The Villa and Agricultural Economy of Late Roman Sicily: An Archaeobotanical Perspective

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Abstract

The purpose of this study is to highlight the important role recovered plant materials can play in helping to create a broader understanding of Sicilian villas as centers for production during the Late Roman period (400-476 CE). The heart of the investigation requires a multivariate approach that compares findings from Gerace with aspects of written and archaeological record and provides in-depth analysis of the production and economic features of Roman villa settlements. Key to the study will be preserved plant remains found on specific villa sites across the Roman world. Hidden in the sediment are clues to Sicily’s ancient past and evidence for its agricultural productivity that was an important part of the Roman world. Helping to uncover this evidence is part of the diverse field of environmental archaeology, the analysis of which unfortunately which has not been carried out at many sites, leaving an incomplete record of important features of the ancient environment.

Keywords:

Roman, Sicily, villa, agriculture, economy, production, archaeology, plants, archaeobotany


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1. Introduction

The island of Sicily was the first overseas province annexed by Roman Republic and it played a critical part in Rome’s rising power and expanding influence in the Mediterranean. Sicily’s fertile soil was well known in the classical world. Greek settlers believed the whole island was consecrated by Ceres, the goddess of grain, harvest and fertility and that she resided there.¹ When the Romans occupied the island its fabled fertility soon inspired many of Rome’s greatest writers. Cato the Elder described Sicily as a “storehouse of provisions . . . the nurse of the Roman people,” while Cicero declared that it taught Rome “how glorious a thing it was to rule over foreign nations.”² Indeed, the Romans rushed to build villas and extensive agricultural estates to better exploit the island’s abundant resources. The villa is one of the most comprehensively examined subjects in the Roman world. However, most studies have focused on the residential aspects of villa life, while largely disregarding the farming and economic structures on the periphery.³ The ancient sources make it clear that Sicily was central to Rome’s agricultural economy, but a limited amount of archaeological evidence exists for the island’s countless undiscovered villa sites.

Somewhat paradoxically, early archaeological studies have been an impediment to crafting a broader understanding of villa production on Sicily. The vast majority of villa excavations have focused primarily on the inside of the estate, rather than the land around it. Early archaeological studies have focused on the living quarters because they tended to reveal prized mosaics, marble statues and other valuable artifacts.⁴ The allure of Roman luxury items has resulted in archaeological research that is not only incomplete, but also inaccurate and skewed in favor of the roman elites. Mosaics can provide important clues about the villa owners,
but they tell us very little about the nature of farming on the villa and its impact on the rural economy of the Sicilian countryside.

Respected historian and archaeologist, John Percival, summarizes the problem perfectly in his book, *The Roman Villa*. He writes that the limited scope of villa research, “produces a narrow, and in many ways distorted picture, not only of what villas were like, but, more important, of the part they played in the economic and social life of a given region.”

Little thought has been given to investigating the production side of Roman villas and even less to the individual characteristics of Sicilian villas. Investments in archaeological research on Sicily that could help shed light on villa’s economic practices are sorely lacking. Despite the island’s importance in Roman history, it has taken a back seat to excavations of villas in Britain, France and the interior Italian peninsula. The incomplete archaeological record has limited an understanding of Roman villas on Sicily, their economic function and role as production centers during the Roman imperial period.

The purpose of this study is to highlight the important role recovered plant materials can play in helping to create a broader understanding of Sicilian villas as centers for production during the Late Roman period (400-476 CE). The heart of the investigation requires a multivariate approach that compares findings from Gerace with aspects of written and archaeological record and provides in-depth analysis of the production and economic features of Roman villa settlements. Key to the study will be preserved plant remains found on specific villa sites across the Roman world. Hidden in the sediment are clues to Sicily’s ancient past and evidence for its agricultural productivity that was an important part of the Roman world. Helping to uncover this evidence is part of the diverse field of environmental archaeology, the analysis of
which unfortunately has not been carried out at many sites, leaving an incomplete record of important features of the ancient environment.

The study of plants preserved in the archaeological record provide the opportunity to reconstruct the agrarian landscape of Sicily and reveal new insights into the villa economy. An examination of both plant macro remains, and pollen have the ability to shed light on the relationship between Sicilian farming practices and Rome’s greater agro-pastoral system. These forms of archaeobotanical evidence can offer rare insight into economic life not just in villas, but the Roman world in general. Archaeobotanical data aids researchers in gaining a better understanding of the subsistence economy that existed in Late Roman Sicily by studying sites such as villa del Casale, Kaukauna and Gerace. Central to addressing the role Sicily played in the greater Roman agricultural economy will be material recovered from the Villa at Gerace on Sicily. Evidence acquired through the recovery of plant material from Gerace will be important to uncovering and understanding the various aspects of the villa’s agricultural economy on Sicily.

This project, in conjunction with comparative archaeobotanical studies, will help to create a more holistic understanding of the villa’s agricultural economy on Sicily and its role during the latter years of the Roman Empire. The knowledge gained from this research may provide direction for how future studies should proceed on Sicily itself. Likewise, archaeobotanical evidence is important not just for understanding economic life in Roman villas but also Roman life in general. Sifting through sediment samples to recover ancient plant remains may seem like a tedious task, but it is an invaluable method for archaeologists to understand the finer details of Roman culture and society; such as what foods they grew and
why. Villas were the homes of the rich and powerful but with the help of archaeobotany we can also learn more about daily life in Roman villas.

1.1: The Roman Villa at Gerace

From 2013-2018, archaeological excavations have been conducted at Gerace, in the province of Enna on Sicily, Italy. The Roman villa at Gerace was built no later than the end of the late fourth century (370-375 CE) and was likely built for a horse owner named Philippianus. As an example of some of the features uncovered so far at Gerace, a bathhouse was discovered during the 2017 season and continued to be excavated in 2018. Evidence suggests the bathhouse stopped working after it was damaged during an earthquake in 450 CE. Efforts to fix it started soon after, but they were abandoned, and the bathhouse was looted and filled in sometime between 470-500 CE. During this period the Roman Empire had effectively collapsed, and that chaos from Rome’s demise reached every part of the Empire, including Sicily. Excavations of Gerace continue to reveal a plethora of insights into the function and operations of villas on Sicily during the latter years of the Roman Empire.
Archaeobotanical material has been recovered during all six excavation seasons but only a preliminary examination of the material has been done. Findings suggest that Gerace’s farms produced important economic and subsistence crops in the region. Remains of various cereal grains like wheat and barley, as well as a variety of legumes and fruit remains have been recovered. They are typically preserved through the process of carbonization, where organic material is carbonized by exposure to fire, allowing plant parts to preserve over long periods of time. Carbonized plant material can provide archaeologists with valuable information about past agricultural practices and how ancient peoples interacted with the environment. Plant remains recovered from the villa at Gerace can shed light on the nature of villa farming practices on Sicily during the latter part of the Roman Empire. However, it can sometimes be difficult to know which plants were grown locally and which were imported. The fact that the land
surrounding Gerace continues to be cultivated today suggests that it may very well have been the same in the past.

1.2: Defining the Roman Villa

What exactly defines a Roman villa is a difficult question that historians and archaeologists continue to debate. Part of the problem is the lack of surviving literary sources from the period. The sources that historians and archaeologists have to draw from are limited. The ones that describe villas often present contrasting interpretation. Varro’s work, *On Agriculture*, points out that debate over defining a villa was a lively topic of conversation among the Romans themselves. Nevertheless, the ancient sources do provide enough evidence to form some general, albeit incomplete, conclusions about the characteristics of the Roman villa.

Scholars have attempted to rectify the absence of a clear definition by classifying Roman villas into certain types based on their geographical location. The three most common classification types are; the *villa maritima*, a coastal luxury estate, the *villa suburbana*, a countryside retreat with some economic function, and the *villa rustica*, a rural estate with agricultural and other economic functions. Unfortunately, these labels carry some inherent problems that do more harm than good. Using a classification system to help determine the purpose and function of each Roman villa can undermine future research by incentivizing broad generalizations instead of an objective analysis of the unique qualities that each villa estate possess. The use of labels for identifying Roman villas is likely due to the continuing disagreement over their very definition and it has the unfortunate secondary side effect of creating more confusion by trying to define them. However, there is enough archaeological and historical evidence to conclude that the villa was an important, if not essential, part of the Roman Empire.
At its most fundamental level the villa was a home, usually a large estate, purposely built away from urban areas by the wealthy and elite of Roman society. No one knows when the first Roman villa was built but references to them are commonly found in the written sources beginning during the latter half of the Republican Era (509-27 BCE). It is likely not by chance that villa begins to increasingly appear in the written record during this period because it also coincides with the start of Rome’s territorial expansion outside of the Italic peninsula. As Rome expanded outward, the villa developed into an instrumental part of control, economic growth, and Romanization in newly acquired territories. This process accelerated at the birth of the Roman Empire after the accession of Augustus and intensified during the Pax Roman (27 BCE – 14 CE). During this time, the villa became a functional symbol of Rome’s wealth, power and dominance in the ancient world.

Arguably one of the most important features of the Roman villa was its farms. Villa in Latin means “farm” and Roman writers used it regularly when referring to farming. Agriculture was a vital component of most villa settlements. Some used their crops for local subsistence while others farmed for economic benefits. Estate owners were incentivized to grow their own crops to feed themselves and their workers on site, so they did not have to depend on trade from across vast distances of the Empire. Archaeologists have been analyzing the remains of botanical material from Roman villa sites to learn more about their significance. Villas were not just an important feature in the immediate vicinity of Rome, they are found throughout the Empire.

The villa’s basic framework survived relatively unchanged for thousands of years. It is likely that a peasant slave working on a Roman villa in 100 BCE, would find more similarities than differences if transported to an English manor in 1000 CE. Even the plantation systems
utilized by Europeans and Americans during the eighteenth and nineteenth century were modeled after the Roman system.\textsuperscript{15} Although few other Roman architectural wonders can claim to have affected the course of human history like the villa, only recently has research begun to truly uncover their significance on the island of Sicily.

1.3: Goal of Research

The goal of this research is to gain a more holistic understanding of the role of the Roman villa through a multidisciplinary perspective that utilizes archaeological remains, archaeobotany, and literary sources. It investigates the individual characteristics of Sicily’s largely overlooked rural economy and its impact on ancient Rome’s greater agricultural economy, and explores the evidence that supports these goals to examine and analyze the central features of the villa economy on Sicily during the late Roman Imperial period. Central to answering these questions will be archaeobotanical material recovered from the Roman villa at Gerace over the 2017-18 seasons. Analysis of the botanical remains found at Gerace should reflect the nature of agricultural production on the villa, provide insight into its economic role, and help to determine its contributions to Sicily’s greater rural economy during Roman occupation.

To address these research goals, I have implemented a multivariate approach consisting of qualitative and quantitative research involving the analysis of archaeobotanical remains found at Gerace, as well as both ancient and modern written sources related to the villa economy. Archaeobotanical data provides evidence of the general agro-economic structure of Roman villas on Sicily and reflect the various economic crops commonly cultivated on villa sites in the ancient world. Evidence for the nature of villa agriculture from ancient sources including Strabo (\textit{Geography}), Pliny (\textit{Historia Naturalis}) Diodorus (\textit{Library}) Cato (\textit{De Agricultura}), Cicero (\textit{Against Verres}), Varro (\textit{De Re Rustica}) and Columella (\textit{De Re Rustica, De Arboribus})
information regarding the types of crops used in Roman agriculture on Sicily, the structure of the villa, and its production methods on the island of Sicily. Additionally, modern literature and archaeological research will be used to reinforce the findings from the ancient sources.

2 Background
2.1: Historical Overview of Roman Sicily

The island of Sicily holds a unique and important place in the history of the Roman Republic. It was the site of pivotal battles during the Punic Wars that truly tested and proved Rome’s military prowess for the first time against a formidable power in the Mediterranean. In 241 BCE, after Carthage’s defeat in the First Punic War, most of Sicily was annexed by Rome. The rest of the island was absorbed into the province soon after the death of King Hieron II in 215 BCE, leaving it firmly under Roman control. Rome’s acquisition of Sicily marked a significant turning point for the Roman Republic. As its first overseas territory, it symbolized Rome’s growing power in the Mediterranean and first step towards empire. The island provided early lessons in provincial administration, inspiring Cicero to declare that it was where Rome learned “how glorious a thing it was to rule over foreign nations.” However, Sicily provided Rome with much more than prestige and an education.

By the final two centuries of the Republic, Sicily had become the principal granary for Rome. Its fertile soil and bountiful harvests filled the bellies of Rome’s citizens. Strabo even described the island as a “storehouse” because everything Sicily produces is brought to Rome. The fertility of Sicilian soil and the profitability of agriculture made the island a lucrative investment opportunity. Sicily’s farms were not just filling the bellies of Rome, they were filling their wallets too. Roman economic policies had made owning land a lucrative investment opportunity. Therefore, demand for wheat grew and securing a steady supply of it to Rome was
an uppermost priority for the Roman Empire. The solution to this problem was Sicily and the island provided a much-needed source of grain for Rome’s growing population and the Roman elite with a new source of wealth. Indeed, the classical sources largely agree that Sicily played a prominent role in feeding the Republic, but they do little to explain farming operations or the people that made it possible.

Some evidence suggests that large slave estates called *latifundia* were an integral part of the agricultural economy on Roman Sicily. Historian R. T. Pritchard writes that by the first century CE, *latifundia* had become “the characteristic feature of the Roman agricultural scene and they were found not only in Italy but in the provinces as well.”19 It is likely true that *latifundia* dominated the Sicilian countryside at this time, especially when considering the island was the site of two famous slave revolts in the second and first century BCE. In his book, *Sicily Under the Roman Empire*, Roger Wilson points out that the nature of Sicily’s countryside during the final centuries of the Republic remains a topic of intense scholarly debate and suggests that conflicting information found in the writings of Cicero and Diodorus have only fueled speculation.20 He writes that the Cicero camp believes Sicily had a “dispersed pattern of settlement based on small-proprietor ownership of land, while the Diodorus side maintains that small-scale farmers were pushed out by slave-run estates.”21 The exact settlement pattern remains a mystery, but it is hard to imagine that small-scale Sicilian landowners were completely removed from the island’s economic structure and replaced by wealthy Romans landholders with slave estates. Pritchard emphasizes that “the evidence of Diodorus, however, suggests that *latifundia*, devoted to cattle and sheep breeding, characterized Sicilian agriculture down to the First Servile War (135 B.C.)” but as time went on, “the *latifundia* were progressively broken up into smaller estates devoted to corn growing.”22 It is more than likely that the rural landscape of
Sicily reflected a mixture of agricultural settlements that utilized a diverse range of production methods. However, the diverging accounts of Cicero and Diodorus do hint at the lasting impact Rome had on the structure of Sicily’s rural society and most importantly, its agricultural economy.

The information we have on the Sicilian countryside during the Roman Imperial period is even more limited than the Republican period. By 27 BCE, Augustus had formally retained all power in Rome, signaling the downfall of the Republic and the birth of Empire. He began by implementing significant changes to the Roman administrative structure at home and in territories abroad. The sources suggest that on Sicily, Augustus implemented mass reforms to the island’s government and economic structure, designating specific cities as Roman *coloniae* [colony] and prioritizing the settlement of veterans who fought for him during the civil war.\(^{23}\)

Although limited, the sources do provide a small window into the administrative changes that were happening on Sicily.

The rise of the Augustan administration also signaled a shift in Sicily’s agricultural output. Historians M. I. Finley, Denis Mack Smith and Christopher Duggan note in their book, *A History of Sicily*, that Augustus implemented changes to the tax system, removing the tithe and replacing it with the “*stipendium*, a levy probably assessed in money on landholdings and possibly also a poll-tax.”\(^{24}\) The replacement of the tithe, which was a tax on grain, signals an important shift in the economic relationship between Rome and Sicily, suggesting Sicilian agriculture was becoming less important for feeding the Roman Empire. Finley points out that this may be due to the fertility of Rome’s newly acquired territory in Egypt and a growth in the North African rural economy.\(^{25}\) This is likely true because references to Sicily in Roman texts
begin to decrease during the reign of Augustus. After his death in 14 CE, Sicily is rarely mentioned for the following six hundred years.  

The status of Sicily during the latter years of the Roman Empire can only be surmised due to the limited amount of source material from the period. The incomplete record makes it difficult to generate definitive conclusions about the island. The lack of information is itself evidence, however because it indicates Sicily had become an extension of Italy and was fully integrated into the Empire. Romanization of the island continued with the rule of each successive emperor and was fully realized well before the fall of the Western Roman Empire in 476 CE. The agricultural economy of Sicily likely remained the same during the Imperial period and perhaps did not change until the fifth century CE, when its grain production became more important due to civil war and barbarian invasions. As the power center of the Roman Empire shifted eastward, Sicily more than likely continued to support Rome but was itself subject to barbarian and Arab incursions. Control of the island switched hands until it was reclaimed by Byzantine Emperor Justinian in 535 CE.  

2.2: Archaeological Overview of Roman Sicily

Sicily’s extensive history of occupation makes it a lucrative region for archaeological inquiry. The Phoenicians, Carthaginians, Greeks and Romans all occupied Sicily at one point in time and their remains left a lasting impression on the island’s history. For example, the Greek archaeological record in Sicily is extensive, ranging from the eighth century BCE to the third century CE and includes many sites such as the famous theatre of Syracuse, the breathtaking Valle dei Templi (Valley of Temples) near Agrigento, and the more modest Greek settlement of Morgantina. The Greeks left a considerable mark on Sicily and the legacy of their occupation...
likely continued for many years after the island was acquired by Rome. The Romans, like the Greeks before them, invested heavily in construction on their newly acquired territory.

Sicily’s prominence as Rome’s earliest overseas colony and food producer at the birth of the Roman Empire makes the island a prime candidate for archaeological inquiry, yet much of the rural Roman archaeological record on Sicily remains largely unexplored. It is undeniable that the Sicilian countryside was an important area for Roman development. Wilson contends that surface evidence makes it clear that it was “densely settled with villages, villas and farms during the Roman period.”30 One does not need to look hard to find pieces of pottery, tile and other remnants of Roman occupation, which are littered across the surface of the rural countryside.

Even though the number of Sicilian villas that have been excavated is limited, there are still some examples that provide important data. Piazza Armerina (320-330 CE) is one of the largest and most iconic villa sites ever recorded from the Roman world. The villa complex covers 1.5 hectares and has two aqueducts, fountains, lavish frescoes and mosaics that cover nearly every room and were created by African mosaicists.31 Wilson correctly states that the villa certainly provides “vivid insight into the luxurious lifestyle of a member of the aristocratic elite in fourth-century Sicily.”32 However, the allure of the lavish residential quarters occupied researchers’ attention, rather than investigation of the production aspects of the villa. Evidence of a large storehouse for crops has been found suggesting that agricultural production was indeed a part of the villa economy, however there remains little evidence to confirm this.

Another example of a fourth century villa is Caddeddi in the southeast of Sicily.33 Like Piazza Amerina, it includes intricate mosaics created by African artists, but it is a much smaller structure. The residential features speak to the elite lifestyle of the villa’s occupants, but, rooms found at the lower level - a kitchen and service quarters for the villa’s workers – provide hints
about working life on such a villa. Again, evidence for agricultural production is sorely missing from this site, but its elite style and lavish living quarters attest to the economic state of Sicily during the late Roman period.

2.3: Classical Sources

The classical sources pertaining to Roman Sicily are limited, but many have survived that contain important insights into villa agriculture and farming operations. These sources include Strabo (*Geography*), Pliny the Elder (*Historia Naturalis*) and Diodorus Siculus (*Library*). In addition, sources containing specific information related to farming practices, species of plants and villas in the Roman Empire include, Marcus Cato the Elder (*De Agricultura*), M. Tullius Cicero (*Against Verres*), Varro (*De Re Rustica*) and Columella (*De Re Rustica, De Arboribus*). Most surviving classical sources are incomplete and do not provide an extensive overview of villas, farming and plant species found on archaeological sites. Unfortunately, even fewer discuss Sicily directly except for casual references. However, they do provide contemporaneous information about aspects of the villa that are useful for gaining a greater understanding of their economies.

Marcus Cato or Cato the Elder (234-149 BCE), was a respected statesmen and author in ancient Rome. His work *De Agricultura* is one of the earliest and most complete works describing the role of the villa in Roman society.\(^\text{34}\) It is a series of notes that offer guidance on how to purchase land and manage a farm in Rome. He begins by declaring farming as the most honorable way to generate income and that farmers make the “bravest men and sturdiest soldiers.”\(^\text{35}\) His admiration for farmers likely stems from living through the second Punic War that had ended near the time of his writing and may suggest that Rome was in desperate need of farmers and villa since its bloody war against Carthage left thousands dead and undoubtedly
destroyed agricultural lands and ravaged food stores across the countryside. However, Annalisa Marzano and Guy P. R. Metraux argue in their book, *The Roman Villa in the Mediterranean Basin*, that Cato is making a deeper claim about the Roman villa that reveals “its function as a financial investment of a city based elite and its role as a manifestation of the idealization of country life.” Cato also states the types of plants a farmer should cultivate for subsistence, including various grains, legumes and fruits. For feeding cattle, he writes that a farmer should “sow clover, vetch, fenugreek, beans and bitter vetch as forage.” Clearly this information can be useful when examining the archaeobotanical material as it notes the common plants that villas at the time were producing.

Marcus Terentius Varro (116-27 BCE) was another respected writer in ancient Rome. His work *On Agriculture* is written in much of the same style as Cato’s *De Agricultura* and presents another form of instructional manual that describes agricultural operations on a Roman villa. He expresses a vast understanding of the seasonal cycles and goes into detail about when specific types of seeds should be planted, writing that “some plants are sown and grafted and harvested earlier or later than others; and while most are grafted in spring rather than in autumn, figs are grafted near the solstice, and cherries actually in mid-winter.”

Particularly interesting is his commentary on Roman villas in book III of his work, in which he presents a conversation between himself, Quintus Axius and Appius Claudius where the men discuss what truly defines a villa. Appius claims the Villa Publica is the true villa of their ancestors due to its simplicity, location and function as a meeting place for the citizen population. Axius responds that what really makes a villa is its farm and contends that if it has never “seen a cured hay harvest in the loft, or a vintage in the cellar, or a grain harvest in the bins . . . what has your villa that is like that villa which your grandfather and great-grandfather
had?" Varro’s inclusion of their discussion in his work is significant because it highlights confusion over the definition of a villa existed well before modern interpretations and that even Romans had a difficult time finding consensus.

Marcus Tullius Cicero (106-43 BCE) was an influential statesman, lawyer and is one of the most famous authors in Roman history. His body of work are some of the most extensive to have survived from classical antiquity. Cicero’s famous oration Against Verres offers us our first documented glimpse of the Sicilian countryside after becoming a Roman province. In it, he describes the corruption and mismanagement of Sicily’s former governor Gaius Verres and his crimes against Sicilian farmers and landowners. Cicero’s detailed account of Verres’ criminal behavior has the benefit of providing a window into the condition of agriculture and land ownership during the period. He pleads for sympathy for the Sicilian people, asking, “when did she not deliver the corn which she was bound to deliver, by the proper day? When did she fail to promise us, of her own accord, whatever she thought we stood in need of?” It is important to note that Cicero was clearly motivated to frame Sicily in the most positive way possible in order to win his case against Verres. However, other literary sources can confirm at least some of his statements, even if his speech against Verres contains some colorful hyperbole.

Diodorus Siculus (90-30 BCE) or Diodorus of Sicily was a Greek historian widely known for his Library of vast collections of historical recordings on events in the classical world. In addition to mentioning Sicily as the location of his birth, he also provides important insight into the island’s rich agricultural history before Roman occupation. He notes that Sicily’s fertility provided his fellow Greeks with abundant harvests that enabled them to “increase their estates and to fill the land with slaves and domestic animals and every accompaniment of prosperity.” The Romans found the island provided them with the same prosperity that it did for the Greeks
and built large villa estates and made use of slaves to take advantage of the island’s fertility. Diodorus also points out that Sicily’s rich tillage encouraged the growth of slavery, noting that most slaves were, treated as cattle, bred for slavery and even “branded with certain marks burnt on their bodies.”*42 The conditions and harsh treatment that slaves endured led to two famous slave revolts on the island known as the Servile War. Accounts of Sicily’s fertility and demand for large quantities of slaves speaks to its long history of agricultural development and exploitation of its natural resources.

Strabo (64-63 BCE to 25 CE) was an Asiatic Greek well known for his historical writing and geographical accounts. He traveled around much of the Mediterranean and eventually settled in Rome to continue his studies. In his *Geography*, Strabo details the geography and history of many regions in the classical world including Sicily. He describes various characteristics of the its geography, history, and even some important myths associated with the island. Strabo also follows in the footsteps of his predecessors by noting the importance of Sicily’s fertile soil, that “as for the fertility of the country, why should I speak of it, since it is on the lips of all men.”*43 Even so, he discusses important features of Sicilian farming and the nature of agricultural production. He goes out of his way to highlight grain, saffron and honey as three example of quality goods produced on Sicily and suggests that the island’s good may be “superior” to those from mainland Italy.*44

Another interesting insight is his discussion on vineyards near Mt. Etna. He writes about the volcano’s destructive qualities and the impact an eruption can have on the countryside but he observes that, “although the ash is an affliction at the time, it benefits the country in later times, for it renders it fertile and suited to the vine.”*45 In addition to agriculture, he states the importance of farm animals and notes that “cattle, hides, wool, and the like” were manufactured
on the island and supplied to Rome. Curiously, in the same section of text he mentions three particular cities, Syracuse, Eryx (Erice) and Enna. The reason he does so is unclear, but he may have been using them to help reference the island’s geography since Syracuse is on its eastern coast, Eryx on its western coast and Enna in the center. Another possibility is that he believed these three cities played a key role in trade across the island and that they helped supply the agricultural goods discussed in the same section. It is impossible to know for sure but the Roman villa of Gerace is located near Enna, and Strabo’s reference may suggest the importance of villas like Gerace in Sicily’s agricultural economy.

Lucius Junius Moderatus Columella (4-70 CE), another well-known Roman author, may be best remembered for his work, *De Re Rustica* (On Agriculture) and *De Arboribus* (On Trees). Like Varro and Cato, Columella’s comprehensive eleven volume work focuses on agriculture, farming, and the cultivation of various cereal crops. He writes that “the seeds of first importance and most useful to mankind are grains of wheat and emmer” and that other useful kinds of seeds and legumes are hemp, millet, panic grass, sesame, lupine, flax and barley. Barley seems to be important for many things including use as a fodder crop alongside clover, chickling-vetch and bitter vetch. Columella also provides important advice for how to construct a villa and its location and placement. He advises that the villa be placed next to running water and cautions against placement near stagnant bodies, warning that “water that always remains stagnant in a swamp is laden with death.” Additionally, Columella provides important insight into villa terminology and construction, suggesting that the villa should be divided into three building groups, *urbana* or the living quarters, *rusticam* or the farmhouse, and *fructuariam* or the storehouse. These are important distinctions because it suggests that the villa *urbana* and the
villa *rustica* are not separate types of villas, but are in fact part of the same general design for all villas in the Roman world.

Gaius Plinius Secundus or Pliny the Elder (23-79 CE) was famous for his work the *Natural History (Historia Naturalis)*. It is 37 volumes of detailed information on various aspects of the natural world including, astronomy, geography, history and agriculture. Pliny provides many pieces of information that are relevant to villas and agriculture, specifically book 18, which is dedicated to the natural history of grain. He begins by discussing the proper arrangements for a farmhouse and generally agrees with Columella, writing “that a farm-house ought neither to be built near a marsh, nor with a river in front of it; for, as Homer has remarked, with the greatest correctness, unwholesome vapours are always exhaled from rivers before the rising of the sun. In hot localities, a farm-house should have a northern aspect, but where it is cold, it should look towards the south; where, on the other hand, the site is temperate, the house should look due east.”

He suggests that Italian wheat is superior to wheat from foreign territory and ranks Sicily’s wheat as second to Boetia in terms of weight. Interestingly he writes that the wheat of Sicily is grown in the “mountainous districts” of the country. He also discusses an edible plant that only grows in Sicily called the *cactus* and is likely referring to a wild species of plant called *Cynara cardunculus* or cardoon and is similar to the artichoke.

The ancient sources have imposed a commanding influence over Sicily’s provincial history in the Roman Empire. They have largely been used as the primary source for information regarding Roman villas and as a result, influenced much of subsequent archaeological research. Complicating matters further is a limited amount of records that reference Sicily during the Imperial Era. As noted earlier, after the death of Augustus in 14 CE, Sicily is rarely mentioned in the literary sources for the next four hundred years, until about the fifth century. Knowledge of
Sicily’s agricultural economy during the Republican Era relies firmly on the literary sources. They provide evidence that the island was a primary food producer for Rome. The ancient sources certainly provide some insight into agriculture, crops and workings of the villa however, many of the sources differ in their descriptions of Sicilian settlement patterns and farming operations. As a result, the makeup of Sicily’s countryside during the era continues as a topic of intense debate among historians and archaeologists.\textsuperscript{53}

\textbf{2.4: Modern Sources}

As noted earlier, at the heart of the rural economy in the Roman world was the villa. In many ways the villa is a microcosm of Roman society. It encapsulates Rome's distinctive social and economic structure, from the poorest slave to the richest senator, and is a manifestation of their insecurities and aspirations. Very few Roman architectural achievements can so clearly illustrate what it means to be Roman better than the villa, yet its definition remains elusive. Part of the reason is because scholars continue to disagree about what exactly defines a villa. Unfortunately, initial complications begin with the ancient Roman authors themselves. The complexities involved with defining the villa cannot be understated. Accounting for the lack of consensus is disagreement over the validity of ancient texts, what defines a villa, and a general lack of cohesive archaeological evidence. As a result, little attention has been paid to the agricultural and production aspects of the villa. However, historians and archaeologists have dedicated countless hours to formulating a comprehensive understanding of the villa's history. John Percival was the first to truly summarize the full scale of villa studies in his seminal work \textit{The Roman Villa}. Percival rightfully heeds warning about how a narrow focus can distort the economic and social impact that a villa played in a specific region, yet his account primarily focuses on villas from Britain and other parts of Europe, curiously leaving Sicily nearly absent.\textsuperscript{54}
While he rightfully urges caution over generalizing characteristics of villas, he himself places his analysis of villas into broad regional categories of the Roman world. Percival is not guilty of any wrongdoing; he did the best he could with the limited amount of evidence given to him. For years, archaeologists have focused their attention on the more glamorous residential parts of the villa because they were more likely to yield impressive mosaics and artifacts. As a result, little attention has been paid to the agricultural and production aspects of the villa.

Stephen L. Dyson presents a more modern take on the theoretical debates surrounding the Roman villa and rural economy. His work nicely summarizes the history of villa studies and how archaeological evidence has been skewed in favor of the residential sections of the villa (pars urbana) over the agriculture and production areas (pars rustica). Fortunately, scholars have recently begun to challenge dependence on the written record as the principal source of knowledge for Rome’s agricultural system. The limitations of the ancient texts have reinforced a need for a broader and more in-depth archaeological examination to uncover the secrets of Sicily’s rural economy. Technological developments have allowed archaeologists to examine types of evidence that was previously overlooked during earlier archaeological studies of Roman sites.

Modern archaeologists like Roger Wilson and others have begun to make up for the lack of information regarding the economic structure of Roman villas. They have started investing more resources into examining structures outside of the residential area of villa complexes in order to generate a more authentic representation of these large estates. The Roman villa at Gerace and others like it have offered new evidence for agricultural production. The information following is some of the evidence that has been found in recent years. It is nowhere near
complete, but it is only the start of an endeavor that will help to reshape the way historians and archaeologists look at the villa economy of late Roman Sicily.

2.5: Limitations of the Literary Sources

The examination of the modern and ancient literature in the previous two sections have pointed out some of the problems that come with dependence on them as sources of evidence. The chief limitation of the ancient sources is that there simply is not enough of them. Those that have survived certainly contain helpful information to draw from, but they never provide enough to form any concrete conclusions. Secondly, the evidence they do offer must be taken with a grain of salt. Even though some of the claims made by Cato, Columella and Pliny are undoubtedly true, it is impossible to verify them as fact. The ancient sources give historians and archaeologists a sense of the experiences and preferences of Roman authors, but they fail to provide enough information to form distinctive conclusions about the daily functioning of the villa or their importance during the Imperial period.

Unfortunately, modern analysis has drawn heavily from the ancient sources to make conclusions on the functioning of Roman villas, as there are almost no other sources that can provide as much information. That is why the work of archaeologists is so important to fill in the gaps left in the written record by verifying written accounts with evidence. However, archaeology has its own problems that makes objective analysis of Roman villas difficult. Over-reliance on excavating specific areas of villa complexes ensures that large quantities of evidence are overlooked. More time, energy and resources uncovering buildings on the periphery of residential structures on site will ensure that historians and archaeologists can come closer to forming an authentic representation of the villa economy of late Roman Sicily.
Part 3: Archaeobotanical Evidence from Gerace

3.1: Brief Introduction

In 2018, the UBC excavation of the Roman villa at Gerace in central Sicily continued for its fifth season. During all five seasons, (2014-2018) soil samples had been taken in order to recover carbonized seeds and other archaeobotanical materials. To date only a preliminary examination of archaeobotanical material recovered from Gerace has been examined and it is important to note that the focus of this paper will only be considering findings from the material recovered during the 2018 seasons. The purpose of archaeobotanical sampling was to help establish the composition of Sicily’s regional environment and the agricultural economy of Gerace through analysis of both domestic and wild plant species.

3.2: Archaeobotanical Methodology for Gerace

During the 2018 excavation season at Gerace, 29 soil samples were taken by excavation staff to recover carbonized archaeobotanical remains including seeds, charcoal and other plant parts that could be identified as botanical material. 21 of those 29 samples yielded carbonized botanical remains, in addition, bones from mammals and fish were identified during material examination. The 2018 samples were taken from three areas on the site, D3, D4 and F. (Figure 2) Sample selection was determined based on location and gathered from various contexts such as floors, rooms, fill and ash deposits. Analysis of the material recovered from all contexts will form the discussion that follows.
The soil samples were measured in liters ranging from 1-19 and placed in plastic bags. These samples were processed in the field using the water flotation method. Water flotation is a technique that uses the natural differences in density of organic and inorganic objects to separate organic material from soil. Deborah Pearsall points out that when the flotation method is properly utilized, “it allows recovery of size classes of botanical material preserved in a sediment sample, making quantitative analysis possible.” Carbonized botanicals and other materials were recovered from the soil matrix in three parts: (1) material that sank in the flotation tank (heavy fraction) and was captured in a 1 mm mesh screen; material that floated (fine and coarse fraction) and was caught using (2) 1 mm and (3) 300 µm sieves. Once collected, the material was dried,
packaged and shipped to the lab at the College at Brockport State University of New York for analysis. From the spring of 2018 to the spring of 2019, the samples were sorted and identified using a Leica stereoscopic microscope at up to 40 x magnification. The recovered plant materials consisted of carbonized seeds, chaff and other charred organic material.

The samples from Gerace were identified by comparing morphological characteristics of the botanical remains with findings from previous excavation seasons, related studies, seed atlases and professional consultation. However, the most important contributions to the identification process was from Dr. Jennifer Ramsay and her archaeobotanical reference collection at the College at Brockport, State University of New York. Her guidance, support and expertise were key to the findings in this study.

3.3: Results

The carbonized material recovered from Gerace during the 2018 excavation was taken from multiple different contexts in Areas D3 (Bathhouse), D4 (Byzantine Settlement) and F (Kiln) of the site. The material from 2018 has yet to undergo radiocarbon analysis, however, carbonized grain recovered during the 2015 season at Gerace has been analyzed and found to date somewhere between the late-fourth century and early-fifth century CE.\(^{59}\) Additionally, burnt material recovered from the kiln in Area F during the 2018 excavation dates even later, to the early Byzantine phase of occupation during the sixth century CE.\(^{60}\) Carbonized botanicals were recovered from all sample areas, totaling 35 unique identifiable species in total (Table 1).
<table>
<thead>
<tr>
<th>Category</th>
<th>Species</th>
<th>Raw count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cereals</td>
<td><em>Hordeum vulgare</em></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><em>Triticum</em> grains indet.</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Cereal grain indet.</td>
<td>37</td>
</tr>
<tr>
<td>Legumes</td>
<td><em>Vicia ervilia</em></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><em>Vicia faba</em></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><em>Pisum</em> species</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Large legume indet.</td>
<td>12</td>
</tr>
<tr>
<td>Fruits/nuts</td>
<td><em>Olea europaea</em></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><em>Ficus carica</em></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><em>Vitis vinifera</em></td>
<td>5</td>
</tr>
<tr>
<td></td>
<td><em>Vitis vinifera - peduncle</em></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><em>Rosa</em> sp.</td>
<td>1</td>
</tr>
<tr>
<td>Weed and wild species</td>
<td><em>Malva</em> sp.</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td><em>Medicago</em> sp.</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td><em>Carex</em> sp.</td>
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</tr>
<tr>
<td></td>
<td><em>Phalarus</em> sp.</td>
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<tr>
<td></td>
<td><em>Lolium</em> sp.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><em>Sheradia</em> sp.</td>
<td>2</td>
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<tr>
<td></td>
<td><em>Chenopodium</em> sp.</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td><em>Silene</em> sp.</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><em>Viola</em> sp.</td>
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</tr>
<tr>
<td></td>
<td><em>Galium</em> sp.</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td><em>Melilotus</em> sp.</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td><em>Fumaria</em> sp.</td>
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<tr>
<td></td>
<td><em>Rumex</em> sp.</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td><em>Calendula</em> sp.</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><em>Cladium</em> sp.</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td><em>Agrostema</em> sp.</td>
<td>10</td>
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<tr>
<td></td>
<td><em>Astragalus</em> sp.</td>
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<tr>
<td></td>
<td><em>Lithospermum</em> sp.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><em>Brassicaceae</em> sp.</td>
<td>3</td>
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<tr>
<td></td>
<td><em>Viburnum</em> sp.</td>
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<tr>
<td></td>
<td><em>Lilaceae</em></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><em>Gramineae</em> indet.</td>
<td>74</td>
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<tr>
<td></td>
<td><em>Caryophyllaceae</em></td>
<td>10</td>
</tr>
<tr>
<td></td>
<td><em>Heliotropium</em> sp.</td>
<td>63</td>
</tr>
<tr>
<td>Misc. plant material</td>
<td>Flowering head</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Paranchymous Tissue</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Indet. seed</td>
<td>182</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>710</td>
</tr>
</tbody>
</table>
The findings include many varieties of economic crop species associated with intensive agriculture. These are represented by the cereals, *Hordeum vulgare* (barley), *Triticum* sp. (bread wheat) and the legumes *Vicia ervilia faba* (broad bean) and *Pisum* sp. (common pea). Other crops include fruit and nut species, such as *Olea europaea* (olive), *Vitis vinifera* (grape) and *Ficus carcia* (fig). By far the largest body of seeds recovered are represented by a variety of non-economic species weeds and grasses, which include but are not limited to, *Malva* sp. (mallow), *Medicago* sp. (Lucerne/medick), *Phalarus* sp. (canary grass), *Chenopodium* sp. (fat hen), *Galium* sp. (woodruff/bedstraw), *Cladium* sp. (sawgrass), *Heliotropium* sp. (flowering weed) and *Gramineae* sp. (grasses). Additionally, one flowering head and unidentified paranchymous tissue (fruting bodies) fragments were also recovered.

3.4: Discussion

The archaeobotanical assemblage from Gerace contains a variety of unique species that can provide new insight, or substantiate textual data, regarding the villa economy of late Roman Sicily. Information from carbonized botanicals found in different contexts on the site can also provide information on the possible function of an area. For example, the bathhouse structure of Gerace has provided evidence of common domesticated crops and other agricultural goods that were cultivated on Sicilian villa estates during the Late Roman period. At first it may seem odd that a bath house contains information that is relevant to farming production on the estate, but it begins to make sense once one considers how the plant material may have been incorporated in these contexts. Between 450-500 CE the bath house was damaged by an earthquake. Shortly after, repair efforts began at the bath house, but they were soon abandoned, the area was then looted and filled in with soil.\(^{61}\) The reasons for this are unknown but it may have something to do with the ensuing chaos that began due to the collapse of the Roman Empire. Whatever the
reason, the deposits contain a mix of refuse from the area including bones, pottery and, importantly, carbonized seeds.

Carbonized remains of *Triticum sp.* (wheat), *Hordeum vulgare* (barley) and a large amount of other fragmented cereal grains were found in sediment samples taken from the deposit in the *Frigidarium* (room 6) of the bathhouse. (Figure. 3) The presence of wheat and barley in the 2018 material is not unexpected but provides direct evidence of their cultivation at Gerace. In 2015, excavation of an unfinished villa, southwest of the bathhouse site, uncovered the carbonized remains of a large cache of harvested crops in the *Horreum* (storeroom) that was engulfed in a fire around 450 CE. These findings seem to validate many of the claims in the ancient sources about the importance of Sicilian grain production, specifically wheat and barley that were the two main agricultural crops produced on the island. In addition to the ancient sources, palynological and archaeobotanical research has helped to confirm Sicily’s prominence as a center for cereal grain production and other agricultural products for the Roman Empire.

![Figure 3 Percent distribution of cereal grains by period and area at Gerace](image-url)
Even though both wheat and barley were a significant part of Rome’s agricultural economy, both were not necessarily valued equally. Indeed wheat, G. E. Rickman writes, “was vital to the diet of the ancient Mediterranean world . . . and it was by far the most important, and cheapest, source of calories for the majority of the population.” The Romans on the other hand regarded barley as a food fit for the lower class. Pliny wrote that “Barley bread, which was extensively used by the ancient, has now fallen into universal disrepute, and is mostly used as a food for cattle only.” However, the Greeks preferred barley and it was likely an important food for all social classes in the Hellenistic world. The Greeks had occupied Sicily well before the Romans turned it into a province. Therefore, it makes sense that Sicilian farming would reflect a desire for barley and wheat as their main economic cash crops. Recent excavation of an early Iron Age site on Sicily called Selinunte help to confirm the importance of cereal grains on the island. Archaeobotanical evidence recovered from the Sicilian Greek harbor town of Selinunte is consistent with the plant material found at Gerace and includes wheat, legumes, olives and even grapes. Additionally, the Romans used barley not just for cattle but other farm animals. It is possible that if slaves were housed at Gerace, they may have been using the barley in meals as well as for beer production. The ancient sources make it clear that Romans viewed beer as a drink for “uncivilized” people and slaves who were often captured from barbarian tribes, likely produced it for their own consumption. Either way, both were undoubtedly important for the successful operation of any farmstead in the Roman world.

In addition to cereal grains, evidence for other edible crops were found at Gerace, which consisted of legumes including, broad bean (Vicia faba), bitter vetch (Vicia ervilia) and
common/grass pea (*Pisum* sp) noted in Figure 4. Interestingly, evidence for broad bean was only found in area D4, the Byzantine layer of occupation, while bitter vetch was only found in D3, the late Roman occupation layer. It is hard to say if this contrast marks a significant change in what legumes were produced at Gerace between periods of occupation and further analysis could prove helpful in addressing this question. Pliny mentioned in his *Natural Histories* that bitter vetch has “certain medicinal properties” that even cured Emperor Augustus of an illness.\(^70\) It is possible that bitter vetch continued to be an important agricultural crop well into the Byzantine era.

![Percent Distribution of Legumes at Gerace by Period and Area](image)

*Figure 4. Percent distribution of Legumes by period and area at Gerace.*

Additionally, evidence of olive (*Olea europaea*) and grape (*Vitis vinifera*) were obtained from the samples. The four olive pits that were recovered come from the bathhouse and it is likely they were waste product placed in the fill layer that was deposited into the frigidarium after abandonment. Olives were an important part of the Roman diet but whether they were grown at Gerace or imported is up for debate. The grapes have much more interesting
implications for life at Gerace. Only four grape samples were found in the early Byzantine settlement in area D4. (Figure. 5) This may suggest that elite life continued at Gerace well after 500 CE, when it was thought to have ended.\textsuperscript{71} Unfortunately, there is not enough evidence present in the 2018 material to make an objective conclusion. Further analysis on the remaining material that was sampled may provide more concrete proof.

![Percent Distribution of Fruit at Gerace by Period and Area](image)

\textit{Figure 5 - Period and distribution by area of fruit and nut species at Gerace.}

Some of the most compelling archaeobotanical evidence at Gerace comes in the form of weeds and grass seeds. A large amount of \textit{Malva} sp. (Mallow), \textit{Medicago} sp. (Medick), \textit{Galium} sp. (Bedstraw), \textit{Gramineae} indet. (Grass) and \textit{Chenopodium} sp. (Fat hen) were identified in the assemblage. All are commonly found in agricultural fields and their identification suggests farming operations were a consistent part of economic life at Gerace.\textsuperscript{72} Some species of \textit{Chenopodium} were cultivated as a cereal crop in the past and holds nutritional value.\textsuperscript{73} One of the more interesting finds was a large amount of \textit{Heliotropium} sp. (heliotrope) within an ashy deposit from the apse of the bathhouse in D3. (Figure. 6) Heliotropes are highly poisonous to mammals and specifically to grazing herbivores.\textsuperscript{74} It is possible that the late Roman inhabitants
of Gerace knew this and were actively cutting it and burning it to prevent their livestock from ingesting it while grazing. The large amount contained in the ashy deposit within the apse seems to support this considering that relatively few were recovered from the site elsewhere.
Figure 6 - Percent distribution of weed species found in the assemblage by period.

Part 4: Conclusions

Archaeobotanical evidence gathered from Gerace together with textual evidence offers a unique insight into the agricultural economy of late Roman Sicily. Hidden in the island sediment are more clues to understanding Sicily’s ancient past. Archaeobotany, together with texts, provides archaeologists with the opportunity to reconstruct the agrarian landscape of Sicily and create new insights into its villa economy. By using multivariate methods to examine the past, we can gain a greater understanding of the relationship between Sicily’s rural economy and Rome’s greater agro-pastoral system. Central to addressing these questions are archaeological excavations of Roman villas, like Gerace.
Although limited, the findings from the 2018 material reflect a long history of farming and plant cultivation on the island since well before Roman occupation. As noted by ancient authors, the Romans took advantage of Sicily’s fertility through the use of villa estates. The plant assemblage recovered from Gerace largely reflects the evidence from classical sources that support the island’s rich farming history. Many of the plants that Cato and Pliny mentioned in their texts appear in the archaeobotanical assemblage from Gerace and at least provide partial evidence for their claims. Additionally, authors like Strabo and Cicero emphasized Sicily’s prominence as one of Rome’s main agricultural hubs and the wide variety of seeds recovered from Gerace hint at the wide variety of crops produced on site. One does not need to look hard to see how important Sicily was for ancient Rome’s agricultural economy. Even though some evidence has been found to corroborate the claims of many of ancient authors, the ideas about farming that Cato and Varro discussed at length requires more physical evidence to verify. Only further archaeological excavations investigating the rural side of villa life will help to confirm the reality of farming operations on Gerace and Roman villa’s in general. Even so, evidence for the island’s significance as a center for rural cultivation can be found by examining the countless farms that dot the Sicilian countryside today.

The island’s continuing dedication to agriculture, falls in line with its ancient legacy as the breadbasket of Rome. Evidence for the various cereal crops, legumes, fruits and nuts speak to the vast network of Sicilian villas and their agricultural economy that helped feed an empire. They continued to do so well into the later years of the Roman Empire and new findings from Gerace suggest that they did so into the start of the Byzantine period. More archaeobotanical research needs to take place in order to draw concrete conclusions about the true nature of the agricultural economy of late roman villas on Sicily. As of now, findings from Gerace continues
to help shed light on Sicily’s important contributions to the Roman Empire and the greater Mediterranean world.


7 Percival, *The Roman Villa*, 118.


12 Percival, *The Roman Villa*, 34.


26 Finley, Smith and Duggan, *A History of Sicily*, 41.

27 Finley, Smith and Duggan, *A History of Sicily*, 42.

28 Finley, Smith and Duggan, *A History of Sicily*, 42.


31 Marzano, Annalisa and Metraux, *The Roman Villa in the Mediterranean Basin: Late Republic to Late Antiquity*, 203.

32 Marzano, Annalisa and Metraux, *The Roman Villa in the Mediterranean Basin: Late Republic to Late Antiquity*, 203.

33 Marzano, Annalisa and Metraux, *The Roman Villa in the Mediterranean Basin: Late Republic to Late Antiquity*, 209.

34 Marzano, Annalisa and Metraux, *The Roman Villa in the Mediterranean Basin: Late Republic to Late Antiquity*, 42.

36 Marzano, Annalisa and Metraux, *The Roman Villa in the Mediterranean Basin: Late Republic to Late Antiquity*, 43.


40 Cic, Ver 2.2.5. [http://data.perseus.org/citations/urn:cts:latinLit:phi0474.phi005.perseus-eng1:2.2.5](http://data.perseus.org/citations/urn:cts:latinLit:phi0474.phi005.perseus-eng1:2.2.5)


42 Diod, 34. 2. [http://attalus.org/translate/diodorus34.html](http://attalus.org/translate/diodorus34.html)


46 Columella, *De Re Rustica and De Arboribus*, 141. [http://penelope.uchicago.edu/Thayer/E/Roman/Texts/Columella/de_Re_Rustica/2*.html#ref40](http://penelope.uchicago.edu/Thayer/E/Roman/Texts/Columella/de_Re_Rustica/2*.html#ref40)

47 Columella, *De Re Rustica and De Arboribus*, 61. [http://penelope.uchicago.edu/Thayer/E/Roman/Texts/Columella/de_Re_Rustica/1*.html#ref43](http://penelope.uchicago.edu/Thayer/E/Roman/Texts/Columella/de_Re_Rustica/1*.html#ref43)

48 Columella, *De Re Rustica and De Arboribus*, 67.


52 Finley, Smith and Duggan, *A History of Sicily*, 41.


57 R. E. Witcher, “Agricultural production in Roman Italy,” in *A companion to Roman Italy*, (Chichester: Wiley-Blackwell, 2016), 2.


68 Hans-Peter Stika, Andreas G. Heiss and Barbara Zach, “Plant remains from the early Iron Age in western Sicily: differences in subsistence strategies of Greek and Elymian sites,” *Veget Hist Archaeobot* (2008), S141. DOI 10.1007/s00334-008-0171-9


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