 2.1**). This plantation changed ownership three times, but it is most frequently associated with Fanny Dickins, a widow who owned this plantation from 1841 to 1853. In 1850, Dickins enslaved 40 African and African American people on this 446-acre plantation, 19 of whom were adults or teenagers, and 21 of whom were children (United States Census Office 1850; Kasper et al. 2024). Dickins purchased the 200-acre plantation, including these slave quarters, from Binbury Walton in September of 1841 (Fayette County, TN Deed Book 1841). Dickin's plantation focused on cotton production, like many other plantations in the area. In 1853, Dickins died at age 59. The plantation was then operated by her brother, John W. Burton, for two years until the chancery court settled her estate (Smith 1996). Burton then sold the plantation to Caleb Jones, the son of John Jones, who bought it with the intent of expanding his own plantation operation. Jones likely used these slave quarters associated with the Dickins plantation as well (United States Census Office 1850).

Dickins Homestead (40FY462), which is the manor house site associated with the Fanny Dickins plantation, was the first focus of excavation. Two seasons of excavation were conducted at this site during the 2011 and 2012 field schools (Kasper et al. 2024). During the excavation of the site, flotation samples were taken from various features and excavation contexts. **Figure 2.2** is a map of the Dickins Homestead site.

In 2013, under the direction of Dr. Kimberly Kasper, the Rhodes College Environmental Archaeology Field School began to focus on implementing household archaeological methods to better understand the lives of the people who were enslaved at the Fanny Dickins Plantation and nearby Cedar Grove Plantation. The Enslaved African and African American (EAAA) house sites associated with the Fanny Dickins and Cedar Grove plantations were both focuses of this research. Fanny Dickins EAAA III (40FY303) was the focus of the field school from 2013 to 2018. This site is one of three domestic sites occupied by enslaved residents of the Fanny Dickins (**Figure 2.1**). **Figure 2.3** presents the site map for Fanny Dickins EAAA House II and III. **Figure 2.4** is a drone photo of Fanny Dickins EAAA House III with the outline of the house structure in red.

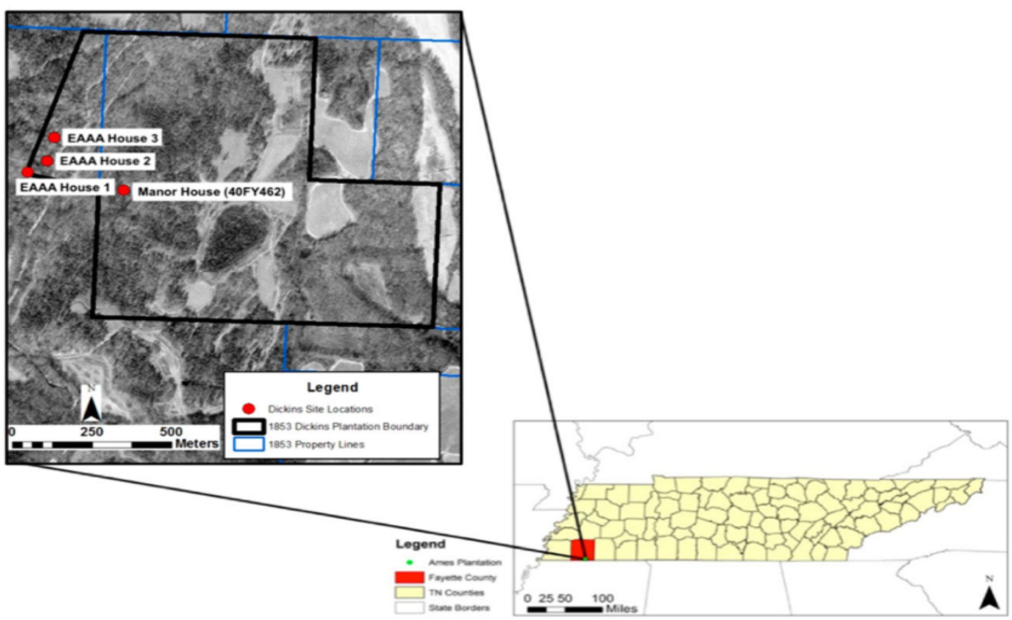

Figure 2.1 Sites associated with the Fanny Dickins Plantation (Kasper et al. 2022:Figure 1).

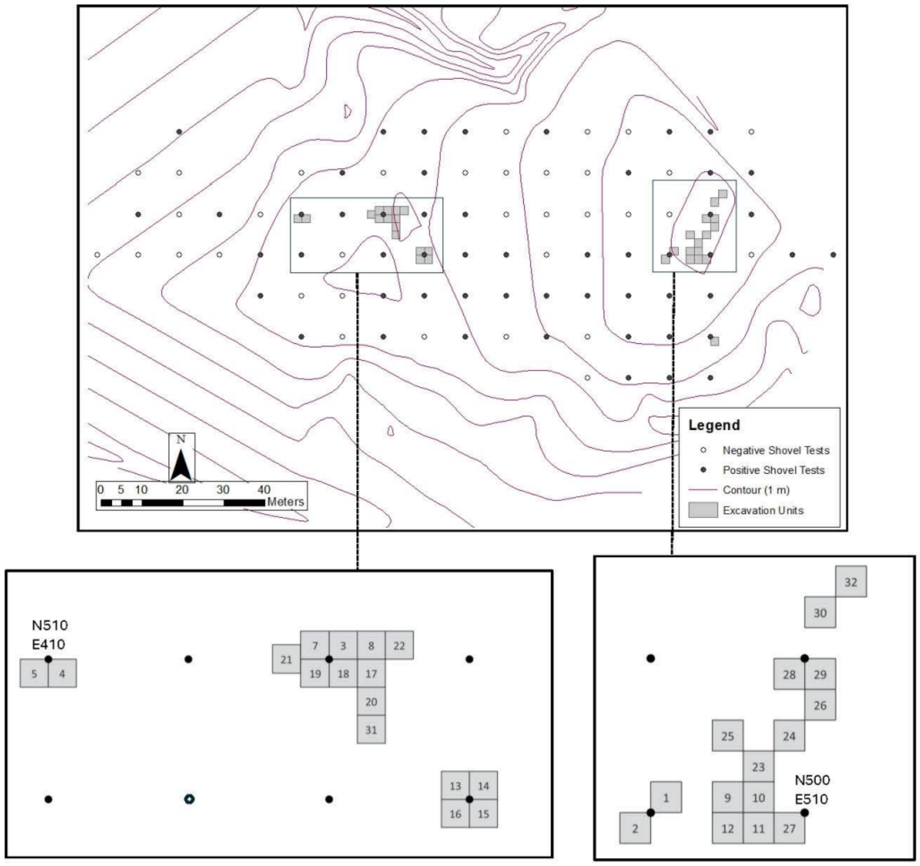

Figure 2.2 Dickins Homestead map (Kasper et al. 2024:Figure 7).

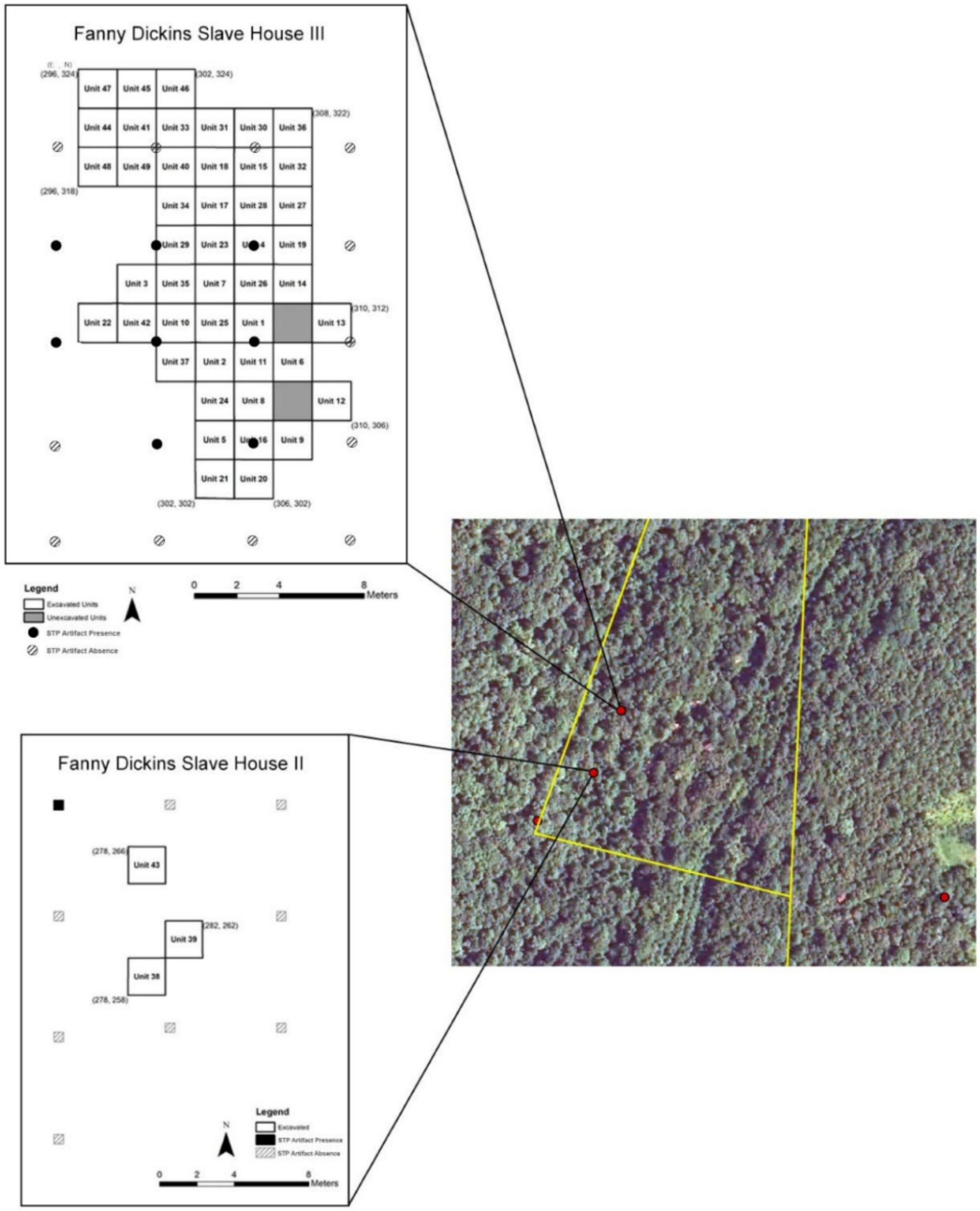

Figure 2.3 Fanny Dickins EAAA House II and III site map (Kasper et al. 2024:Figure 43).

Figure 2.4 Drone photo (Kasper et al. 2024) of 40FY303 with EAAA III house structure outlined in red.

The archaeological and historical evidence confirms that the Fanny Dickins site (40FY303) is a house site of enslaved Africans and African Americans. The variety of architectural artifacts, such as brick, nails, and window glass, and personal items including beads and ceramics, suggest that the people who were captive at this plantation lived here, or at one of the other two enslaved house sites associated with this plantation. Identification and flotation sample analysis of pit features and architectural features like floor stains and postmolds also affirm that enslaved people occupied this space (Kasper et al. 2022).

From 2019 to 2022, fieldwork shifted focused to the enslaved house site associated with Cedar Grove Plantation (40FY325) to gain a comparative perspective of small/medium (200+ acres) to large size plantations (5000+ acres). The Cedar Grove Plantation was owned and run by John W. Jones and Martha (Moorman) Jones, who arrived in Fayette County in 1826 to settle on land they inherited from Martha Jones's father, Micajah Moorman. The Jones family was one of the first to settle in this area of southeastern Fayette County. Cedar Grove plantation became one of the most productive cotton plantations in this area of the South. Jones operated Cedar Grove from 1826 until Emancipation (Kasper et al. 2024). Taylor (2020) discussed that Jones's success in operating Cedar Grove, and other holdings, is due to the labor of the enslaved African and African Americans that he exploited and oppressed. The land was then used for sharecropping during the postbellum period. At its height, this plantation encompassed 5,776 acres, over twelve times the size of Fanny Dickin's property. Since there was so much more land to cultivate, Jones enslaved 240 African Americans at the plantation's peak of production in 1850 (Fayette County Census 1850). John W. Jones died in 1879. His son, Caleb Jones, inherited his property and managed his business holdings. The Jones family remained on this land until they sold it to Hobart Ames in 1901. This event led to the eventual creation of Ames Plantation (Ames Plantation 2013).

At Cedar Grove (40FY325), excavators recovered hundreds of personal and architectural artifacts that are linked directly to the people who were enslaved at this plantation. This is a domestic site, but there is not yet enough evidence to suggest that this site only encompasses a house structure, especially when considering that there is a blacksmith shop and kiln that are both located within 100 meters of this site. Further archaeological investigation is necessary to determine if there are multiple house structures, or other various outbuildings, within this site. Since this was an area of heightened social activity, there are likely cellars, subfloor pits, and landscape features located within the site's boundaries which could be discovered through future excavation

(Kasper et al. 2024). Flotation samples were also taken from architectural features and excavation contexts at this site. **Figure 2.5** provides a site map of the Cedar Grove EAAA house site.

Excavation units at all three sites were excavated using arbitrary levels of 10 cm, using shovels and trowels. In addition to artifact recovery, flotation samples were taken from feature and some non-feature contexts at each site. Flotation samples were taken between 20 and 60 centimeters below the surface, and the majority of these samples were taken between 30 and 50 centimeters below surface, as all three sites were impacted by plowing.

The systematic collection of flotation samples from these three sites provides an opportunity to explore the use of plants by two enslaved households, as well as a manor house in a region where few subsistence studies have been conducted to date. Although the limited number of samples from Cedar Grove and Dickins Manor will not allow for detailed comparisons, the assemblage from the Fanny Dickins EAAA house III site provides useful information about how the people at these sites engaged with plants in multiple different ways.

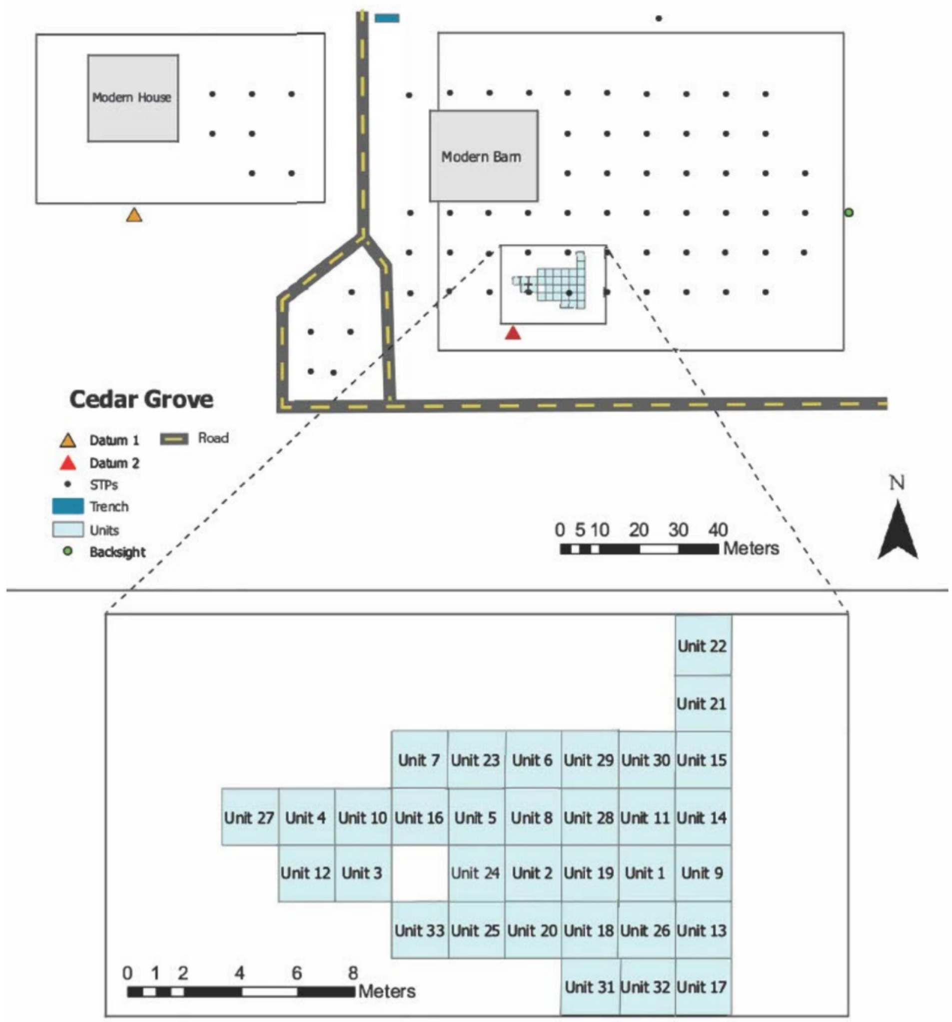

Figure 2.5 Map of Cedar Grove EAAA house site (40FY325) (Kasper et al. 2024:Figure 106).

CHAPTER THREE: ENVIRONMENTAL BACKGROUND

Given the importance of agricultural practices at the sites in question, an overview of historical and contemporary environments in West Tennessee is useful to review. As will be discussed further in Chapter 5, weather and soil conditions also affect stable isotope results, and therefore must be considered in this research.

Environmental Context of West Tennessee

The environment has a significant impact on how people live their lives. In agriculturally oriented societies, people strategically plant crops that will thrive in specific environmental conditions and meet their subsistence and economic needs. The plantation economy, which was wholly dependent on agriculture, exploited people for their labor by forcing them to participate in the cultivation of land for the economic gain of the plantation owner (Orser 1989). In the United States, the South became dependent on the plantation economy because this region's weather and soils were suited for agricultural success (Hillard 1985). West Tennessee has many environmental advantages, such as a fair climate and nutrient-rich soils, which allowed this region to sustain the extensive resource consumption and agricultural intensification demanded by the plantation model.

Geographically, the South is one of the largest regions in the United States; thus, it encompasses a very diverse landscape. **Figure 3.1** shows the eight level III ecoregions located within Tennessee. Ecoregions are areas where the type, quantity, and quality of environmental resources are similar. This framework was developed to systematically characterize and define distinctive environments across the United States. Ecoregions are useful tools for discussing resource consumption and availability, as they allow us to spatially visualize areas with distinct features, such as geology, soils, and climate. There are four levels of ecoregions, which increase in specificity (Griffith et al. 1998). Level III ecoregions suit this discussion of Tennessee, as they have been developed in collaboration with the US Environmental Protection Agency and the Tennessee Department of the Environment and Conservation (Griffith et al. 1998). Fayette and Hardeman counties, where Ames Plantation is located, contain two level III ecoregions: the Loess Plains and the Southeastern Plains and Hills, as shown in **Figure 3.1**.

The Loess Plains are irregular, rolling plains characterized by large deposits of loess, which are wind-blown silt deposits. This land is typically used for agriculture, with contemporary farmers producing crops of soybeans, cotton, corn, and sorghum, and rearing livestock. This ecoregion is also distinctive as there are several rivers with wide floodplains in the area. Soils in this region are generally described as silty (Griffith et al. 1998).

The Southeastern Plains and Hills have more rolling topography than the Loess Plains and are characterized by bands of sandy and clay soils. This land is primarily used for crops, pastures, and woodland (Griffith et al. 1998). The Cedar Grove plantation is located in the Southeastern Plains and Hills, while Fanny Dickins's plantation is located on the border between the Southeastern Plains and Hills and the Loess Plains, as shown in **Figure 3.1**. Reviewing the available ecological resources on this landscape helps us understand why this land was so well suited to the plantation economy.

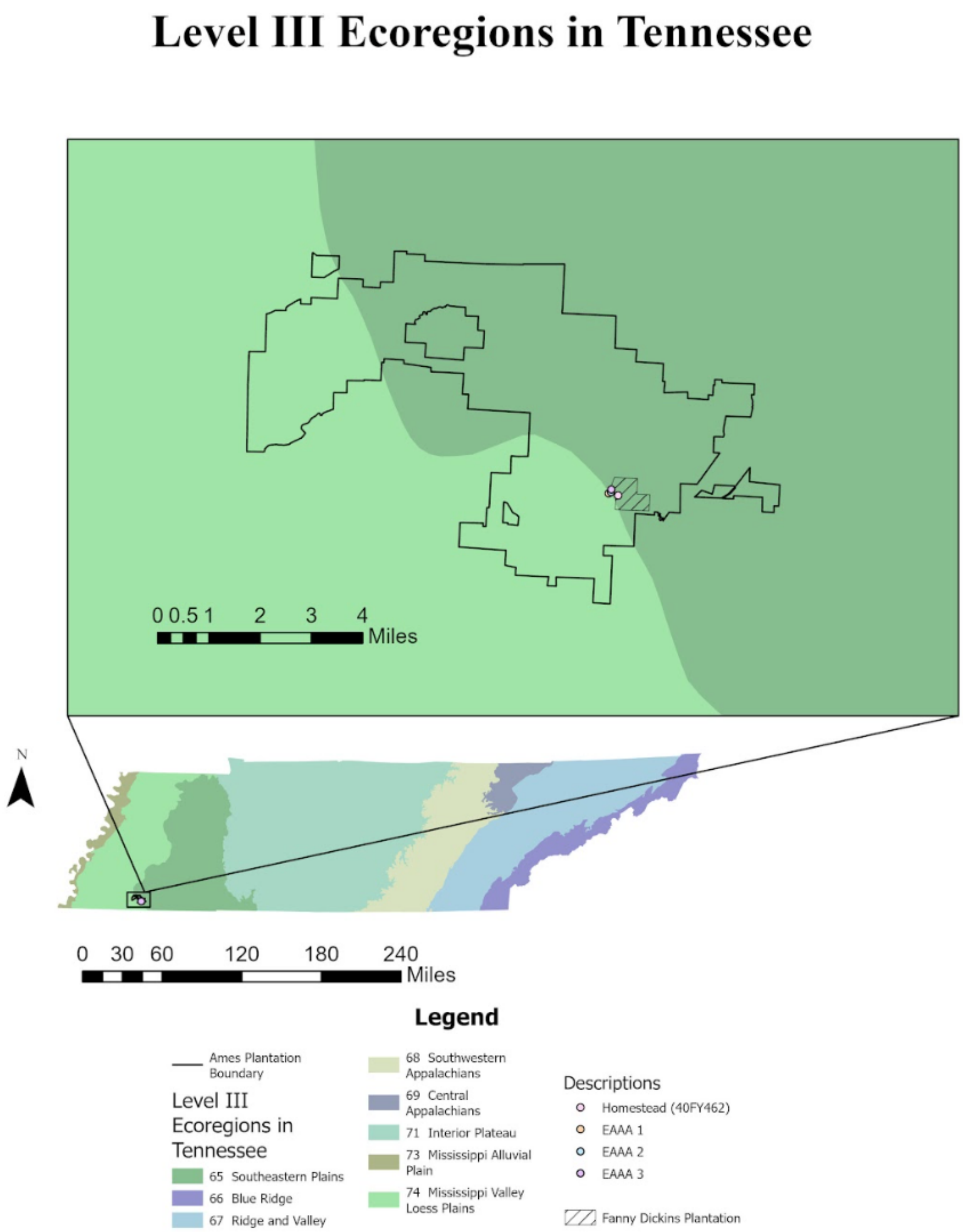

Figure 3.1 Level III Ecoregions in Tennessee in relation to Ames Plantation.

Soils in Fayette and Hardeman Counties

Healthy soils are necessary for bountiful crop production. Soil health is defined as "the capacity of soil to function as a vital living system, within ecosystem and land-use boundaries, to sustain plant and animal productivity, maintain or enhance water and air quality, and promote plant and animal health" (Doran and Zeiss 2000:3). Soil surveys allow us to evaluate the health of soils in specific areas. **Figure 3.4** depicts the Area of Interest (AOI) of a soil survey that was calibrated to evaluate soils at Ames Plantation and in the surrounding areas (Web Soil Survey 2025). An attachment to this thesis titled "Soil Data.xlsx" list the types of soil within this area of interest in Fayette and Hardeman counties, respectively. These tables also rate the soil's fertility by agricultural organic soil subsidence and organic matter depletion for each soil type. **Table 3.1** shows that 70.7% of the AOI has moderately high levels of organic matter depletion. This means that organic matter within these soils is not being replaced at a sufficient rate. Organic matter depletion can be offset by implementing agricultural management tactics, such as applying fertilizers to areas of cultivation, to ensure that the soil remains fertile.

Tables 3.2 and 3.3 show the National Commodity Crop Productivity Index (NCCPI) for soybeans and corn. This index is a model developed by the Natural Resources Conservation Service (NRCS) to assess the ability of soils to produce commodity crops (Albers et al. 2022). NCCPIs were calculated for corn and soybeans in this AOI, as these are Tennessee's two most prominent commodity crops in contemporary times. An NCCPI is not available for cotton in this AOI. Both NCCPI estimations illustrate that most of the land in the AOI has moderate inherent productivity, or moderately high inherent productivity for both corn and soybeans (Tables 3.2 and 3.3). This is significant as most of this soil is quite favorable for crop production.

While it is important to evaluate soil health on a larger scale, as local soil health is a good indicator of regional agricultural practices, we must also evaluate soil health at the site-level to understand how the soil at the site impacted cultivation processes in that location. **Figure 3.5** shows the soil types at the Cedar Grove EAAA House Site (40FY325) and the three enslaved African and African American house sites associated with the Fanny Dickins plantation. **Table 3.4** defines these soil types as Grenada soils (40FY303 and 40FY462) and Memphis silt loam (40FY325). These soil types are favorable for crop production.

Ultimately, it is important to consider soil health when examining the trajectory of agricultural practices in an area that people have cultivated for thousands of years. Just as the climate changes over time due to anthropogenic and natural causes, soil health also changes for these reasons, especially as people exhausted the land's resources to meet their needs and desires. This knowledge helps farmers develop plant management strategies to ensure that their crops get the nutrients they need, and their fields can sustain life for years to come. Gaining insight into soil health can also help us understand whether farmers in the past may have applied fertilizers to mitigate nutrient depletion.

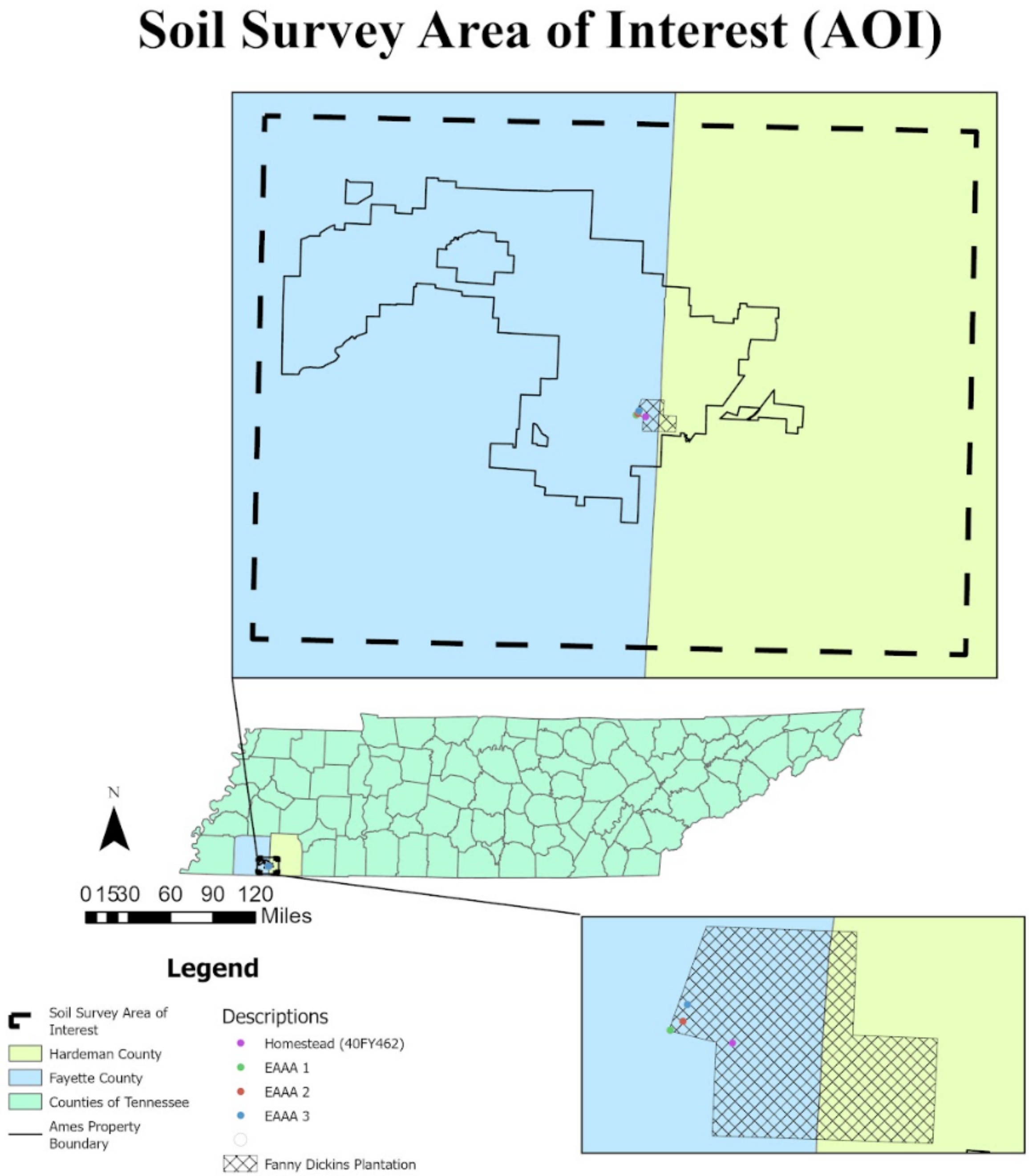

Figure 3.2 Soil survey Area of Interest (AOI) (Web Soil Survey Staff 2025).

Table 3.1 Organic Matter Depletion (Web Soil Survey 2025).

Organic Matter Depletion - Summary by Rating Value		
Rating	**Acres in AOI**	**Percent of AOI**
OM depletion moderately high	67,124.00	70.70%
OM depletion moderate	11,262.10	11.90%
OM depletion high	4,788.40	5.00%
Null or Not Rated	11,697.20	12.30%
Totals for Area of Interest	**94,898.60**	**100**

Table 3.2 Commodity Crop Productivity Index for Soybeans (Web Soil Survey 2025).

Commodity Crop Productivity Index (CCPI) for Soybeans Summary by Rating Value		
Rating	**Acres in AOI**	**Percent of AOI**
Moderate inherent productivity	66,127.50	69.70%
Moderately high inherent productivity	9,705.50	10.20%
Moderately low inherent productivity	6,882.90	7.30%
Low inherent productivity	484.1	0.50%
Null or Not Rated	11,671.60	12.30%
Totals for Area of Interest	**94,898.60**	**100.00%**

Table 3.3 Commodity Crop Productivity Index for Corn (Web Soil Survey 2025).

Commodity Crop Productivity Index (CCPI) for Corn Summary by Rating Value		
Rating	**Acres in AOI**	**Percent of AOI**
Moderate inherent productivity	64,277.60	67.70%
Moderately high inherent productivity	9,081.90	9.60%
Moderately low inherent productivity	7,852.10	8.30%
Low inherent productivity	1,988.30	2.10%
Null or Not Rated	11,671.60	12.30%
Totals for Area of Interest	**94,898.60**	**100.00%**

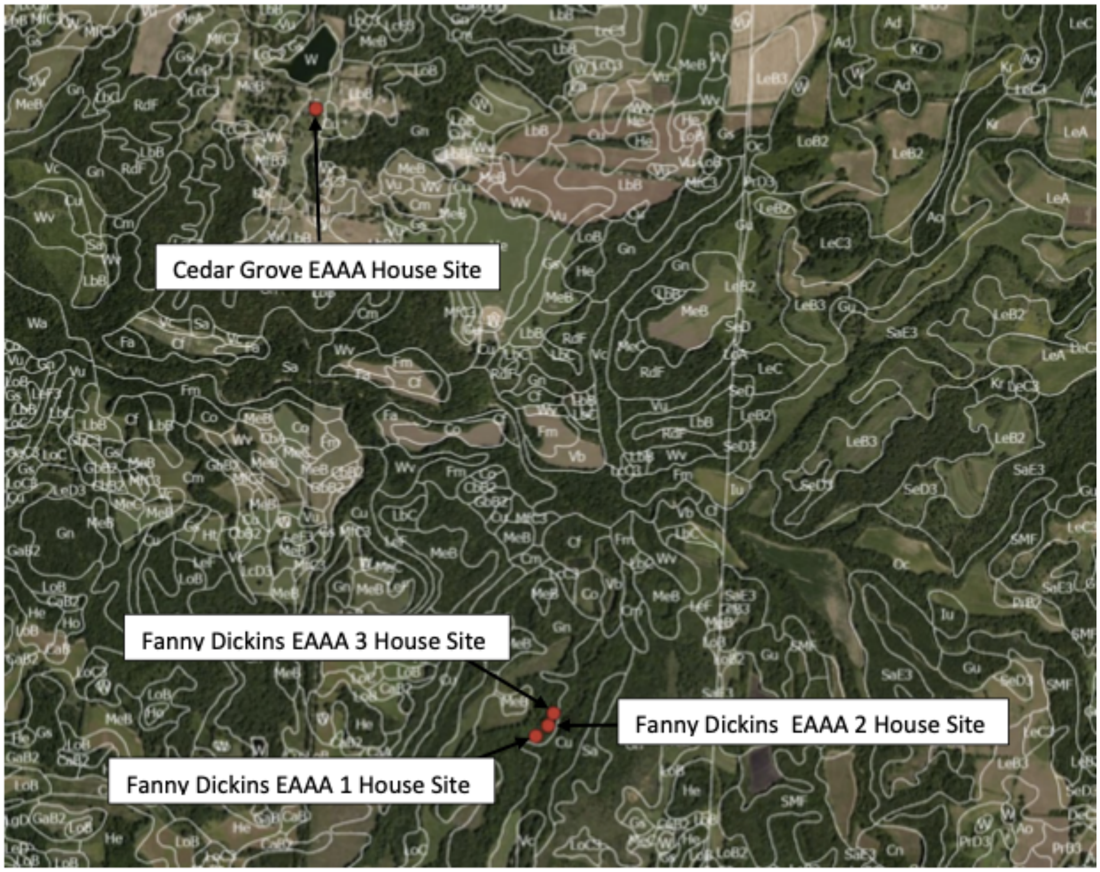

Figure 3.5 Soil Types at Sites Associated with the Cedar Grove and Fanny Dickins Plantations (Kasper et al. 2024:Figure 3; USDA NRCS 2024).

Table 3.4 Soil Types at Sites Associated with the Cedar Grove and Fanny Dickins Plantations (Kasper et al. 2024:Table 1; USDA NRCS 2024).

Map Unit Symbol	Map Unit Name	Drainage Class	Percentage
Gn	Grenada gullied land sandy	Deep to excessively drained sand	100%
MeB	Memphis silt loam, 2 to 5 percent slopes northern phase	well-drained soil formed in thick loess on fairly broad, gently sloping ridgetops	100%

Weather Conditions in Fayette and Hardeman Counties

The weather is a determining factor for crop growth. Although the South is generally characterized by its mild winters and warm, humid summers, weather variation is common within this region, which contributes to increased crop variability. County-level precipitation and temperature data for both Fayette and Hardeman counties are only available from 1895 onward (National Centers for Environmental Information 2025). While local weather data are limited, paleoclimatologists and archaeologists have used proxy environmental data and limited historical documentation as evidence of interesting weather patterns in the nineteenth century (Dodds et al. 2009). Notably, an extended drought period occurred across the southeastern and western United States in the mid-nineteenth century. Scientists predict that in Tennessee specifically, this drought was the most intense about 1860, and that it had long-lasting impacts on agricultural production, as water stress challenges plant growth (Dodds et al. 2009). **Figures 3.2 and 3.3** demonstrate that drought-like conditions in Fayette and Hardeman counties were persistent at the end of the nineteenth century, continuing until the mid-twentieth century. This environmental hardship likely contributed to the many difficulties that farmers in West Tennessee experienced during the postbellum period. These figures also demonstrate how variable the climate is. As the climate changes over time, so does people's ability to consume environmental resources. Thus, archaeological research must recognize that weather conditions informed social and physical landscapes of the past.

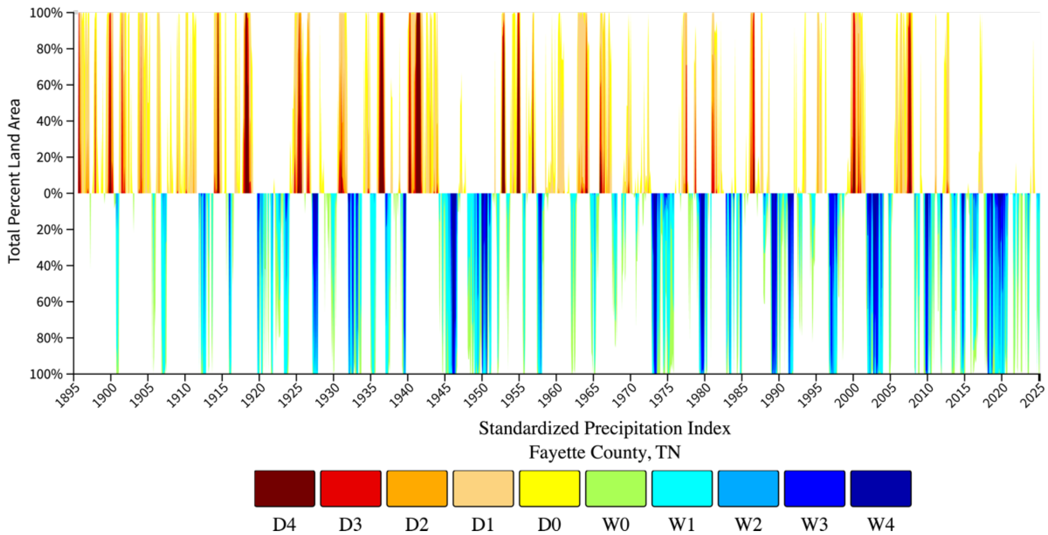

Figure 3.2 Weather data for Fayette County, Tennessee (1895 -2025) (National Center for Environmental Information 2025).

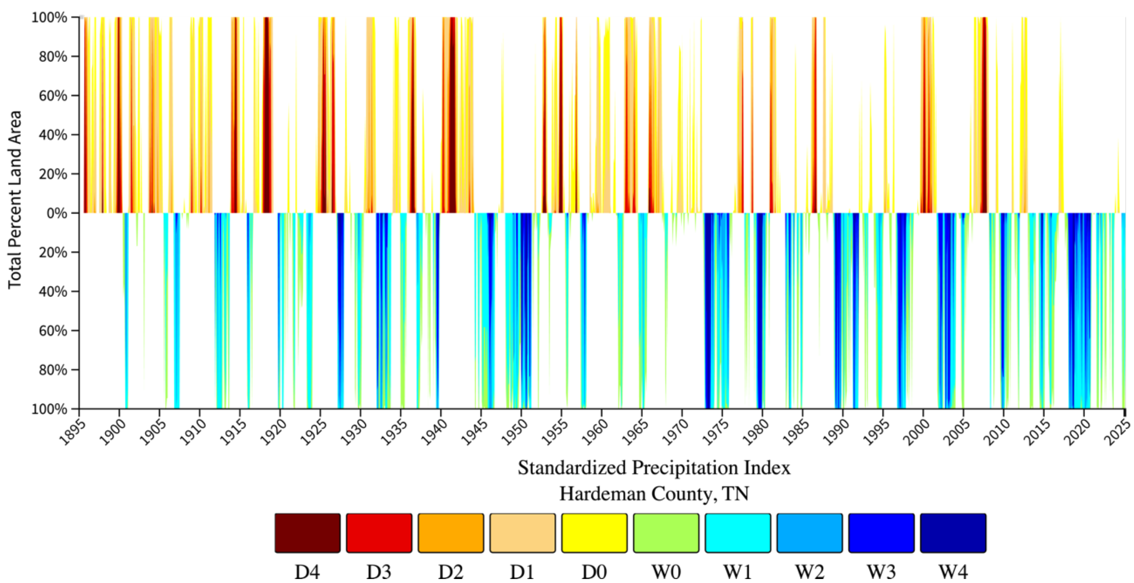

Figure 3.3 Weather data for Hardeman County, Tennessee (1895 -2025) (National Center for Environmental Information 2025).

CHAPTER FOUR: PLANTATION FOODWAYS AND AGRICULTURAL PRACTICES

While local environments present opportunities, parameters, and constraints within which people make a living, their decisions and actions are also shaped by the cultures in which they live. In this chapter, I discuss my anthropological approach to the plant assemblage data from the sites. I give an overview of foodways, particularly of enslaved Africans and African Americans and their enslavers. Among those foodways, I emphasize production and procurement, especially agricultural production on cotton plantations in West Tennessee.

Social Organization of Plantations

To reconstruct the lives of people who were enslaved on plantations in West Tennessee, we must better understand the social organization of these plantations, and the practices that inform this organization. Social organization explores the framework of a society and understands how a multitude of interactions inform the culture of this society. Plantations were organized as hierarchies, where the planters or overseers were at the top of the hierarchy, other white individuals fell in the middle of this hierarchy, and enslaved Africans and African Americans were at the bottom of this hierarchy (Orser 1989). Archaeologists have found evidence of this social hierarchy within the material culture of plantation sites (Otto 1984; Singleton 1985; Orser 1989). Plantation social organization was also dependent on who was present on the plantation. Some enslavers lived on plantations, and they oversaw the plantation themselves, or hired white overseers to do so. Some plantations had absentee owners who had enslaved drivers organize labor in their stead (Morgan 1988). Regardless of what type of social organization was present on a given plantation, social organization on plantations was inherently racist.

Social organization also includes the division of labor. There were two predominant types of labor organization on plantations. In task labor systems, enslaved people were assigned specialized tasks, and once they accomplished their tasks for the day, they could choose how to allocate the rest of their time, within the boundaries of what they were permitted to do by their enslavers (Morgan 1988). In gang labor systems, enslaved people were organized into groups based on their physical ability. These groups worked together to manage and plant crops (Morgan 1988). Gang labor systems were primarily utilized on plantations that grew crops like cotton, as this was the most efficient form of labor organization for these crops (Toman 2005; Olmstead and Rhode 2008). Olmstead and Rhode (2008) suggested that the gang labor system, fertile soils, and farming technologies led to this increase in productivity. Toman (2005) argued that the assignment of enslaved people to specific tasks based on each person's comparative advantage was the driving force of productivity for these plantations.

These two labor organization systems, however, were not exclusive. While one form of labor organization predominated many plantations, enslavers often utilized both types of labor organization to maximize productivity and profit. For instance, during the time outside of the planting and harvesting seasons, enslavers often shifted from gang labor organization to task labor organization to account for the variety and volume of tasks that needed to be completed.

While the gang and task labor systems had beneficial economic implications for enslavers, there were consequences of this productivity that negatively impacted enslaved people. To ensure that subsistence and other basic needs are met, enslaved people had to conduct additional labor than what was ordered by their enslavers. Scholars have used the economic term, own-account production, to describe the labor that enslaved people were doing to produce goods or services, such as food or craft goods, that solely met their own needs (Armstrong and Hauser 2017). Under the gang system, enslaved people had less time available outside of working hours for their own-account production, when compared to people who were enslaved on plantations that used task labor (Hong 2001; Bowes and Trigg 2012; Hacker 2016). Thus, enslaved Africans and African Americans practiced labor in different ways, dependent on what labor organization system their enslavers forced them to participate in, during a given season. This is relevant to the study of foodways, as enslaved people working in the gang system would have had less time to secure food resources for themselves and their families.

Practice Theory and Foodways

Practice theory serves as the theoretical framework for this research (Bourdieu 1977; De Certeau 1986; Giddens 1979). Practice theory derives from the Marxist concept of "praxis," which seeks to put ideas into action (Cipolla 2014). Practice theory helps us understand how individuals of the past interacted with each other and their surroundings, which allows us to view people in the past as active beings rather than passive ones. This theory identifies many behaviors and actions as "practices" that people perform daily for a variety of reasons.

Bourdieu (1977) explained that it is the repeated performances of these daily practices that lead to the development and reinforcement of culture, as the practices of individuals shape and are shaped by the practices of others. He also introduced the concept of “habitus,” which are the “norms and dispositions” that determine how people perceive and act in the world (Bourdieu 1977). Habitus is formed through the lens of culture, which is created by the cumulative practices of individuals. Giddens (1979) discussed the “duality of the structure,” which means that society influences practices, just as practices shape society. De Certeau (1986) introduced the concepts of “strategies” and “tactics,” which reflect the power dynamics that inform practices. He further explained that people who have power and control of capital practice strategies to maintain that power, while people who do not have power employ tactics, which are subversive and creative, to take power under limitations or systems of oppression.

Agency, which is the ability of people, groups, and material culture to shape society, is also a key feature of practice theory (De Certeau 1986; Cipolla 2014; Joyce and Lopiparo 2005). Some archaeologists and historians have used agency to discuss how enslaved people practiced small acts of resistance against their enslavers, as their enslavers sought to remove their agency (Fuentes 2016; Armstrong 2021). This particular application of agency has largely fallen out of favor, as this minimizes the violence that enslaved people were subject to (Johnson 2003). Ultimately, practice theory is important because it emphasizes that we must study daily tasks to understand how society evolves because of ever-changing social norms and economic strategies. Practice theory also serves as a valuable lens to understand the practices that shaped the archaeological record.

Food consumption is a practice mandated by necessity, but food related practices also have rich cultural value. For example, societies are organized around securing food resources; the necessity of food drives the advancement of science and technology; and people develop and share meaningful food-related traditions. Johannessen (1993) argued that archaeologists must study foodways, rather than just studying food, to understand the larger cultural and social significance of food and the many experiences related to it, as the study of food itself only tells us about what nutritional and caloric needs a given foodstuff meets. She defined the study of foodways as the production, storage, distribution, preparation, and presentation of food in social and cultural settings (Johannessen 1993). Foodways also explore how people in the past met their biological and cultural needs for food in ever-changing physical, social, and economic landscapes (Peres 2023; Scarry et al. 2022). Thus, investigating foodways, rather than just food, allows us to evaluate the significance of many foodways-related practices that are necessary to ensure that food is available for consumption. Atalay and Hastorf (2006) demonstrated how practice theory is a suitable lens for studying foodways. They explained that food is the most important factor in shaping individual identities and community practices, citing food as the ultimate form of habitus (Atalay and Hastorf 2006).

Scholars have continued to study the connections between food-related practices and craft- and farming-related practices (Gokee and Logan 2014; Stahl 2014). These connections are significant in that one set of practices frequently shapes other practices. For example, farming is related to food production and is therefore part of foodways, but it is also related to husbandry practices, blacksmithing (for tool production and maintenance), and soil maintenance. The study of foodways is a prime avenue to explore the relationality of practices. Collecting and interpreting paleoethnobotanical data are thus essential for understanding how the procurement and consumption of food and other plant resources were intertwined with people's daily economic practices (Atalay and Hastorf 2006).

Practice theory has informed my study of enslaved foodways and guided my research design. Learning about how enslaved African and African American communities negotiated this oppressive system tells us about how they shaped society. Enslaved communities were constantly learning, developing, and performing practices that met their food, medicinal, and shelter needs. Securing food requires many practices, especially production-related activities, in which enslaved people would have had to practice to survive, but they had little time to ensure that their subsistence needs were met.

Cultural practices also inform foodways, as cooking is inherently a cultural practice that keeps culinary traditions alive. The daily and seasonal practices that I consider here include agricultural production tasks and procurement of wild plant resources. Enslaved people performed these within the structure of the racist slave system of the South. But these practices were also informed by cultural knowledge passed down from elders within their own community about how to farm and keep a garden, raise livestock, cook, store food for winter, and collect and use plants for health and well-being. The performance of these practices aided the survival of cultural practices, including culinary traditions, as well as the more literal survival of the community.

Crop Seasons

Crop seasons, which include the planting, growing, and harvesting times for crops, are important to be cognizant of, as they are a significant limiting factor for crop availability, especially before the twentieth century. Crop seasons also indicate when enslaved people had more time for own-account production, as some seasons required less labor than others (Hong 2001). **Table 4.4** shows the planting and harvesting times for crops that are frequently grown in Tennessee. This table helps us understand how laborious tasks like planting and harvesting occurred cyclically, as these tasks are dependent on crop seasons.

Additionally, this table encourages us to consider when certain types of crops were available. In contemporary times, people have access to most crops during all seasons of the year, due to revolutionary technological advancements in food preservation and distribution. In the nineteenth century, most people were limited to locally grown produce when it was seasonally available. Enslaved Africans and African Americans often had the most limited access to fresh produce, especially those who were not permitted to sell or purchase goods at local markets (Hilliard 2014). Enslaved people could preserve fresh foodstuffs during times of harvest to ensure that they would have enough food to eat during times of food stress, but since the harvest season was such a demanding time, food preservation was yet another time-intensive task that competed for their limited time. Archaeological evidence of storage pits, granaries, and specialized ceramics, for example, demonstrates that enslaved people used a variety of techniques to preserve plant and animal food resources as they were seasonally available (Covey 2007; Samford 2007; Bowes 2011; Bowes and Trigg 2012). People have always organized their lives around food, but people who are dependent on seasonal plant resources must incorporate preservation techniques and practices to secure these foodstuffs for their long-term needs. Nineteenth-century preservation techniques, such as drying, salting, pickling, smoking, and sugaring were derived from African, Indigenous, and European traditions (Covey and Eisnach 2009). In addition to using root cellars for food storage, enslaved people also preserved vegetables by burying them in the ground to preserve them in the winter (Covey and Eisnach 2009).

Crop seasons also inform labor organization in gang-system plantations. Typically, enslaved Africans and African Americans labored for six days each week, with a day away from laboring for the plantation on Sundays and the occasional half day on Saturdays (Hong 2001). Saturday afternoons and Sundays, however, were not times of rest; rather, these were times that enslaved people practiced gardening, went to the market, fished, repaired their homes, sharpened their tools, visited spouses and family members, and did other tasks to prepare for the week ahead. Harvest season, which occurred in the fall and early winter, required the most intense labor, followed by spring, when the fields had to be prepared for planting (Hong 2001). Enslaved people would have had more time, comparatively, to devote to own-account production outside of the harvest and planting seasons, but they were still responsible for many other tasks on the plantation, such as building repairs or cotton processing, that were dependent on immediate labor. An 1844 farm journal for the Poplar Forest plantation lists many daily tasks, such as digging drainage ditches, building roads, and cutting firewood, that enslaved people were forced to conduct outside of the harvest and planting seasons (Hutter Farm Journal 1844). This demonstrates that there was always work to be conducted to maintain the plantation.

On cotton plantations, the spring and fall months were the busiest seasons for enslaved people, who spent the spring removing old stalks, plowing, bedding, planting, and hoeing. In the summer, they had to pick the cotton and process it through a cotton gin to remove the seeds. The harvest season was so busy that some enslavers paid those they enslaved to work during the time when they were not assigned labor (Hong 2001). The intensive seasons for cotton production align with the planting and harvest seasons for many crops that enslaved people would have foraged for or cultivated during through own-account production meant that enslaved people had to strategically plan their already limited time for own-account production to ensure that they could complete all tasks and chores that were necessary for their survival (Hong 2001; Mrozowski et. al 2008; Lee 2016). Subsistence crops were also grown on cotton plantations, and enslaved people were tasked with cultivating these crops, especially when the labor demands for cotton were low, outside of the planting and harvesting seasons. Ultimately, crop seasonality has a large impact on labor organization and food availability within plantation settings.

Table 4.1 Crop Seasons of Commonly Grown Crops in Tennessee.

Crop Seasons of Commonly-Grown Crops in Tennessee			
Common Name	**Scientific Name**	**Planting Season**	**Harvesting Season**
Corn	*Zea mays*	Spring	Fall
Cotton	*Gossypium* sp.	Spring	Fall
Sorghum	*Sorghum* sp.	Spring	Fall
Hay	various	Fall or Spring	Summer
Oat	*Avena sativa*	Fall or Winter	Summer
Tobacco	*Nicotiana tabacum*	Spring	Summer
Wheat	*Triticum* sp.	Fall	Summer
Barley	*Hordeum vulgare*	Fall or Spring	Spring or Summer

Enslaved African and African American Subsistence Strategies

Through paleoethnobotanical research and historic documentation, archaeologists have learned that many enslaved Africans and African Americans strategically supplemented the rations that they received from their enslavers in several different ways (Bowes and Trigg 2012; Greer 2025; Hilliard 2014; Heath and Bennett 2000; Mrozowski et al. 2008). This diet supplementation is discussed by archaeologists as a strategy that enslaved people employed to ensure that their subsistence needs were met. McKee (1999) viewed the food system on plantations from the perspective of the people who were enslaved on these plantations. He explained that enslavers used the rations that they provided for those whom they enslaved as a mechanism of control over these people, and the enslaved communities resisted this control by supplementing their diets. McKee (1999) also grounded his discussion of plantation foodways in historical documentation of practices such as rationing and enslaved production of food

Heath and Bennett (2000) discussed yard spaces found adjacent to domestic areas where the enslaved lived. Not only were these yard spaces a significant place of gathering and community, but this land was also often used for gardening and raising small livestock, such as chickens. Enslaved individuals tended these gardens when they were not working, and here they cultivated many plants and herbs to have additional food resources. At the Poplar Forest Quarter site, part of a plantation owned by Thomas Jefferson, archaeologists recovered many remains from plants including fruit, nutshell, weedy seeds, and wood found within the plantation yard. Among other findings, the results of their macrobotanical analysis demonstrate how the enslaved used yard spaces to successfully supplement diets (Heath and Bennett 2000).

These foodways are also indicative of the many social dynamics and interactions on plantations. Bowes (2011) discussed the relationship between the enslaved and their enslavers at Poplar Forest, during the mid-nineteenth century when the plantation was owned by Edward Hutter. Through macrobotanical analysis of a storage pit located at an enslaved house site, Bowes (2011) found evidence of food received from the Hutters, food cultivated in gardens, and food gathered in the wild. Bowes (2011) referred to these methods as provisioning, production, and procurement, respectively. This phrase is commonly used by archaeologists to refer to the strategies that enslaved people used to meet their subsistence needs. Bowes and Trigg (2012) conducted macrobotanical analysis of one EAAA house site and reviewed previously-conducted macrobotanical analysis of flotation samples from enslaved house sites at Poplar Forest. They argued that the botanical remains from these eighteenth- and nineteenth-century contexts allow us to learn more about enslaved subsistence strategies and the daily practices of enslaved people. They found that enslaved people had a greater ability to supplement their provisioned food resources when Jefferson was less involved in the management of this plantation and under Hutter's management than they had when Jefferson was most actively involved in plantation management. Henderson (2013) analyzed flotation samples from the Wingo site, which is an enslaved African and African American house site at Poplar Forest. Within her macrobotanical analysis, she found that enslaved people continued to find pathways to feed themselves, even amidst an ever-changing social landscape (Henderson 2013; Heath et al. 2015).

While the discussion of plants on plantation sites typically ties back into a conversation about foodways, there were many other reasons beyond subsistence that enslaved people chose to spend their time cultivating or collecting plants. Lee (2016) explored enslaved African and African American use of plants for well-being at Poplar Forest. She explained that the use of plants for well-being by both enslavers and enslaved people were practices that were developed out of African, Indigenous, and European cultural traditions (Lee 2016). At Poplar Forest specifically, Lee posited that enslaved communities used plants like jimsonweed, purslane, and knotweed, to meet their medicinal needs (Lee 2016). She argued that these plant resources would have been used to supplement the limited medical care that enslaved people received from their enslavers.

Reifschneider and Bardolph (2020) discussed plant remains found on Estate Cane Garden, a plantation hospital site in St. Croix, US Virgin Islands. Here, they explored the relationship between the enslaved populations and the plants in the garden used for food and medicinal purposes. They framed their study on the concept of well-being by examining how these plants positively impacted the medical and dietary needs of enslaved patients and workers at this hospital.

Mrozowski and colleagues Franklin and Hunt (2008) compared the macrobotanical assemblage from the enslaved domestic site associated with Rich Neck Plantation to four other enslaved domestic sites in Virginia, which were all occupied during the eighteenth century. The authors demonstrated that enslaved Africans and African Americans at Rich Neck Plantation implemented household economic strategies to meet their subsistence needs through procurement. They also discussed the use of plants for well-being by explaining how violets would have been planted intentionally for landscaping.

Hacker (2016) and Humes (2023) have also explored foodways on plantations through macrobotanical analysis of sites at Monticello, which is an eighteenth-century plantation associated with Thomas Jefferson. Hacker studied the macrobotanical remains from Site 8, which is a slave quarter tied to the plantation (Hacker 2016). She found that the people enslaved on this plantation employed strategies to meet their subsistence needs such as cultivating crops that were considered "low investment," meaning that these plants produced a hearty output, but they did not require much maintenance. Hacker (2016) also proposed that the transition from the gang labor system to the task labor system, which occurred as Jefferson moved the plantation from tobacco to wheat production, allowed the enslaved to have more time to forage for plants on the landscape. This mixed foraging/low investment model allowed enslaved people to add variety to their diets, and it consumed less of their little free time when compared to other methods for meeting subsistence needs.

Humes (2023) analyzed samples taken from the South Pavillion Kitchen at Monticello, which is where enslaved cooks prepared meals for the Jeffersons. Through this work, Humes explored the relationship between the enslaved cooks and their enslavers through food. Humes compared this kitchen site to the slave quarter site that Hacker (2016) analyzed to understand how the experiences of the enslaved cooks differed from those of the enslaved field laborers. Humes (2016) found that enslaved cooks had less free time than field laborers, as their schedules were dependent on their enslaver's needs, but they also had better access to higher-status food, like coffee, than field laborers did.

Subsistence strategies and risk management were factors that enslaved people considered every day to ensure that there was enough food to go around and that they had plant resources to treat medical conditions, if necessary. Since there are so many different ways to meet subsistence needs, and there are many external factors such as crop seasonality and different organization of labor, this process was highly variable.

Foodways of Enslavers

In addition to growing cash crops, food crops, and feeding their own families, enslaved Africans and African Americans were often responsible for cooking the food for their enslavers. Deetz (2017) explored the role of enslaved cooks in Virginia and found that they were largely responsible for creating the tradition of Virginian hospitality, as they were the ones who cooked most of the meals to serve the enslavers and their guests.

Additionally, Deetz (2017) discussed the imagery surrounding enslaved cooks, such as that of Aunt Jemima and Uncle Ben, and explains how these are still common perceptions within our culture today.

Enslaved cooks were not just cooking on their own plantations. Sometimes they were hired out to cook at other places. Barton (1997) discussed the practice of slave owners hiring out their slaves to different members of the community in Bourbon, Kentucky. This occurred frequently in this region of Kentucky, as enslavers were not planting cash crops which would require a large labor force. Because of these different labor needs, few members of the community were enslavers, and even fewer owned more than a few slaves. Instead, landowners would seek to hire enslaved individuals, who were leased to them at a premium. This practice was particularly common with enslaved women who had a specialized skill set, such as cooking, washing, or the ability to care for children (Barton 1997). This practice was also commonplace in other parts of the South. Lee (2016) discusses that this practice occurred at Poplar Forest, as the Hutter family would loan, purchase, and sell enslaved labor with other plantation owners in this area of Virginia. Thus, these enslaved cooks had a larger impact on the foodways and broader food culture of the region. This influence extended far beyond the plantations that these individuals were enslaved on.

While enslaved people cooked for their enslavers, this does not mean that they were eating the same quality or amount of food as their enslavers. Hillard (2014) discussed the consumption of pork on plantations in the South, including those in Tennessee. He explained that many southern plantations had problems raising hogs, which was unfortunate as they were a major source of protein and very important to the idealized diet of this time. The enslaved implemented new methods of animal husbandry, which ensured that there would be enough pork. Hillard (2014) acknowledged that enslaved people were only getting the standard ration of this pork, which was not enough sustenance. Enslaved people often had to rely on fish, salted meat, and in some cases, they even adopted vegetarian diets (Klippel et al. 2011; Hillard 2014).

While rations for the enslaved were decently documented in census records and by their enslavers, meat consumption for white people, including planters, was not well documented. Hilliard (2014) estimated that white people ate around 150 pounds of meat per adult annually, which was the national average during the antebellum period. It is likely that higher-class enslavers would have had even more access to meat (Hilliard 2014).

Ultimately, understanding the foodways of enslavers serves as evidence of the entanglement between enslavers and the enslaved regarding foodways. The enslaved were often directly responsible for preparing the meals their enslavers were eating, but this did not mean that they were eating the same food as their enslavers. Those enslaved who were not cooks also had an impact on foodways, as they were heavily involved in the agricultural process, which also dictated foodways.

Regional Studies of Plantation Foodways in the Upland and Deep South

It is important to highlight archaeological studies of contemporary sites in West Tennessee to better understand the common material culture and environmental factors within the region and during this time period. The region that my study is focused on is nineteenth-century West Tennessee. Foodways at the Fanny Dickens EAAA House III site have been discussed in a few publications thus far. Kasper (2020) used zooarchaeological remains from the EAAA House III site and oral histories shared by Dwight Fryer, a descendant of Jane Dickins, who was enslaved on the Fanny Dickins plantation, to discuss barbecue traditions in West Tennessee. Kasper, Evans, Fryer, and Norton (2022) explored enslaved lifeways at Fanny Dickins plantation using artifacts and oral history. Here, they explained that artifacts within this assemblage affirm that Dickins allowed those whom she enslaved to practice activities like gardening and smoking (Kasper et al. 2022). While researchers have been committed to studying enslaved lifeways at Ames Plantation since the early 2000s, there has not been any other long-term research conducted on plantation sites in West Tennessee. Fortunately, there has been extensive research conducted on plantations in other parts of the South that can inform my studies.

The closest heavily investigated plantation site, both geographically and temporally, is the Hermitage, which is the plantation and home of US President Andrew Jackson. McKee (2000) presented an overview of archaeological work done at the Hermitage. He discussed enslaved African and African American foodways from a zooarchaeological perspective, and explains that pork comprised between 70 and 90 percent of the meat portion of enslaved diets, but they also supplemented this with fowl, marine resources, and small mammals (McKee 2000). Thomas (1998) presented archaeological data from the excavation of multiple enslaved domestic sites at the Hermitage. Through the excavation of these sites, archaeologists found a variety of food-related artifacts, including bone-handled utensils, firearms parts for hunting game, and a variety of different ceramic sherds (Thomas 1998). He also presented faunal data, as they found pigs, cows, and sheep at this site. These data allowed Thomas to conclude that these house sites were the location of most, if not all, of the food production for enslaved individuals. Hollenbach and Galle (2019) presented macrobotanical data from three contexts at the Hermitage at the 2019 Society for American Archaeology Conference. They analyzed flotation samples from the field quarters, First Hermitage, and the mansion brickyard, which were all spaces in which enslaved people interacted daily. A variety of plant remains, including corn, cotton, tubers, and cucurbits, were found in these samples, and the authors grouped them according to how enslaved people would have accessed these plants. They found plants that would have been grown in fields as crops, in kitchen gardens, in orchards, and in the wild. Additionally, they noted that many of these plants would have been used for medicinal purposes. This data demonstrates that people enslaved at the Hermitage actively managed the landscape through the cultivation and procurement of these plant resources.

Amy Young (1993) compared faunal assemblages from four plantation sites across the Deep and Upper South to determine if there were differences in enslaved foodways on coastal and non-coastal plantations. This study is geographically relevant, as Young focused on the Mabry Plantation site in east Tennessee. Young (1993) found that people enslaved on inland plantations relied on mammals for food more than aquatic resources.

Peres (2014) presented data on foodways of the antebellum Upper South. This study is focused primarily on foodways in Kentucky, with reference to Tennessee. Here, Peres studied the foodways of three groups: slaves of middle to upper-class plantation owners, middle-class planters, and upper-class enslavers. She discussed the idealized Upper South diet and explained how that fictionalized, but perceived, diet was not the reality for most of these groups. In actuality, meat from domestic farm animals was not consistently available to certain classes, and people supplemented their diets by hunting wild animals. Peres supported this claim through faunal analysis, and she also found that domestic animals were not as impactful on foodways here as previously thought (Peres 2014).

The limited number of studies that are comparable to my sites, in terms of both geography and time, demonstrate that there is so much more archaeological work, both in terms of excavation and analysis, that needs to be done to learn more about foodways on plantation sites in West Tennessee.

Nineteenth-Century Fertilization Practices

In their efforts to secure sufficient food, enslaved people may have also used fertilizers to improve the growth of their kitchen gardens. Fertilization is the practice of restoring soil health through the addition of organic or inorganic substances to soils or plants. Organic fertilizers consist of plant- or animal-based materials, such as manure, guano, or wood ash. Guano is manure from birds and bats that has very high $\delta^{15}N$ values, as these seabirds and bats are at the top of their food chains, and nitrogen levels increase as trophic levels increase. Inorganic fertilizers, which are often described as chemical fertilizers, are human-made substances designed to replenish specific nutrients. The three primary nutrients in fertilizer are nitrogen (N), potassium (K), and phosphorus (P) (Reill 2019). These nutrients are variable in organic fertilizers, while the levels of these nutrients in inorganic fertilizers are tailored to their intended use. Inorganic fertilizers are often derived from organic sources.

Farmers have used fertilization practices to replenish the nutrients in soil as early as Europe's Neolithic period (Bogaard 2013; Scharl et al. 2023). Researchers previously posited that farmers would settle in areas with the best soils and most favorable climates, so fertilization practices would be unnecessary until the land had reached a level of exhaustion (Bogaard 2004). New data suggest that crop cultivation has an immediate impact on soil health, as it disrupts important biogeochemical mechanisms and cycles that regulate soil health. These data affirm that fertilization practices are necessary to maintain soil health under any level of agricultural intensification (Admundson et al. 2015; Scharl et al. 2023). Since agricultural management is dependent on a variety of different factors (including climate, soil health, and available labor), there is a wide range of variability in how farmers implement fertilization practices.

Southern farmers in the nineteenth century were engaging in conversations and developing technologies and practices to increase their crop yield, reduce pest interference, and plant and harvest crops more efficiently. Periodicals like *The Southern Planter* and *The Old Farmer's Almanac* were sold and distributed to advertise equipment and disperse knowledge of farming practices. In the March 1867 issue, *The Southern Plante*r warned farmers about "the supposed exhaustion of soil from the modern agricultural system" and encouraged them to manure their fields to return nutrients to the soil (Anderson 1867:72). Another edition contained a letter from a farmer who shared their experience incorporating liming into their fertilization practices (JMH 1853). This farmer cultivated two fields (one with guano and lime, and one with guano only) and found no significant difference between the crop output of the two fields. The farmer conveyed disappointment, but also shared that there must be a scientific reason why this liming was not successful (JMH 1853). The frequent mention of fertilizer in these publications demonstrates that poor soil health was a significant concern for farmers, and they were actively looking for ways to better soil health to increase their crop yield and their profits. Hilliard (2014) also noted that southern farmers used cottonseed, discarded as part of processing in cotton gins, as fertilizers for fields as well as feed for cattle relatively early in the nineteenth century.

McKinley (2014) discussed the discrepancies between antebellum fertilization use by farmers in the North and the South by explaining that farmers in the North used fertilizers much more frequently than farmers in the South in the early nineteenth century. Many Southern farmers were slow to adopt specialized fertilizers, dismissing them as "book farming," meaning that not all farmers were convinced that science had value in creating farming practices (McKinley 2014). Farms in the Deep and Upland South also had been under European cultivation for a shorter period of time than farms in the Northeast and Mid-Atlantic, which had been using European cultivation practices since the seventeenth century. Although imported and inorganic fertilizers were less popular in the South than they were in the North, these fertilizers and organic fertilizers like manure and ash were used in the antebellum South (McKinley 2014).

Ross (2024) argued that there was a Southern market for imported fertilizers before the Civil War. As early as 1850, farmers in the Middle Atlantic region, which includes Virginia, Maryland, Delaware, and the District of Columbia, as well as farmers in the Carolinas and Georgia, were importing guano from Peru to fertilize their fields (Ross 2024). For example, Edward Hutter imported guano to fertilize the fields at Poplar Forest in the 1850s, and Thomas Jefferson had previously used other types of organic fertilizer at Monticello and Poplar Forest in the late eighteenth and early nineteenth centuries (Hutter Farm Journal 1844). Farmers were reliant on this guano to make nutrient-stripped lands profitable again (Ross 2024). Additionally, Ross (2024) also discussed that the guano market collapsed during the Civil War because Southern farmers were the main consumers and the Civil War disrupted cultivation and supply chains, demonstrating that many farmers in the South bought into this industry to better their soils. Ultimately, fertilization practices were used by at least some Southern farmers in the nineteenth century, but they were not universally applied, which makes this an interesting practice to explore archaeologically.

In Fayette County, soil health and fertility were reported to the Tennessee State Government by Fayette County resident Rice Bond (1858). Bond (1858:276) engaged in the conversation about book farming, explaining that "Scientific farming is nothing more than farming according to our experience and knowledge. Theoretical or book farming is not always in accordance with our knowledge and experience." Here, Bond explained that farmers have developed wisdom from years of engaging with plants, and they can apply scientific farming practices without getting lost in the jargon that theoretical farming presents. Bond (1858) then discussed specific tactics to West Tennessee that farmers should implement to mitigate the soil nutrient depletion that cotton farming causes. Bond called specifically for crop rotation, drainage, and fertilization via manure. Bond explained that farmers in West Tennessee need not purchase guano or manure; rather, they should use the manure that is plentiful on their own farms instead.

Ultimately, fertilization is a crucial step in ensuring crop productivity, whether those crops are being used to ensure food security or they are being sold for profit. Because there are many types and applications of fertilizers, there are many different ways for people to practice the fertilization of crops.

CHAPTER FIVE: METHODS

To explore enslaved foodways in West Tennessee, I analyzed macrobotanical plant remains from flotation samples collected from the three sites, Fanny Dickins EAAA House III (40FY303), Widow Dickins (40FY462), and Cedar Grove (40FY325). The methods I employed for these analyses - both paleoethnobotany and stable isotopes - are presented here. These two proxies work in tandem to answer my research questions.

Paleoethnobotany and Its Applications to Archaeology

Paleoethnobotany is the study of the interrelations between people and plants in the past (Hastorf and Popper 1988; Marston et al. 2014). Paleoethnobotanical methods are grouped according to whether the botanical remains of focus are visible to the naked eye or not. Macrobotanical remains, such as nutshell and seeds, can be seen with the naked eye, while archaeologists must investigate microbotanical remains, such as starch grains, pollen, and phytoliths, using high-powered microscopes (Gallagher 2014). Paleoethnobotanical analysis has greatly informed our understanding of foodways and environments of the past.

Macrobotanical analysis is incredibly informative for identifying plants that people interacted with in the past and reconstructing past environments. Macrobotanical remains are preserved within the archaeological record through dry preservation, wet preservation, carbonization, plant impressions, and mineralization (Gallagher 2014). Gallagher (2014) noted that archaeologists study macrobotanical remains from multiple different contexts, including those that are directly related, indirectly related, and even not related to anthropogenic use, as well as those plants that are brought in by post-depositional processes to understand past environments and foodways.

White and Shelton (2014) discussed the various methods that archaeologists use to separate macrobotanical remains from the matrix that surrounds them, including wet screening, dry screening, flotation, and wash-over techniques. These can be done using various methods; for example, flotation can be done by hand or with machine assistance. White and Shelton (2014) explained that while researchers take the effectiveness of these methods when choosing how to process their samples, it is often practicality that determines which method is used.

Macrobotanical Methodology

To understand how people enslaved on these cotton plantations supplemented their rations to feed their families and tend to their well-being, I analyzed macrobotanical plant remains from 27 samples. Of these samples, 23 are from Fanny Dickins EAAA House III (40FY303), two are from Widow Dickins (40FY462), and two are from Cedar Grove (40FY325). An attachment to this document, titled "Flotation Sample Provenience Information.xlxs" lists the provenience information for these samples. Sampled contexts include pit features and linear stains. All of the macrobotanical remains recovered from these sites are carbonized, since the site is not waterlogged or dry enough to preserve botanical remains in alternate ways (Marston et al. 2014).

Excavators collected soil samples from features and additional contexts. Soil sample size is dependent on the size, shape, and amount of feature fill, but they range from 10 to 30 liters per sample. Typically, all of the feature fill was taken as a soil sample. After the soil samples were collected in the field, they were brought to the laboratory and processed in a Flote-Tech machine by Rhodes College field school participants and teaching assistants. The device is designed to prevent cross-contamination, as long as the sludge is pumped out of the machine, which we did before floating a new sample. The machine was also cleaned and emptied daily after we had finished processing soil samples for the day. Through this process, soils are removed from the samples, and the samples are separated into light and heavy fractions.

The light fraction includes the remains that are light enough to float to the top of the water in the machine, which often includes modern botanical material, such as roots and leaves, and light carbonized remains such as seeds. The light fraction was captured using industrial fine mesh with openings of approximately 0.3 mm. The heavy fraction includes materials heavy enough to sink to the bottom of the tray in the machine, which was fitted with a 1-mm mesh. These include artifacts, rocks, and dense carbonized remains such as nutshell. After processing with the Flote-Tech, the light and heavy fraction samples were dried, bagged, and labeled.

I analyzed the heavy and light fractions for macrobotanical remains at the Paleoethnobotany Laboratory at the University of Tennessee under the direction of Dr. Kandace Hollenbach. Each sample was sieved through 2.0 mm, 1.4 mm, and 0.7 mm geological sieves. All materials greater than 2.0 mm were sorted into categories and all non-wood carbonized plant remains were identified to the lowest possible taxonomic level. Materials less than 2.0 mm in size were scanned for seeds and items not present in the 2.0 mm portion. I also pulled acorn shell from the 1.4 mm sieve to account for its more fragile nature relative to hickory nutshell.

Data presentation and interpretation is also an important consideration within paleoethnobotanical research and theory. Because the majority of the samples derive from one site (40FY303) and from general excavation contexts rather than feature contexts, I do not apply quantitative statistical comparisons that would require robust datasets, i.e. those with a larger number of samples or similar volumes. I do use Plant to Wood ratios to evaluate which contexts have the most non-wood plant material in them. I also use boxplots to display the macrobotanical data, as boxplots do not rely on data with normal (bell-curve) distributions; rather, they show the distribution of the data by highlighting the median, quartiles, mean, and outliers. This is particularly useful for visualizing plant data, as there are a variety of different factors that determine how much plant matter will be present in a given sample, such as feature type, volume of the sample taken, and preservation.

Stable Isotope Analysis and Its Applications to Paleoethnobotany

People use plant management strategies to increase fruit and seed production, reduce pests, and select for desired traits. Archaeologists study crop management practices such as fertilization and irrigation by utilizing stable isotope analysis (Bogaard et al. 2013; Hastorf and DeNiro 1984).

Stable isotope analysis can be used to differentiate between C3 and C4 plants (Simon et al. 2021). Because C3 and C4 plants use different pathways to conduct photosynthesis, they have different ranges for their $\delta^{13}C$ values. C4 plants have higher

$\delta^{13}C$ values than C3 plants because C4 plants have adaptations that allow them to photosynthesize more efficiently (Cerling et al. 1997). Because of these adaptations, they metabolize the majority of the ^{13}C from the carbon dioxide (CO_2) that they take in, thus resulting in higher values. C3 plants are subject to photorespiration, which releases CO_2 and prevents them from taking up as much ^{13}C. $\delta^{13}C$ values of C3 plants range from -24.4‰ to -29‰, while $\delta^{13}C$ values of C4 plants range from -10 ‰ to -14‰ (Cerling et al. 1997). The average $\delta^{13}C$ value of C3 plants is -26.7 ∓ 2.3‰, while the average $\delta^{13}C$ value of C4 plants is -12.5 ∓ 1.1‰ (Cerling et al. 1997). C3 plants have a broader range of $\delta^{13}C$ values than C4 plants due to their physiological responses to aridity, low light levels, and leaf litter (Kohn 2010). Archaeologists can use $\delta^{13}C$ values to determine if plants were irrigated or not, as irrigated plants have more negative $\delta^{13}C$ values than plants that experienced water stress, or those that were dependent on rainfall (Ehleringer et al. 1993; Marston and Vaiglova 2023.

The atmosphere is mostly comprised of nitrogen, but it has limited biological availability as N_2. Plants need nitrogen to facilitate processes like photosynthesis. Plants prefer nitrogen in ammonium (NH_4+) and Nitrate (NO_3-), and they will also take organic nitrogen sometimes as well. The nitrogen cycle helps us understand how plants uptake nitrogen from their roots and convert it to usable forms within their tissues. During nitrogen assimilation and metabolism, plants undergo a process called fractionation, where they discriminate against ^{15}N, because its bonds are heavier. Fractionation during the mineralization, nitrification, and assimilation processes causes plants to have lower $\delta^{15}N$ values than soil. The $\delta^{15}N$ values of unfertilized plants range from -8‰ to +2‰, but these values can be much higher when fertilization practices are implemented (Commisso and Nelson 2006).

Many archaeologists have applied stable isotope analysis to the study of plant remains to evaluate the presence of plant management processes (Bogaard 2004; Bogaard et al. 2013; Styring et al. 2017). Bogaard et al. (2013) conducted stable isotope analysis on different types of cereal grains and pulses. They found that Neolithic European farmers used manure to fertilize their crops in addition to employing a water management system for irrigation purposes. Stable carbon isotope ratios ($\delta^{13}C$ values) of C3 plants (trees, shrubs, and cold-season crops like wheat, rye, and barley) are greatly affected by the amount of water the plant receives, so stable isotope analysis can be used to identify irrigation practices (Bogaard et al. 2013). Stable nitrogen isotope ratios ($\delta^{15}N$ values) are affected by fertilizer inputs, with greater inputs raising plant $\delta^{15}N$ values.

Styring et al. (2017) also implemented stable isotope analysis of cereal grains to better understand large-scale agricultural production in early Mesopotamia. Their research demonstrated that plant management practices, namely fertilization and irrigation, had a large impact on the economy, and the elites of this society benefited from this more than others (Styring et al. 2017). To date, stable isotope analysis of plant remains has rarely been implemented in historic contexts, but applying this method to historic sites will help us learn more about the techniques that people used to secure their food resources.

Stable Isotope Methodology

To investigate whether enslaved people used manure to fertilize the plants they cultivated for their own subsistence, I conducted stable isotope analysis of 90 samples. Organic fertilizers, like manure, guano, wood ash, and urea, would have been readily available in a plantation setting. Manure, guano, and urea are waste products from animal digestion, while wood ash was a common byproduct of cooking, heating, and/or smoking meat (Covey and Eisnach 2009). Evidence of fertilization would indicate that enslaved populations implemented farm management strategies to encourage the growth of their plants. At Fanny Dickins's plantation, there is evidence of livestock, such as hogs, pigs, cattle, and chickens, raised on the plantation and at enslaved domestic spaces, so people enslaved at Fanny Dickins plantation would have had access to manure (Fayette County Census 1850; Kasper et al. 2022; Kasper et al. 2024). Wood ash associated with foodways-related activities was also present. Thus, it is possible that they manured the plants that they were cultivating for themselves.

Once I analyzed the macrobotanical samples, I selected 90 sets of specimens for carbon and nitrogen stable isotope analysis. Of these specimens, 22 were from wild plant resources, such as nutshell, wood, and weedy plants. Sixty specimens are seeds, cucurbit rind, tuber fragments, and grains from plants that enslaved people cultivated or collected for their own use. Additionally, I analyzed eight specimens from commercial plants that were cultivated on the plantation, such as cotton. These specimens from non-crop taxa will serve as a baseline for the expected $\delta^{15}N$ and $\delta^{13}C$ values for non-fertilized soils in this area. Eighty-one specimens were from Fanny Dickins EAAA House III (40FY303), six samples were from Cedar Grove (40FY325), and three were from Widow Dickins (40FY462). While this analysis primarily focuses on the Fanny Dickins EAAA House III site, samples from Cedar Grove and Widow Dickins were included to determine if there was any significant variance between $\delta^{15}N$ and $\delta^{13}C$ values across the Ames Plantation landscape. Of the 79 samples from Fanny Dickins EAAA House III, only one was taken from a test unit that fell outside of the boundaries of the house structure. Additional provenience information for the isotope specimens can be found in the attachment to this document, named "Isotope Specimen Provenience Information.xlsx".

Each sample was counted, weighed, and photographed before destructive analysis. Between 3 and 4 mg of material is required for analysis, which, for reference, is equivalent to the weight of approximately 1-2 grains of carbonized wheat. Weight was a significant limiting factor for isotopic analysis, as many seed fragments weighed less than 3 mg. In addition, I used Fourier-transform infrared spectrometry (FTIR) to determine if there was any carbonate, nitrate, or humic acid contamination of the botanical materials (Reed and Wallace 2024). Contamination would require that samples undergo a pretreatment process that could destroy from 30% to 60% of the sample (Vaiglova et al. 2014). I used wood from 20 different contexts as a proxy for the sites, as FTIR requires that the samples be crushed.

The results of the FTIR analysis indicated that there was no contamination. **Figure 5.1** shows the spectra for each FTIR sample and demonstrates where peaks would be present if there were contamination. Thus, I did not need to pretreat the samples in 0.5 M HCl for 30 min at 80°C and rinse each three times with ultra-pure water (Vaiglova et al. 2014). I prepared the samples for analysis by placing them in tin capsules and weighing them on a microbalance. The samples were then analyzed using a Gas Chromatography/Mass Spectrometry instrument at the UT Knoxville Stable Isotopes Laboratory under the direction of the Lab Manager, Dr. Anthony Faiia. ^{13}C / ^{12}C ratios were calculated as $\delta^{13}C$ values using the Vienna Peedee Belemnite (VPDB) scale, while the ^{15}N / ^{14}N ratios were calculated as $\delta^{15}N$ using atmospheric N_2. Both were calculated using in-lab standards.

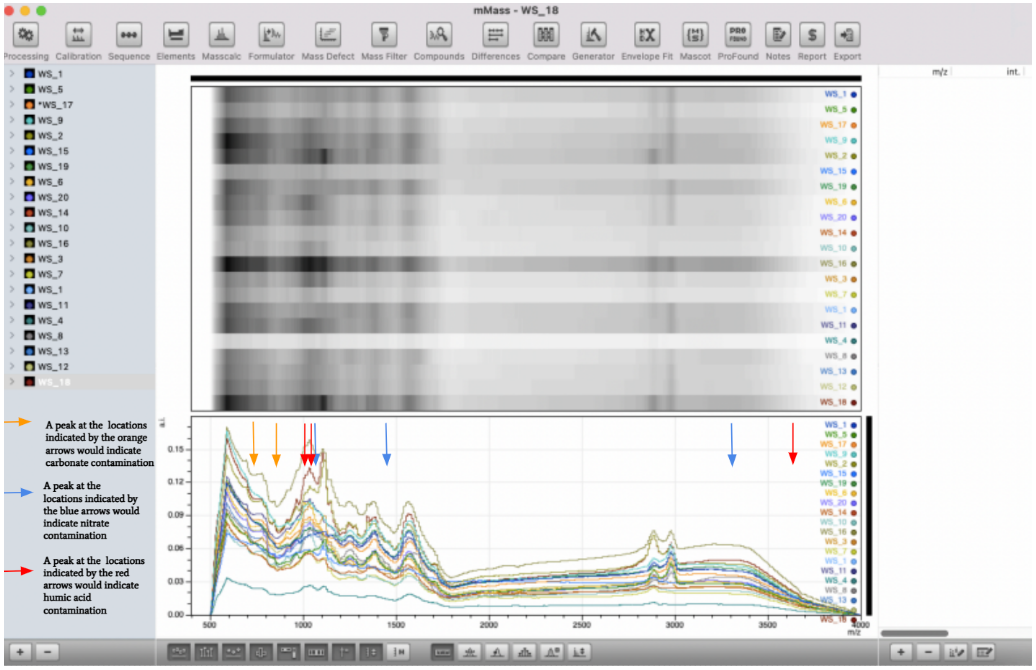

Figure 5.1 Results from FTIR analysis of wood specimens.

CHAPTER SIX: RESULTS FROM MACROBOTANICAL ANALYSIS

The plant remains recovered via macrobotanical analysis from Fanny Dickins EAAA House III (40FY303) and Cedar Grove (40FY325) indicate that the enslaved Africans and African Americans interacted with a variety of cultivated and wild plants for food and medicinal purposes. While Fanny Dickins EAAA House III is the focus of this analysis, the macroplant remains from Cedar Grove and the Widow Dickins manor house help us understand the prevalence of these and other plants on the local landscape, now known as Ames Plantation. Enslaved people at Fanny Dickins relied on plants that were provisioned, produced, and procured to meet their needs, as shown in **Table 6.1**. Detailed data from the three sites are listed as attachments to this thesis.

Table 6.1 notes how enslaved people would have accessed these plants, whether that be through production, provisioning, or procurement. Production refers to all plants that enslaved people cultivated themselves, provisioning refers to those plants that enslavers provided for those whom they enslaved, and procurement refers to plants that enslaved people sourced from wild stands, or even those that they took from the plantation, like cotton. Some plants were accessed in multiple types of ways. Grains, for instance, have been well-documented as both a provisioned and produced foodstuff (Covey 2007; Greer 2025). Flowers in the Aster family, like sunflowers, grow in gardens and in the wild. Some materials do not fall into categories at all. Insect gall, for example, is frequently recovered in macrobotanical analysis, but it is not used to meet any food or medicinal need.

Table 6.1 Results from Macrobotanical Analysis from Fanny Dickins EAAA House III (40FY303).

Common Name	Sum of Count	Sum Of Weight	Provisioned	Produced	Procured
Acorn	38	0.05			x
Acorn cf.	1	0			x
Acorn meat cf.	1	0			x
Aster family cf.	1	0		x	x
Bark	2	0.01			x
Bedstraw	14	0.02			x
Bedstraw cf.	10	0.01			x
Black walnut	1	0.01			x
Blackberry/raspberry	6	0		x	x
Bubbly/Gall	10	0.05			
Bud	37	0.04			
Bud cf.	1	0.01			
Bur cf.	5	0			
Burned food	9	0.8			
Cheno/am	4	0			x
Cherry cf.	2	0.01			x
Cockle bur cf.	1	0			x
Corn cupule	6	0.02	x	x	
Corn cupule cf.	2	0	x	x	
Corn kernel	2	0	x	x	
Corn kernel cf.	3	0.01	x	x	
Cotton	0	0.05			x
Cotton burr	24	3.36			x
Cotton cf.	1	0.01			x
Cucurbit rind	5	0.01		x	
Cucurbit rind cf.	3	0		x	
Fungi	1	0			x
Gall	156	0.55			
Gall cf.	4	0			
Grain cf.	12	0.02		x	x
Grape cf.	3	0			x

Table 6.1 continued

Hazelnut	1	0			x
Hazelnut cf.	1	0.01			x
Hickory	12	0.09			x
Hickory hull	1	0.01			x
Hickory husk	1	0			x
Knotweed cf.	1	0			x
Maygrass cf.	1	0			x
Millet cf.	1	0		x	
Monocot Node	2	0.01			
Nutshell	9	0.03			x
Nutshell cf.	5	0.01			x
Oat	2	0.01		x	x
Oat/Barley	11	0.03		x	x
Eurasian Grain*	18	0.06		x	x
Peach	20	0.4		x	x
Peach cf.	1	0.01		x	x
Peach/Hickory	4	0.03		x	X
Peach/Nutshell	20	0.40		x	X
Peach/Walnut	1	0.01		x	X
Peach/Walnut cf.	1	0.01		x	X
Pecan cf.	1	0		x	X
Persimmon seed coat	1	0			X
Persimmon seedcoat cf.	1	0			x
Pine cone	3	0.01			X
Pine cone/bark	1	0			X
Pine needle	1	0			X
Pitch	100	0.40			
Pitch/Burnt food	22	0.18			
Pokeweed	8	0.01			X
Purslane	1	0			X
Raspberry (uncarbonized)	9	0		x	x

Table 6.1 continued

Receptacle	1	0			
Receptacle/cap	2	0			
Rye cf.	2	0.01		x	x
Smartweed	1	0			x
Smartweed cf.	3	0			x
Spore clump	4	0.01			
Stem	6	0.03			
Sumac	3	0			x
Tuber	3	0.05		x	
Tuber cf.	26	0.22		x	
Unidentifiable	150	0.92			
Unidentifiable seed	119	0.14			
Unidentifiable seed coat	1	0			
Walnut family	4	0.02		x	x
Walnut/Peach	1	0		x	x
Wheat	5	0.02	x	x	
Wheat cf.	2	0	x	x	
Worked Wood	1	0.01			

*Cannot be differentiated among wheat, oat, barley, or rye.

Wild Plant Resources

For the purpose of this research, wild plants are defined as plants that enslaved Africans and African Americans would have procured from natural areas surrounding their houses and larger plantation areas. **Table 6.2** lists the wild plant resources identified during macrobotanical analysis and notes when these plants were seasonally available. As shown in **Table 6.2**, enslaved people would have procured fruits and weedy plants when they were seasonally available in the summer, and they would source most nuts in the fall. Wood is a ubiquitous plant remain within these samples, as enslaved people cooked over fires and used them for warmth and spaces of gathering. They likely sourced this wood from local wooded areas, as a variety of hard- and softwood trees are available on Ames Plantation. These samples are also carbonized, so wood is represented well within these samples.

Nuts also make up a large portion of the wild plant assemblage. Enslaved people collected nuts from trees on the landscape when they were seasonally available (Covey and Eisnach 2009). Nuts were a valuable resource, as they are a good source of protein; trees produce large quantities of nuts regularly; and they can be stored for long-term use (Hilliard 2014). Heartier types of nutshell, like that of hickory and black walnut, may be disproportionately represented when compared to thinner types of nutshell, like acorn or pecan.

Peach pits, cherry pits, and bramble seeds were also recovered. Peaches and cherries were often cultivated in orchards, but there were likely naturalized peach trees in this region of Tennessee that were exploited by the people who were enslaved at this plantation. Nineteenth-century peaches were often dismissed as pig fodder by planters, but enslaved people often consumed peaches themselves and turned them into preserves (Samford 2007; Covey and Eisnach 2009). Peaches also had medicinal uses, as leaves from peach trees could be turned into teas to alleviate fevers, while the peaches themselves could be mashed into poultices to curb inflammation (Covey 2007). Local residents likely foraged for brambles, which include blackberries and raspberries, in highly disturbed areas and margin settings, where these plants thrive. Brambles are likely underrepresented in these samples, as these seeds are rarely carbonized since these fruits are often eaten raw. Wild cherries, and bark from cherry trees, had many documented medicinal uses within enslaved communities (Covey 2007). Wild cherries were mixed with other things, like nail rust, to improve blood, and the bark was used to make teas to treat ailments like coughs or fevers (Covey 2007). Bedstraw, which was a weedy plant that would have been recovered from disturbed grassy areas, was also recovered. It is aptly named, as bedstraw was used historically to stuff mattresses (Gucker 2005). These wild plant resources affirm that enslaved people took advantage of plants available to them on the landscape to add to their foodstuffs and well-being.

Cultigens

Several types of grains were recovered from the samples from all of the sites. Works Progress Administration narratives, collected in the 1930s when formerly enslaved people were interviewed about their experiences, document that wheat or rye flour was a foodstuff that was provisioned to enslaved people on special occasions in Virginia and Mississippi; however, flour was not frequently or consistently rationed

(Greer 2025). Additionally, grains from commercially ground flour would not be recovered through macrobotanical analysis, so the grains in this assemblage were likely cultivated in gardens by enslaved people, gathered from wild stands, or grown on other parts of the plantation and brought back to the house site and ground by enslaved people themselves. Enslaved Africans and African Americans may have also cooked these as whole grains, similar to a porridge or pilaf.

Corn, which is also a grain, was consistently present within these macrobotanical assemblages. Similarly to flour rations, cornmeal was also provisioned occasionally, but the corn in these samples is likely not cornmeal, as it would have also been too finely ground to be recovered macrobotanically (Greer 2025). Additionally, only corn kernels were used to make cornmeal, and corn cupules, which are part of the cob, were also recovered here. Enslaved people could have ground grains or corn themselves in hand mills to make their own flour or cornmeal (Covey and Eisnach 2009; Greer 2025). Alternatively, they may have cooked whole corn kernels as hominy (Covey and Eisnach 2009; Hilliard 2014). Cornmeal was also used to make corn bread, which is a food that enslaved Africans and African Americans had strong cultural connections to (Covey and Eisnach 2009; Hilliard 2014). Corn also served medicinal purposes within enslaved communities. Corn meal was mixed with lard, poke, or tallow to create salves to treat bruises or inflammation (Covey 2007).

Cotton was recovered from several samples at the Fanny Dickins EAAA House III site. While cotton could have been tended in gardens by enslaved Africans and African Americans, they likely took it from the fields instead, since they grew cotton as the main cash crop on Fanny Dickins Plantation. Another possibility is that enslaved people grew a crop of cotton for themselves under the direction of their enslaver, as this practice was documented on a plantation in Mississippi (Covey and Eisnach 2009). The majority of the cotton remains recovered were pieces of cotton burr, which is the dry, brittle structure that encloses the cotton boll. It is possible that enslaved people were using the burrs as a fire starter. The primary use of cotton bolls is for fabric, which meets the important need of clothing. It has also been documented that cotton roots were used by enslaved women as a form of birth control (Covey 2007).

Hilliard (2014) noted that enslavers provided those they enslaved with vegetables, as they are less costly than meat, but enslaved people often grew vegetables in their gardens, which allowed them to have more variety in their diets. Enslaved people frequently grew squashes and tubers, which are starchy storage organs found on roots, such as sweet potatoes, in their gardens. Beans were also recovered, and they have been documented as both garden crops and provisioned resources (Greer 2025). The presence of multiple cultigens illustrates that people actively managed the landscape in many ways to grow numerous types of crops.

Spatial Discussion of Macroplant Remains at Fanny Dickins (40FY303)

Sample location is an important consideration when interpreting results from macrobotanical analysis. Using a Plant to Wood ratio allows us to determine which contexts had the highest amount of other plant remains compared to carbonized wood. This ratio also helps standardize this data, given that the flotation samples represent a variety of different volumes. **Table 6.3** shows the plant weight and context for each of the macrobotanical samples that were analyzed from 40FY303. The samples came from a variety of excavation units, and several samples were taken from features. Several samples were located within the house structure at Fanny Dickins EAAA House III, which is shown in **Figure 2.4**. Features included linear stains, pit features, and post molds. After the Plant to Wood ratio was calculated, I used a box and whisker plot, which is shown in **Figure 2.4**, to visualize the results. Samples with total plant weights of less than 0.10 g were excluded from this boxplot to avoid skewing the results.

As shown in **Figure 6.1**, two samples were extreme outliers (shown as circles in the boxplot), as they had a much higher Plant to Wood ratio than the other samples. Sample 224 was from a pit feature in Excavation Unit (EU) 29, and Sample 17 was from a linear stain feature in EU 1. Sample 224 was expected to have a high Plant to Wood ratio as pits were commonly used for food storage. The unit associated with this sample, unit 29, has a moderate distribution of artifacts (Norton et. al 2017). Sample 17 was not necessarily expected to have a high Plant to Wood ratio, as there is nothing specific about the feature type that suggests this context would be predisposed to a higher volume of plant matter; however, this context is located near the middle of the structure and does have a high density of other artifacts, particularly ceramics and personal items (Norton et. al 2017).

Additionally, I considered analyzing the Plant to Wood ratio with consideration of samples that were found within and outside of the house structure. However, of the five samples that were from the exterior of the house, which were located in excavation units (EU) 22, 38, 39, 41, and 43, only three had total plant weights above 0.10 g, preventing me from having a large enough sample to make significant comparisons. That said, the samples found outside of the structure generally had lower Plant to Wood ratios, suggesting that food-related activities mostly occurred within the house structure.

Additionally, I conducted a Grain to Plant ratio of the Fanny Dickins samples to visualize where the grains were concentrated in the sample distribution (**Figure 6.2**), as grains were a significant cultigen resource uncovered at Fanny Dickins SCIII. These were calculated by dividing the count of corn remains and Eurasian grains in each sample by the total plant weight for that sample. Grains were highly concentrated in three samples, which are represented by the outliers on the boxplot (**Figure 6.2**). Samples 18, 111, and 37 were the outliers for this ratio, meaning that they had the highest ratio of grains to plant material of the samples. All three of these samples are located within the house structure, which was expected, as the interior of the house had the highest plant to wood ratios. Excavation Unit (EU) 1, which is the unit that Sample 18 was taken from, has a high density of ceramics, personal items, and architectural artifacts (Norton et al. 2017). Sample 37 was taken from EU 3, which has a low density of ceramics, personal items, and architectural artifacts (Norton et al. 2017). Sample 111 comes from EU18, which has a moderate density of ceramics, personal items, and architectural artifacts (Norton et al. 2017).

Summary of the Plant Resources Documented at Widow Dickins and Cedar Grove

Tables 6.3 and 6.4 show a summary of the macrobotanical remains recovered from Cedar Grove (40FY325) and Widow Dickins (40FY462), respectively.

Additionally, **Table 6.3** indicates how the enslaved Africans and African Americans who lived at these sites would have accessed these plant resources.

While there are not enough samples from Widow Dickins (40FY462) or Cedar Grove (40FY325) to make statistical comparisons about the subsistence patterns of the people who occupied these sites, identifying which plant resources are present at these sites helps us understand how widely available these resources were. Additionally, it helps us to identify plants that were locally available on the landscape that were not found in the assemblage at Fanny Dickins EAAA House III.

Corn, peach, and hickory nutshell were the three plant resources that were documented at all three sites. Corn was an important subsistence crop, a mainstay of all Southern antebellum diets (Hilliard 2014) so its presence at all three sites is expected. Peach and hickory nuts are two other plant resources that people across these plantations consumed.

Bedstraw and tubers were two plant resources that were identified in the Widow Dickins assemblage and Fanny Dickins assemblage, but they were not present in the resources from Cedar Grove. Lack of recovery from Cedar Grove could be related to the small sample size. Eurasian grains were present at both Cedar Grove and Fanny Dickins. Their absence from the Widow Dickins site could again be related to the small sample size but might also indicate that enslaved people were more likely to cook these grains as whole berries (like for porridge or pilaf) while plantation owners might have preferred ground flour (Covey and Eisnach 2009). Ultimately, these plant resources were all important contributors to the diets of those who lived in these plantation spaces.

Notably, the samples from Cedar Grove had plant and animal resources that were not documented in the samples at Fanny Dickins. For example, eggshell was present in the samples at Cedar Grove, indicating that enslaved at this plantation had possible access to chickens. The Cedar Grove samples also contained a daub-like material, which could be indicative of architectural practices that were used to build houses or even ovens within this domestic space.

I also investigated the Plant to Wood ratios across the three sites. There were fewer samples from the Widow Dickins and Cedar Grove sites, so it was not appropriate to display this data in a boxplot. The Cedar Grove samples had a similar Plant to Wood distribution to those from Fanny Dickins. The Widow Dickins samples had a much larger distribution, as one of the samples had a high concentration of plant material.

Table 6.2 Seasonal Availability of Wild Plants Identified at Fanny Dickins EAAA House III (40FY303).

Common Name	Scientific Name	Season of Availability
Pine Cone	*Pinus* sp.	Fall/ Winter
Black Walnut	Juglans nigra	Fall
Hazelnut	*Corylus* sp.	Fall
Hickory	*Carya* sp.	Fall
Pecan	*Carya illinoinensis*	Fall
Persimmon	Diospyros sp.	Fall
Bedstraw	*Galium aparine*	Spring/ Summer
Knotweed	*Polygonum* sp.	Spring/ Summer
Maygrass	*Phalaris* sp.	Spring/ Summer
Purslane	*Portulaca oleracea*	Spring/ Summer
Blackberry	*Rubus* subg.	Summer
Cherry	*Prunus* sp.	Summer
Goosegrass	*Eleusine* sp.	Summer
Grape	*Vitis* sp.	Summer
Raspberry	*Rubus idaeus*	Summer
Acorn	*Quercus* sp.	Summer/ Fall
Pokeweed	*Phytolacca americana*	Summer/ Fall
Smartweed	*Persicaria* sp.	Summer/ Fall
Sumac	*Rhus* sp.	Summer/ Fall
Wood	various	Year-round
Fungi	*Fungi*	Various

Figure 6.1 Plant to Wood Ratio, Fanny Dickens EAAA House 3 Site (40FY303), Mean represented by "x", Outliers represented by circles, and median represented by the line in the box.

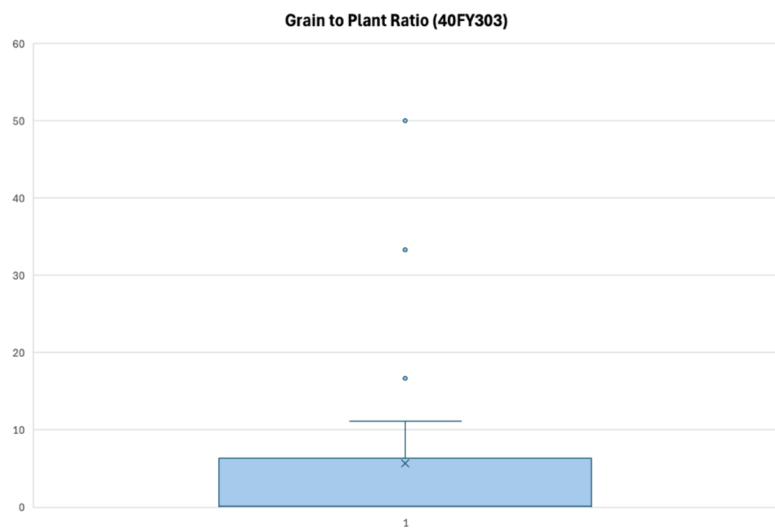

Figure 6.2 Grain to Plant Ratio, Fanny Dickens EAAA House 3 Site (40FY303), Mean represented by "x", Outliers represented by circles, and median represented by the line in the box.

Table 6.3 Results from Macrobotanical Analysis from Cedar Grove (40FY325).

Common Name	Sum Of Count	Sum Of Weight	Provisioned	Produced	Procured
Acorn	1	0.00			x
Aster family cf.	2	0.00		x	x
Barley/Oat	1	0.00			
Bean cf.	5	0.01		x	
Chaff cf.	9	0.02			
Cherry cf.	1	0.00			x
Coal/pitch	6	0.01			
Corn cupule	5	0.04	x	x	
Corn cupule cf.	7	0.03	x	x	
Corn embryo	1	0.00	x	x	
Corn glume	3	0.00	x	x	
Corn kernel	8	0.03	x	x	
Corn kernel cf.	5	0.01	x	x	
Eggshell	12	0.03			
Fruit cf.	2	0.02		x	x
Gall	1	0.00			
Grain	3	0.00			
Grain cf.	5	0.03	x	x	
Hickory	21	0.14			x
Monocot stem	5	0.00			
Nutshell cf.	11	0.16			x
Eurasian Grain*	1	0.00		x	x
Peach cf.	1	0.01		x	x

Table 6.3 continued

Table 6.3 continued.

Peach/Walnut	4	0.04	x	x
Pitch	49	0.72		
Receptacle cf.	1	0.01		
Stem	6	0.03		
Unidentifiable	6	0.20		
Unidentifiable seed	11	0.05		

*Cannot be differentiated among wheat, oat, barley, or rye.

Table 6.4 Results from Macrobotanical Analysis from Widow Dickins (40FY462).

Common Name	Sum Of Count	Sum Of Weight
Bedstraw cf.	2	0.01
Bud	4	0.00
Burned food	1	0.00
Corn cupule	1	0.00
Gall	3	0.00
Grass family	2	0.00
Hickory	22	0.39
Nutshell	1	0.01
Peach	1	0.01
Peach/Nutshell	2	0.01
Persimmon cf.	1	0.00
Pitch	4	0.02
Spore clump	1	0.00
Stem	1	0.00
Tuber cf.	1	0.01
Unidentifiable	27	0.01
Unidentifiable seed	10	0.00
Walnut/Peach	1	0.01

CHAPTER SEVEN: RESULTS FROM STABLE ISOTOPE ANALYSIS

Overview of Results

While the macrobotanical remains give a picture of the variety of plant resources utilized through production, procurement, and provisioned on the plantation sites, the isotope analysis proved useful in identifying fertilization practices based on nitrogen values. Variation in carbon values also hints at environmental conditions, such as drought. Thus, stable isotope analysis has the ability to give us insight about the production of these plant resources and the environment that they were grown in, which we would not know from macrobotanical analysis alone.

Of the 90 specimens analyzed, 87 produced viable results. Three specimens were excluded as their $\delta^{15}N$ values were off scale, due to the amplification used. The $\delta^{15}N$ and the $\delta^{13}C$ values were adjusted by 0.32‰ and 0.16‰, respectively, to account for the impact that the carbonization process has on these values. Here, I use the adjusted values to make interpretations, unless otherwise specified. **Figure 7.1** shows the adjusted $\delta^{15}N$ and the $\delta^{13}C$ values from 87 of the 90 specimens used in the stable isotope analysis. The attachment to this thesis, titled: “Isotope Specimen Provenience Information.xlsx” provides specimen information, raw $\delta^{15}N$ and $\delta^{13}C$ values, adjusted $\delta^{15}N$ and $\delta^{13}C$ values, and provenience information for each specimen.

Eighty-one specimens were from Fanny Dickins EAAA House III (40FY303). Nine specimens were included from Cedar Grove (40FY325) and Widow Dickins (40FY462) to ensure that there was not significant isotopic variance on the Ames property. Six specimens were taken from Cedar Grove (40FY325) and three from Widow

Dickins (40FY462). The values for these specimens do not serve as outliers to the values of the specimens taken from Fanny Dickins EAAA III.

As anticipated, the $\delta^{13}C$ values clearly distinguish between the C3 and C4 plants that were sampled. The $\delta^{13}C$ values of the C3 plants in this assemblage fall between -19.421‰ and -29.819‰, while the $\delta^{13}C$ values for the C4 plants fall between -9.035‰ and -10.966‰. The average $\delta^{13}C$ value of C3 plants in this assemblage is -25.966‰, while the average $\delta^{13}C$ value of C4 plants is -10.133‰.

Notably, the $\delta^{13}C$ values for C4 plants in this assemblage are quite low; this is indicative of water stress during growth (Cerling et al. 1997). C4 plants are generally more resilient to drought-like conditions, but corn is an exception. It is likely that if other C4 plants were sampled, they would reflect some level of water stress, but it would not be as drastic as the values from the corn.

As shown in **Figure 7.2** shows that among C3 plants, the wild plant resources and cultigens that were sampled both have average $\delta^{13}C$ values, but the values were higher for cultigens than the wild plants, which could indicate some level of water stress, as the cultigens were at the lower end of the average. A possible explanation for this result is that the wild plants grew in or along the margins of forested areas. Plants grown in forested areas are less susceptible to water stress. Water stress in these plants is most likely due to the periodic droughts that West Tennessee experienced in the nineteenth century (Dodds et al. 2009).

The $\delta^{15}N$ values of plants are best evaluated within the context of each plant type, as there is much more potential for variation depending on plant type and intra-plant variation.

Wild Plant Resources

There is an abundance of environmental and anthropogenic factors that cause isotopic variability. Environmental factors include precipitation, temperature, and altitude, while anthropogenic causes include fertilization, swiddening, and tillage (Scarry et al. 2022; Szpak 2014). Due to the convergence of these factors, it is important to establish a baseline of what expected $\delta^{15}N$ values should be for non-fertilized crops in the desired area of investigation. Wild plant resources, which include weeds, trees, and tree products, such as fruit and nuts, are helpful for establishing this baseline. Most wild plants are not actively manured or fertilized; while people use wild plant resources, they do not always cultivate these resources. There are exceptions to this, as people do occasionally manage wild plant resources, such as clearing out competing trees to ensure that desired trees produce more fruit. In addition, wild plants growing in or adjacent to manured fields may be fertilized inadvertently. Including a variety of different types of wild plant resources to establish this baseline ensures that any outliers can be accounted for.

Figure 7.3 shows the δ15N and δ13C values for the wild plant resources that were tested using stable isotope analysis. Botanical material from all three sites were selected as specimens to ensure that the baseline represents the larger Ames landscape. Figure 7.3 also shows the types of plant material that were used. From these data, the baseline for expected δ15N values of unfertilized plant resources falls between -2.31‰ and 3.35‰. δ15N values above the limit of this baseline (3.35‰) indicate the use of fertilization practices. Of the 22 wild plants that were sampled, six specimens were outliers and did not contribute to the establishment of the baseline, and one specimen could not be used as the δ15N was off-scale. Six of the specimens that were outliers were nutshell or peach pit. It is possible that hogs were penned under these trees, and they were producing manure and urea in these pens that fertilized these trees. One weed, which was bedstraw was the remaining outlier. Bedstraw often grows in highly disturbed areas, so it is possible that it was growing near a garden plot and was inadvertently fertilized.

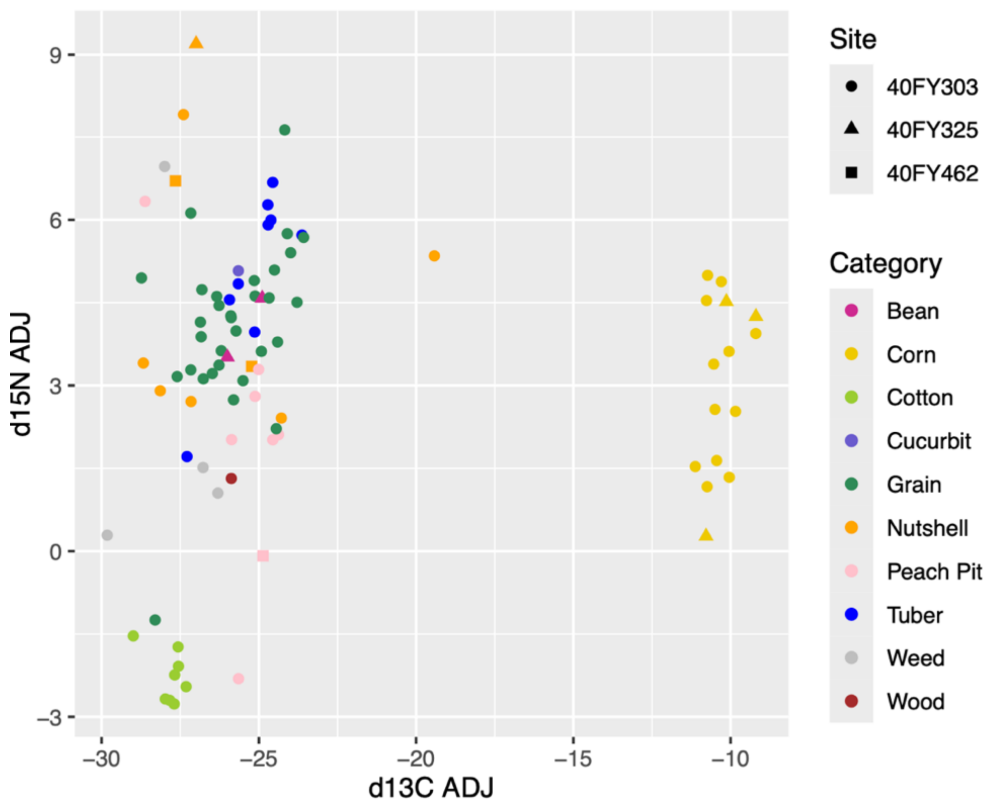

Figure 7.1 Results from stable isotope analysis by site (indicated by shape) and plant category (indicated by color).

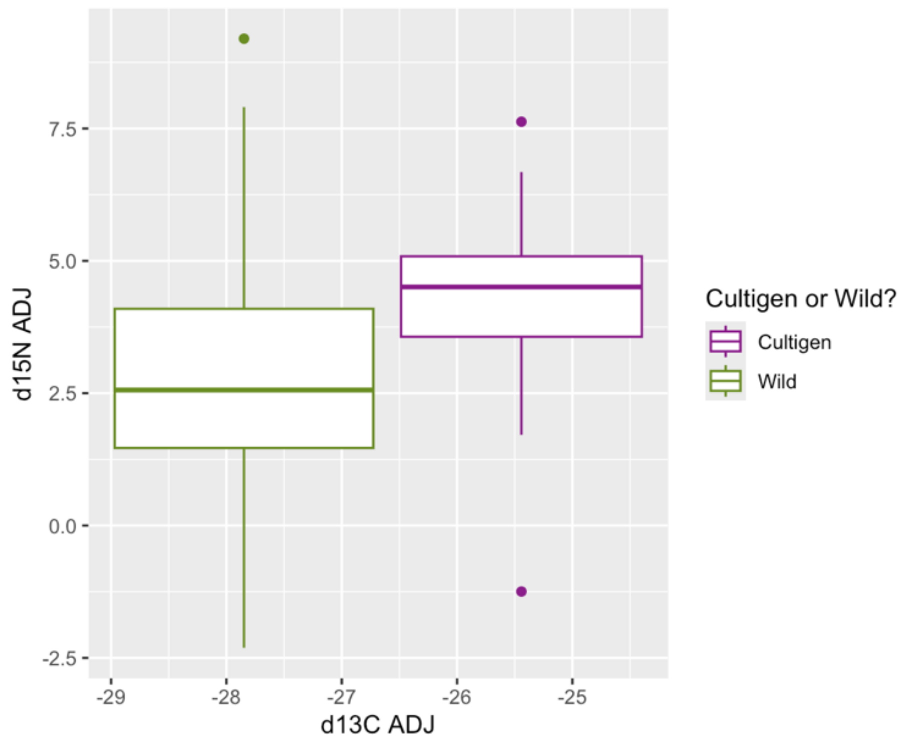

Figure 7.2 Stable isotope analysis results of C3 plants.

Grains

Figure 7.4 shows the $\delta^{15}N$ and $\delta^{13}C$ values for each grain that was evaluated using stable isotope analysis. Specimens were only taken from Fanny Dickins EAAA III, as the grains recovered from the Widow Dickins and Cedar Grove sites did not have enough mass to sample. Through previous investigations of the impact of fertilization on grains, archaeologists have identified that the lower range of $\delta^{15}N$ values affected by manuring is 3‰ and the higher end is 9‰ (Bogaard et al. 2013). With consideration of the regional baseline that I have established using the wild plants as a proxy for environmental response, the lower end of $\delta^{15}N$ for fertilized plants would be 3.35‰. Twenty-eight of the thirty-three grains that were evaluated through this analysis fall within the range for fertilization, three grains fall below this range, and two grains had

$\delta^{15}N$ values that were off scale. This is significant evidence that these grains were fertilized.

To confirm these results, I have compared the $\delta^{15}N$ values of grain in my study to the $\delta^{15}N$ values of other grains in archaeological contexts that were manured (Bogaard et al 2013). The values presented in this thesis generally fall in line with the values of manured grain. However, most stable isotope data of grains in archaeological contexts is from ancient sites in Europe or Asia. Because these geographic and temporal differences, I have selected data from a variety of different geographic contexts to see if there are other variables than fertilization that would impact $\delta^{15}N$ values. While this adjustment is somewhat helpful, it is important that archaeologists continue to conduct stable isotope studies of grains and other plants so that there is more comparative data available.

Corn

Corn was present within the macrobotanical assemblages of Fanny Dickins EAAA House III and Cedar Grove. Corn can help to evaluate the presence of fertilization. Using the range developed for C3 and C4 grains that has been adjusted to account for the baseline identified in this study, a consideration of the values of corn, which is also a grain, can help to evaluate the presence of fertilizer (Bogaard et al. 2013). Thus, the range I employ to evaluate the fertilization in corn and other grains is 3.35‰ to 9‰. **Figure 7.5** shows the $\delta^{15}N$ and $\delta^{13}C$ values for each corn specimen. Eight of the fifteen specimens fall within the range of fertilization, while five specimens fall below this range, and one specimen falls far below the range, which is likely due to a sampling issue. While the majority of these data positively indicate the use of fertilizer in the growth of corn, more data are necessary to certify the use of fertilization practices in corn growth on the Ames property.

Intra-plant variation refers to the differences in traits that exist within parts of the same plant individual. **Figure 7.5** also shows that this variation did not significantly impact the $\delta^{15}N$ values of these samples. There is significant isotopic variability of ^{15}N / ^{14}N ratios found within different structures of plants. Reproductive structures, such as seeds, are nitrogen sinks while other structures, like leaves, do not take up as much nitrogen, so it is important to investigate the role of intra-plant variation when sampling from different parts of the plant. Researchers have observed that there is significant intra-plant variation within different parts of corn that impacts $\delta^{15}N$ values; however, variation has only been investigated in the roots, stems, leaves and grains (Choi et al. 2001). I sampled corn kernels, which are the grains, and corn cupules, which are a part of the corn cob. Additional research is necessary to determine if there is intra-plant variation between corn grain and cobs, but the data presented does not suggest that this is the case.

Cotton

Figure 7.6 shows the $\delta^{15}N$ and $\delta^{13}C$ values for cotton and other C3 cultigens, excluding grains, as they have already been discussed in this analysis. All of the cotton found within the macrobotanical assemblages was either cotton burr, which is a dried modified leaf structure, or part of the cotton boll, which is the white fluffy part that is the fruit of the plant. The cotton boll did not weigh enough to be sampled, so only the cotton burr was sampled for stable isotope analysis. Additionally, all of the cotton sampled is from Fanny Dickins EAAA III, as cotton was not present within the macrobotanical assemblages from the other two sites.

Researchers have observed an inverse relationship between the $\delta^{15}N$ values of cotton leaves and the implementation of fertilizers (Stamatiadis et al. 2006). Thus, lower $\delta^{15}N$ values indicate that fertilization practices were used on cotton, which is evident in these samples. If there were cotton seeds available for sample, they would likely fall in the range of fertilization for grains and corn, as seeds and grains are nitrogen sinks. This is yet another example of how intra-plant variation impacts $\delta^{15}N$ values within plants.

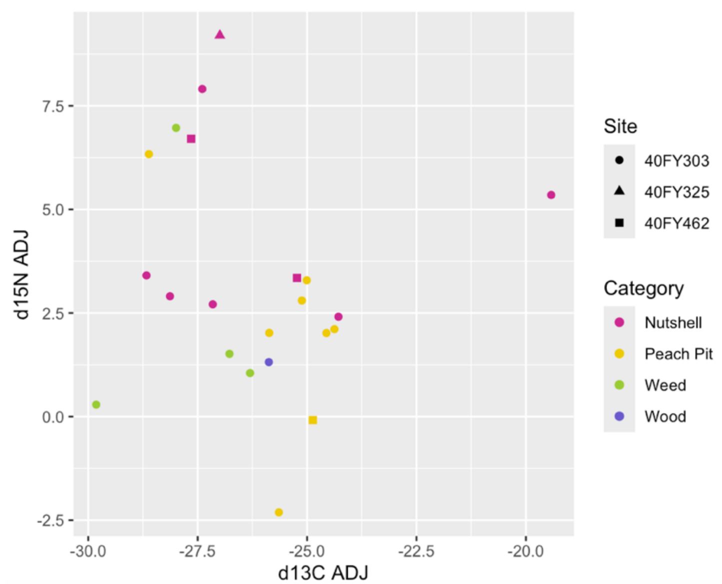

Figure 7.3 $\delta^{15}N$ and $\delta^{13}C$ values of wild plants by site (indicated by shape) and plant category (indicated by color).

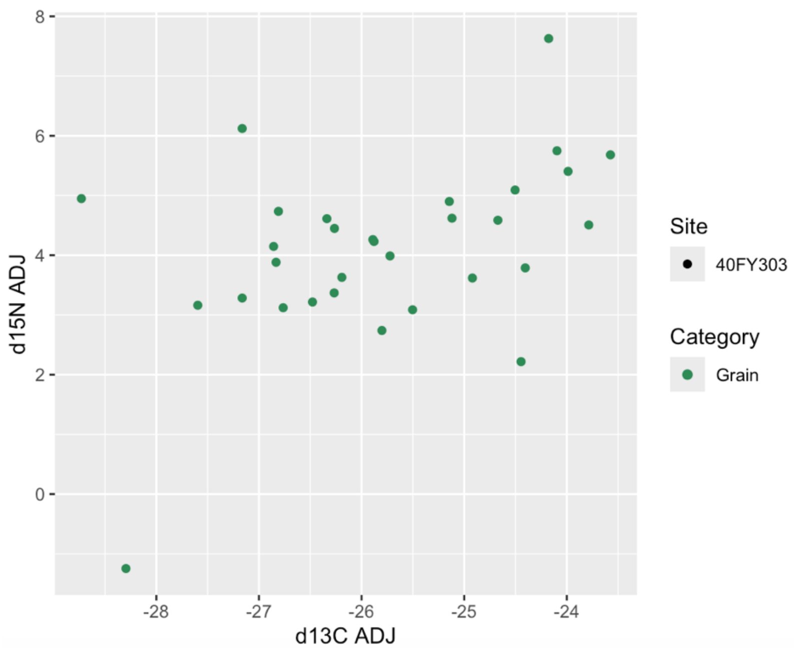

Figure 7.4 $\delta^{15}N$ and $\delta^{13}C$ values of grain by site (indicated by shape) and plant category (indicated by color).

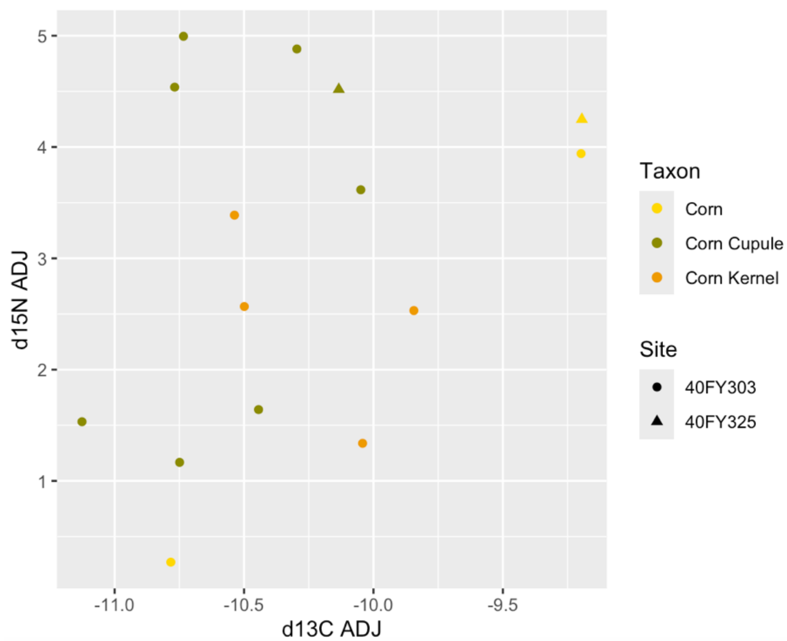

Figure 7.5 $\delta^{15}N$ and $\delta^{13}C$ values of corn by site (indicated by shape) and taxon (indicated by color).

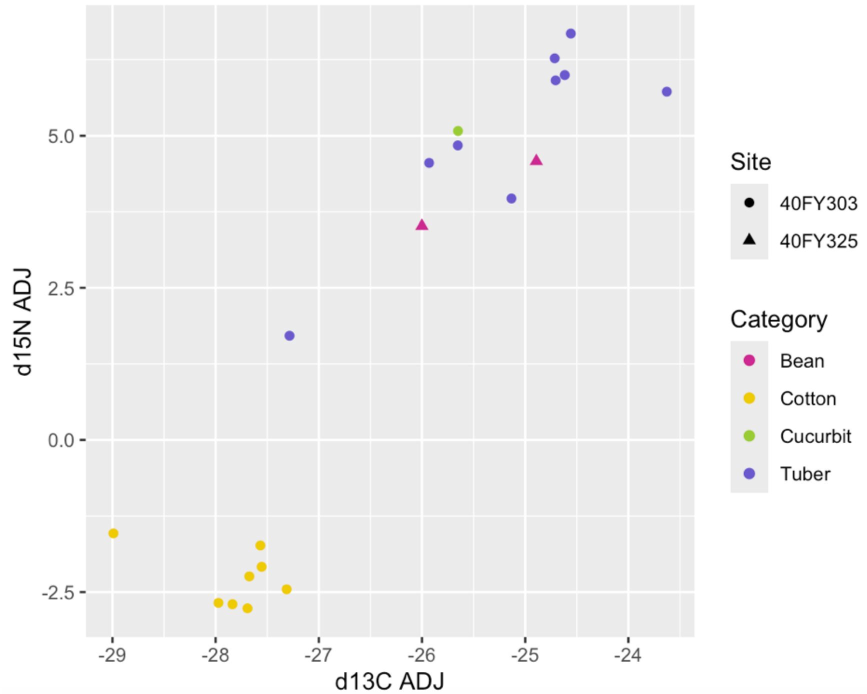

Figure 7.6 δ15N and δ13C values of C3 cultigens, excluding grains, by site (indicated by shape) and plant category (indicated by color).

Other Cultigens

Archaeologists are working to use stable isotope analysis to understand the impacts of plant management process on a wider variety of plants. While cereal grains and corn are fundamentally important crops, there are many other types of crops that significantly contribute to foodways. When sampling tubers, cucurbit rind, and beans, I took into consideration the fact that there would be a lack of available comparative data, but it was necessary to include these plants in this analysis, as these crops were frequently grown in gardens by enslaved people. The $\delta^{15}N$ values of the tubers, cucurbit rind, and beans sampled all fall in the range of fertilization (**Figure 7.6**). Additional stable isotope analysis is critical for understanding more about the fertilization practices for these plants and understanding how values may differ due to intra-plant variation.

CHAPTER EIGHT: CONCLUSIONS AND RECOMMENDATIONS

This research employs multiple proxies to examine enslaved African and African American foodways, primarily at the Fanny Dickins plantation in West Tennessee. The combination of both macrobotanical and stable isotope analyses help us understand some of the practices enslaved people used to ensure that they had food. The results of the macrobotanical analysis demonstrate that the people enslaved at Fanny Dickins plantation interacted with a variety of different plants that contributed to their diets and fulfilled other needs, such as shelter and warmth. Cultigens such as tubers, corn, and grains contributed significantly to the diets of enslaved African and African Americans at the Fanny Dickins plantation (Covey and Eisnach 2009). They also relied on wild plant resources, such as various types of nuts, fruits, and weedy plants, like bedstraw, to meet their needs. The variety of cultigens and wild plant resources affirms that enslaved people used the own-account production time that they did have under the gang labor system to secure non-provisioned resources for themselves and their families. Additional data from the Cedar Grove and Widow Dickins sites contribute to our understanding of the wild plants and crops accessible to the enslaved on this landscape. The presence of cultigens, such as corn, and wild plant resources, such as peach and hickory, at all three sites emphasizes the importance of these plants and affirms that these plants were accessible to multiple groups of people in this area.

Enslaved Africans and African Americans practiced crop cultivation and plant foraging within the restrictions of seasonal availability. They would have harvested nuts from trees in the late fall, when the cotton harvesting season had finished. They also likely planted crops earlier in the spring before they had to begin preparing the cotton fields for planting. Enslaved communities were able to strategically organize their limited time to ensure that their investment into securing these additional food resources would pay out.

While there were not enough samples to quantitatively make comparisons between Fanny Dickins EAAA House III, Cedar Grove EAAA, and Widow Dickins, I did find that boxplots and Plant to Wood ratios were especially useful for spatially contextualizing the samples at Fanny Dickins. This analysis demonstrated that there was a higher prevalence of non-wood plant remains inside of the house structure than outside of the house structure. Additionally, I compared these findings to a spatial analysis conducted by Norton and colleagues (2017) to determine which units had a high concentration of plants and artifacts, indicating high levels of activities.

The stable isotope analysis of plant remains primarily from the Fanny Dickins EAAA House 3 Site indicates that fertilization practices were used for cultigens such as corn and cereal grains. Other cultigens have $\delta^{15}N$ values that fall within the range of fertilization, but additional comparative data are necessary to corroborate these results. This evidence of fertilization greatly contributes to our otherwise limited knowledge of plant management practices that enslaved people employed. Additionally, these data support previous findings that enslaved people approached food and plant use through many specialized practices (Kasper 2020; Kasper et al. 2022). For instance, enslaved people would have had the most time for own-account production to manure their gardens in the summer and winter, when the demands of cotton cultivation were less

(Hong 2001). They also could have strategically manured their garden plots by letting pigs, chickens, or cattle into their gardens. This practice would be more efficient than bringing in manure from elsewhere on the plantation and then spreading it out.

These data emphasize that the food-related actions that enslaved people practiced daily and seasonally were significant experiences both within and outside of this community. Members of enslaved communities were exploited for their labor and had their rights stolen from them by their enslavers, but they still had active roles in shaping society and culture through their practices. While enslaved people were constantly subject to violence and abuse at the hands of their enslavers and the government, their lives were not constrained to the trauma that they experienced. We must recognize the persistence of agency through food-related practices as acts of survival and well-being.

The concept of agency, which is the ability of someone to shape society through their actions, encapsulates a full range of human experiences. While enslaved people practiced agency through tactics of resistance and resilience, I employed agency to understand the significance of the interactions between enslaved people and plants. Food-related practices hold much value within all societies: although everyone must eat to survive, the ways in which people obtain, prepare, and share foods are culturally shaped and simultaneously shape people and cultures. Securing food for yourself and your family is an act of agency built out of many specialized practices, which have significance within our own lives, communities, and cultures. Food resources that were provisioned by enslavers were not enough to sustain the dietary needs of enslaved people, and these resources are especially limited when considering that they likely needed more food to sustain the physical demands of working under the gang labor system. Finding and cultivating other sources of food was partially a practice of necessity, as enslaved people knew that they could not survive on rations alone. This was also a practice deeply informed by traditional knowledge, as enslaved people developed unique cooking practices through collaboration within their community, cultural practices of their ancestors, and resource availability. Plant resources were also a means of securing well-being, as enslaved people also used plants as medicine, fuel, and for comfort.

The plant management practices that enslaved people employed were also likely informed by several sources of knowledge. These practices of fertilization and irrigation were likely informed by traditional knowledge of plants, as enslaved people brought specialized knowledge of plant cultivation with them from Africa and continued to share this knowledge within their community. Additionally, enslaved people learned new plant cultivation methods through interactions with indigenous people who lived on these landscapes. Enslaved people also developed knowledge of agricultural management practices as they were forced to labor in the fields by their enslavers. They likely applied the processes that they used to manage crops on the plantation to manage crops within their own gardens. Likely, enslaved people were using the manure from the livestock that they raised in their own spaces. Practices such as letting chickens roam in their gardens or spreading manure from hogs are two scenarios that explain how enslaved people fertilized these plants. Ultimately, supplementing their diets by producing and acquiring non-provisioned foodstuffs was one way that enslaved people were able to exercise control over their own lives, as evidenced by the many specialized practices they employed to ensure food security (McKee 1999).

Recommendations for Future Studies

Enslaved foodways are highly variable and localized, so additional archaeobotanical data will further illuminate the complex relationships that enslaved communities had with plant resources and the environment. Historical archaeologists must continue to take flotation samples during excavation, so that paleoethnobotanists can conduct additional research of plant remains found on enslaved sites. By learning more about the plants that they interacted with, we can better understand the many practices that enslaved people performed to achieve food security.

There is also a critical need for stable isotope analyses to be conducted on a broader range of plant types. Many plants make up the diets of people today and in the past, so it is important that we have enough data to interpret. Stable isotope analysis must also be applied to historical contexts. While we do have historical documentation of irrigation and fertilization, these agricultural management practices were not universally applied. Isotopic data are our best means for uncovering these practices within existing archaeological assemblages. The addition of soil chemistry, when soil samples are available, can help corroborate the presence of fertilization. By applying this methodology to historic sites, we can gain a better understanding of highly specialized agricultural management practices, and we can better reconstruct past environments. Employing these analyses on antebellum sites is particularly important, as it adds significantly to our understandings of the measures employed by enslaved Africans and African Americans who employed fertilization to ensure food security.

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VITA

Mary Katherine Brown was born in Hendersonville, Tennessee, on January 9, 2001, to parents Mary Louise and Paul Brown. In 2023, she graduated Cum Laude with a B.A. in Anthropology/Sociology and Political Economy from Rhodes College, in Memphis, TN. Mary Katherine entered the graduate program at the University of Tennessee as an M.A. student in the fall of 2023. She plans to continue her study of enslaved foodways and plant management practices as a Ph.D. student at the University of Tennessee, beginning in the Fall of 2025.