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Sustainable Agriculture in Ancient Rome

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Introduction

sustainable \sə-ˈsta-nə-bəl\ **1:** capable of being sustained **2a:** of, relating to, or being a method of harvesting or using a resource so that the resource is not depleted or permanently damaged <~ techniques> <~agriculture>[1]

Sustainable agriculture discourse describes agricultural practices and techniques used to maintain land fertility. At its broadest definition, sustainable agriculture aims to make land hospitable to cultivated crops for an indefinite amount of time. The discourse itself has only arisen in response to increased industrialization of world food production, but practices included in, and ideals behind sustainable agriculture have existed for millennia. Ancient Roman agrarian writing can be viewed as embodying the principles and ideas of sustainable agriculture, though the discourse did not yet exist to articulate it as such.

Authors writing during the Roman Republic have articulated many farming practices in their texts. Their purpose was to educate current and future farmers in successful methods of cultivation. Agricultural success was integral to their very survival, for if crops could not be harvested there was no way to eat and sustain life. In order to continue living in the same place and continue to reap productive harvests, practices had to be undertaken to ensure the land maintained its fertility. Columella, Varro, Cato, Virgil, and Pliny all helped articulate agricultural ideals in their writing and encouraged further study and teaching of agriculture.

In modern times, a specific discourse has arisen to challenge industrial agriculture and highlight the importance of maintaining land fertility. This writing defines practices and principles integral to sustainable agriculture, the basis of which is preserving the

[1] Merriam Webster 1188.

continued fertility of the land. These practices include crop rotations, utilization of symbiotic relationships between plants and animals and among various plants, farming on a scale at which the farmer can have knowledge of all land conformations, and adapting to the seasonal variations of the region. These agricultural principles encompass the longer timeline associated with sustainable agriculture – a key differentiation from commercial agriculture. In conventional agricultural practices, the amount of time to produce a crop must always be decreased through greater efficiency in order to gain a larger profit. Alternatively, in sustainable practices, health and continued soil fertility are the most important aspects. In this light, time is not such a limiting factor in sustainable agriculture, so care can be taken in cultivation and seasonality can be recognized and respected.

The current discourse on sustainable agriculture, when compared with Ancient Roman agrarian writings, shows remarkable similarities. Both types of literature emphasize the honor and prestige associated with farming and the role that agriculture plays in civilization. Beyond this, they both outline similar practices of taking and giving back to the land. A similar association of small-scale farming and longevity is also established. These similarities arise not only out of content, but also from the position of relative social and educational privilege of the modern and ancient authors.

In modern literature about sustainable agriculture, there are two main categories of writings – those which are based in a scientific perspective, and those which are based in social scientific perspectives. Scientific writings relate to specific agricultural practices and often try to find or prove the reasons behind their success. Social scientific perspectives, on the other hand, attempt to describe the holistic benefits sustainable

agriculture imbues on the land and on society. In this work, I chose to use the social scientific perspective because I see it as a modern equivalent to the ancient agrarian texts. These types of works seem to hold similar places in modern and ancient societies – both instructing and persuading the audience of a social and environmental responsibility to carry out the practices described. This social aspect is also extant in evidence of ancient Roman laws and fables. This other evidence helps develop the context for ancient agrarian writings and relates to ideals expressed in modern sustainable agricultural texts.

Though they are similar in content and social context, the imminent necessity of sustainable practices varies between modern and ancient times. Ancient Romans undertook sustainable practices out of necessity, to ensure their own personal survival. In the modern era, alternatives exist to sustainable practices. These industrialized practices often include artificial fertilizers and pesticides, massive mechanization, and large-scale operations. Sustainable agriculture can be forgone for a limited time period, while artificial inputs increase yield in the short term. In this sense, the timeline of agriculture can be more easily manipulated in modern times so that inhospitable environments are masked whereas in ancient times, the land could only yield its true fertility.

Ancient agrarian texts describe practices that can be seen as sustainable. In modern times, sustainable agricultural texts describe practices undertaken by only a small minority. It is impossible to tell from these ancient writings how farms were run and to what extent these texts were read and applied. Their existence shows however that the questions were being raised, so study based entirely on these texts gives a purely intellectual view of agrarian happenings in Ancient Rome.

Chapter 1: The Discourse of Sustainable Agriculture

Though sustainable agricultural practices have existed practically as long as agriculture itself, a specific discourse on the matter has only arisen in the past hundred years in response to increasing industrialization of our national and worldwide farming practices. The main goal of sustainable agriculture is to preserve continued land fertility. The methods, timeline, and even the definition of fertility itself can vary based on the farmer's commitment to its principles with the result that sustainability itself can be broadly and subjectively defined. These broad and idealistic principles have been laid out by farmer-authors in the past one hundred years and have gained a new following recently due to a renewed interest in environmentalism and food quality[2].

Wendell Berry, Sir Albert Howard, J.I. Rodale, Wes Jackson, and Rudolf Steiner all wrote seminal works concerning sustainable agriculture. Wendell Berry, in The Unsettling of America: Culture and Agriculture, concentrates on the holistic nature of sustainable agriculture. He philosophizes on "kindly use" of the land and the resulting strengthening of interpersonal and cultural relationships[3]. Berry highlights the amount of labor and awareness necessary to farm successfully and sustainably as well as the self-control needed to restrict the use of prolific but destructive practices. Rudolf Steiner also perpetuates the holistic nature of farming and the balance that exists between input and output. He promotes the use of herbal remedies and soil inputs as well as performing agricultural practices based on an astronomical calendar. Sir Albert Howard, an early

[2] This is exemplified by the founding of Slow Food in 1989 (an international organization promoting "good, clean, fair" food and committed to the preservation of heritage plant and animal varieties), the increasing popularity of farmers markets to bring urban residents closer to their food, and the vegetable garden on the White House lawn. Popular authors such as Michael Pollan and Eric Schlosser, as well as movies like *Food, Inc*. have also brought more awareness to food and environmental issues.

[3] Berry 31.

proponent of organic growing, approaches the concept of sustainability from a more scientific standpoint, but still recognizes the soil's intricate nature and complex relationship with other organisms. Rodale, like Howard, is often considered a fundamental author in the organic food movement. His relevance to sustainable agriculture discourse is obvious in his recognition of the importance and interconnected nature of soil microorganisms and the health of the soil. He further links this soil health to prolific plant growth. Rodale also draws a connection between holistic growing practices and human health. In a commentary on the relative lack of sustainable practices today, Wes Jackson recognizes the deteriorating quality of American farmland. With the similar aim of continued land fertility, he proposes ameliorating these effects largely through the use of perennial rather than annual crops[4]. These authors all describe the need for agriculture that does not inflict harm on the land and all suggest practices toward this end.

Sustainable agriculture discourse has been driven and shaped by opposition to detrimental modern agricultural practices. Modern practices are based on control of the land rather than on working with its natural processes. Typical American farming embraces the use of chemical fertilizers, pesticides and herbicides, massive mechanization, and it above all promotes efficiency[5]. As the scale of farming grows, so must its efficiency. This efficiency and standardization is driven by a corporate interest in low prices of raw goods, resulting in extremely low profit margins for farmers. This in turn forces farmers to either "get big or get out" [6]. A farmer attempting to use fertilizers and mechanization cannot make enough profit to afford these technologies without

[4] Jackson 107.
[5] Billard.
[6] Billard.

enormous expansion. On this titanic scale, byproducts such as animal waste are produced in such volume that they must be "dealt with" rather than integrated back into the system[7]. This attempt to control the land is having detrimental effects on our nation's soils and people. These effects are illustrated by massive erosion, increasing development of resistance to insecticides and herbicides, the widespread use of manipulated natural processes with unknown consequences or side effects, and population shifts away from rural areas[8]. Sustainable agriculture authors have recognized these adverse effects and promoted alternate, time-tested methods such as crop rotation and use of symbiotic relationships – all done on a small scale, manageable by one or a few individuals[9].

Organic and biodynamic agricultural principles are similar to sustainable ones, but vary in key ways. Proponents of all of these practices recognize that soil health matters in attempting to grow strong and successful plants, and it therefore must be preserved or renewed. Organic practices, especially at their inception, mirrored sustainable practices in using or replicating natural processes to maintain land fertility[10]. This generally consisted of recognizing naturally occurring actions or processes and enhancing or perpetuating them to a specific end. Organically grown products can be sustainable, but often are not due to a more reductionist view of natural processes. Instead of embracing the fabulous interconnectedness between the land, our survival, and our well-being, organic proponents tend to reduce the large-scale connections to small, easily replicable processes. This is exemplified in the strict regulation organically

[7] Billard.
[8] Berry 107; Jackson.
[9] Berry 31.
[10] Rodale 6.

produced crops are subjected to today, as well as by the large scale that organic agriculture is, or can be, produced at. Additionally, while sustainable agriculture must inherently take place on a small scale for the farmer to have intimate knowledge of all characteristics of the land which affect growing, modern organic agriculture takes place on a scale rivaling modern industrial practices[11]. The disregard for scale is justified by organic farmers and purchasers of organic products because organic practices aren't necessarily defined by knowledge and connectedness to the land, but by the belief that naturally based inputs can have the same positive effects as full-fledged natural processes. Furthermore, the "National List of Allowed and Prohibited Substances" for organic products is determined by legislative and lobbying practices rather than a commitment to the present and future health of the land, and includes very strict and limited restrictions on what constitutes "organic"[12].

Followers of biodynamic agriculture believe that all living things are connected and therefore practitioners of these ideas embrace an extremely sustainable and holistic approach to farming. Biodynamic farming goes so far as to incorporate astronomical influences on growth, largely based on planetary and lunar events[13]. The moon and planets each enact various responses on seeds and growing plants. Therefore, a biodynamic farmer must carefully replicate many natural processes and pay close attention to astronomical forces in order to produce large harvests. Land quality and

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[11] Berry 31.

[12] "National Organic Program" This regulation specifies many sustainable practices that must be undertaken to constitute organic production, but also allows exceptions to these standards, specifically related to the seed stock, in the case of temporary variances on soil inputs or seed coatings. Prohibited substances are allowed if federal or state regulations require them, and non-organically approved synthetic substances are allowed to coat seeds or help produce a planting stock "when an equivalent organically produced or untreated variety is not commercially available"§205.204. Additionally, documentation must be kept of all inputs and monitoring practices – this creates a great deal of extraneous work for already time-pressed farmers.

[13] Steiner 22.

fertility are preserved through typical sustainable inputs as well as specific herbs and an emphasis on curing manure in buried cow horns[14].

Fertility itself can be defined variably. Howard defines it as the ability to grow crops "to perfection", while Berry claims that "agricultural fertility is the survival of natural processes in the human order"[15]. In any case, sustained agricultural fertility depends on successful growth of healthy and nutritious plants, fully dependent on healthy soil rather than artificial inputs to achieve this growth.

Soils have been formed under complex and time-intensive geologic processes of weathering and decay – many of these processes are still occurring in and on the soil by bacteria, organisms, microorganisms and plants themselves[16]. By recognizing and encouraging the interconnected processes that living things (both plants and animals) share with the land, optimal fertility can be created and preserved.

Earthworms and certain fungi, bacteria, and microbes are known to have positive effects on soil health. Earthworms play a unique role in aerating the soil as well as in converting soil nutrients into a more accessible form for plant roots as a byproduct of their digestion. Mycorrhizal fungi also play an extremely important role in breaking inputs down to facilitate this absorption of necessary nutrients through a plant's roots[17]. Beyond this, plants and animals can have a mutually beneficial relationship. Animals can be used for labor in plowing or other purposes (as producers of meat, milk, eggs, wool, or other specific uses), and the manure from various animals provides invaluable input to soils. They are often quite adept at eating plants that are not digestible by humans, or at

[14] Steiner 72.
[15] Howard 26; Berry 130.
[16] Kohnke 61.
[17] Rodale 6.

grazing in terrain inaccessible for cultivation[18]. The manure these animals produce is extremely beneficial for growing plants because it provides additional soil mass, a host for fungal operations to occur in, and beneficial nutrients[19].

Food crops inherently deplete nutrient resources in the soil in their harvest, but actions can be taken to replace what was lost. The addition of organic matter, especially partially decomposed plant matter known as compost or aged manure provides beneficial soil characteristics and nutrients to the land[20]. Plant stalks and other unharvested material can even be tilled directly back into the soil. A healthy, fertile soil is able to easily and quickly decompose this material into useable nutrients, but a severely depleted one will take a longer time because of lower populations of beneficial microbes and fungi. These inputs are most effective decomposed, or cured, before they are incorporated into the fields in the form of compost. Heaps or pits are used for this curing, and both methods have strong positive influences on the strength and growth of plants they eventually help support, because of the time allowed for decomposition by bacteria, organisms, and microorganisms[21]. Aging manure is also an important process because it kills viable weed seeds that may be present and which could otherwise compete with the planted crop.

Adding compost or manure helps restore depleted soil nutrients, but another sustainable method, crop rotation, helps alleviate the pressure on the land at any given time. Different plants and plant families put distinct pressures on soils for varying resources. Rotating these plants to different physical areas by year or by season helps

[18] Berry 140.
[19] Howard 165.
[20] Rodale 30.
[21] Howard 45.

regulate the nutrient draw from any specific area of land. Rotation also makes it more difficult for pests and diseases that may have had an impact in a past year to strike again because of a lack of proximity of plants in the same family. Some plants, like legumes, even have a restorative effect on soils. Leguminous plants are called "nitrogen fixers" because of their ability to synthesize nitrogen from the air into a plant-accessible form in the soil[22].

In order to rotate crops, various plants and plant families must be present; therefore diversity is inherently necessary in crop rotation and also key to agricultural success. In mono-cropped fields (as practiced by industrialized agriculture), a single pest or disease can jeopardize the success of the entire crop or harvest. This creates the need for increasingly powerful pesticides and herbicides to elicit control. In a diversely planted area, it is much more difficult for a single disease or pest to wreak havoc on the entire area. This contributes to a durable agricultural system rather than a vulnerable one[23].

Leaving land fallow is a necessary part of the rotation of diverse crops because it allows beneficial soil characteristics time to rejuvenate[24]. Nitrogen fixers are often planted in fallow land and have beneficial impacts because of the importance of the soil nitrogen content for the growth of many plants. Once the growing season is over, the cover crop can be plowed into the soil to add to the fertile land mass. Leaving land fallow can also give soil structure time to recover. The plant roots can take advantage of soil porosity and create more spaces in the soil while little compaction is taking place from above. When an area is left fallow and won't be harvested, a planted crop is

[22] Kohnke 57.
[23] Berry 46.
[24] Rodale 201.

extremely important in helping to prevent soil erosion – the roots physically hold land in place so it is much less prone to erode with water or wind.

Sustainable agricultural practices prevent soil erosion through the use of cover crops, methods of plowing, and farming on a small scale. Soil erosion can cause enormous problems for land fertility because it depletes the landmass[25]. A higher amount of land mass means there is more physical space for water holding capacity. This makes an area less prone to severe drought or flooding because the large land mass can temper drastic water changes. Soil erosion also takes away the fertile, nutrient-rich topsoil, leaving behind soil that is less weathered and hospitable to plant growth[26]. To limit this, contour plowing is done perpendicular to slopes in fields so soils are semi-terraced. This helps hold the soil in place because it inhibits the creation of channels for water to flow and erode the fields. Farming on a small scale also ensures that no enormous swaths of land are ever tilled and left unplanted for very long leaving the soil susceptible to wind erosion. These practices, along with maintaining a planted crop, help to conserve landmass[27].

Sustainable agriculture also recognizes the impact that time has on farming operations. Unlike conventional practices, sustainability values land quality over efficiency. Maintaining soil fertility requires gradual and cumulative efforts and because of this, time is not the major determinant in sustainable agriculture. There is therefore an inherently longer period for return of investment[28].

[25] Kohnke 124.
[26] Rodale 206.
[27] Berry 10.
[28] Benbrook.

A farmer completes sustainable operations seasonally, working with the land as it is most ready to produce rather than creating false conditions under which to farm. This also incorporates the embracing of specific soil, topographic, or climatic characteristics that are most hospitable to certain plants. An understanding and embracing of these processes in a small, specific area exemplifies the nature of sustainable agriculture to adapt to regional characteristics rather than attempting to subordinate or control nature[29].

Sustainable agriculture proponents realize the cyclical nature of life and manipulate energy chains for the most efficient use and reuse of energy[30]. This involves returning to the ground much of what was depleted by previous crops through adding compost or manure, or plowing under cover crops to maintain a healthy balance of growth and decay in the soil[31]. This can be accomplished without exclusive use of modern conveniences such as petroleum driven machines, but requires commitment, hard work, and an understanding of the geographical and climatic context within which the farm exists.

As previously mentioned, some sustainable agriculture proponents argue that even celestial events and cycles can have an effect on plant growth. Rudolf Steiner argues that 'cosmic and terrestrial forces' both influence biodynamic farming. He claims that seeds contain a cosmic force; once affected by chaos, the seed sprouts and becomes earthly[32]. Growing plants are further affected by specific planets that regulate fertility and determine if they will produce seed or continue to grow each year[33]. The moon, too

[29] Berry 101.
[30] Berry 83.
[31] Howard 25.
[32] Steiner 36.
[33] Steiner 23.

influences water patterns and plant growth[34]. This lunar and planetary influence is strong enough to control the cycles of growth and therefore when planting and harvesting should occur[35]. This is based on the celestial body's distance from and relationship with the earth, which varies as it corresponds with season and year.

All of these factors highlight the long timeline of sustainable agriculture. In this light, the land is not viewed as a mineable resource, but rather a living being that will not support growth unless it is cared for[36]. There is a strong implication of slow but gradual improvement. Using sustainable practices, there is a longer time frame for return on investment than in conventional agriculture. For this reason, tenant farmers are often regarded as unsustainable because they have no future claim on the land and therefore little reason to care for its long-term viability[37].

Sustainable agriculture promotes the relationship between interconnected land and living things as well as the time-related aspect of growing plants. Naturally, practices that are largely human-oriented are questioned, though farmers often practice them out of necessity. Tilling, mechanization, and genetic seed modifications are all viewed skeptically but still practiced in sustainable agriculture, though tilling and mechanization are generally more accepted than genetic modifications. Land tillage itself can be questioned as a practice of sustainable agriculture. While tilling is promoted to aerate land and disturb weed growth, it also destroys the complex soil structure that develops over thousands of years of weathering and animal influence[38]. Alternate methods have

[34] Steiner 24.
[35] Steiner 121.
[36] Berry 6.
[37] Rodale 204.
[38] Jackson.

been used such as burning weeds, or use of perennial crops, but none produce as prolific a harvest as tilling.

Mechanization is also problematic because it tends to compact soils. Beyond this, it distances the human connection between farming and the food produced. The skill and intimate connection from man to land is diminished in the constant use of technology[39]. The increasing speed associated with mechanization and the massive use of technology causes a decline in the care of and responsibility to the land. In this light, mechanization lessens the emotional or moral connection with the land: "a machine has no life and for this reason it cannot of itself impose any restraint or any moral limit on behavior"[40].

Sustainable agricultural practices are developed with knowledge that is passed down from one generation to the next. Successful practices are recognized and continued through generations, creating 'cultural capital'. As natural selection dictates, unsuccessful agricultural practices will either be discontinued, or result in the death of the people practicing them. In any case, only the most successful methods will retain their usefulness. This is assumed on an infinite time scale – therefore, agricultural practices with the potential for long-term success (i.e. sustainable ones) should be studied and replicated in our modern society to ensure our cultural success and survival.

[39] Berry 91.
[40] Berry 93.

Chapter 2: Ancient Roman Agrarian Texts

Many writers in ancient Rome covered topics pertaining to agriculture. These agrarian writers dispensed advice for literate Romans during the Roman republic and empire. Many of these texts have survived to the modern day. Cato's *De Agri Cultura*, Varro's *Rerum Rusticarum*, Virgil's *Georgics*, Columella's *Rei Rusticae*, and Pliny's *Naturalis Historia* constitute the core Roman agrarian authors and texts. Some of these authors also cite works that have not survived to the modern day. Through the works of Columella, Varro and Pliny, we know some of the beliefs of prior or contemporary authors, Saserna, Cassius, and Scrofa, in addition to their own ideals.

Cato lived from approximately 234-149 BC, completing a successful military and political career during the Punic Wars[41]. During his life, Cato published countless speeches as well as historical texts and the *De Agri Cultura*. His agricultural interests developed at a young age on his father's farm and continued throughout his life. His interests culminated in this agrarian text regarded as a practical manual for farm overseers and owners[42]. Scholars highlight the obvious basis this text has in practical experience as shown by its disorganized nature[43].

Varro, a contemporary of Julius Caesar, had a successful political career during his lifetime (116-27 BC)[44]. He was also an extremely prolific writer on topics ranging from history to linguistics and poetry. The *Rerum Rusticarum* is his only work that has survived to modernity in its entirety. This text, written around 37 BC, was a presentation

[41] Elvers – Cato.
[42] Ash – Cato.
[43] Elvers – Cato.
[44] Eck – Varro.

of farming as a realistic way of life[45]. He wrote this tri-part text for his wife to continue successful and profitable cultivation after his death; for Turranius Niger, a cattle breeder; and for other farmers in need of guidance.

Virgil, living from 70-19 BC, seems to have drawn from Cato and Varro's agricultural works for most of the factual farming information in his *Georgics*[46]. As a wealthy author of well-known works such as *The Aeneid* and *The Ecologues*, and writing on the instruction of various prestigious Roman patrons, his direct knowledge of agriculture is not presumed to have been thorough. *The Georgics* was a work commissioned by Maecenas, a wealthy Roman patron, so he is the main audience, but the work also contains instructional passages applicable to a typical Roman farmer[47].

Columella lived in the first century AD in the Spanish province of Baetica. Archaeological evidence suggests that he had a military career that brought him to Tarentum, Italy[48]. His uncle owned a farm in Baetica, but little else is known of his life. This agricultural connection presumably led to his writing of *Rei Rusticae* and *De Arboribus*. There is some evidence that he intended to write on the connection between religion and agriculture, but presumably never did[49]. Columella's writing shows a clear connection to earlier agricultural texts of Cato and Virgil, often contradicting their ideas to differentiate and highlight his own arguments[50].

Pliny, born in 23 AD, earned praise as a successful author and also held various government positions. He wrote numerous historical and grammatical works along with

[45] Eck – Varro.
[46] Elvers – Vergilius.
[47] Ibid.
[48] Ash – Columella.
[49] Christmann – Columella.
[50] Ibid.

his *Naturalis Historia*. Throughout this work he shows great reverence for nature and the gods, drawing agricultural evidence from earlier Greek and Roman agrarian authors.[51] Pliny attempts to portray a complete analysis of the natural world through this extensive work[52].

All of this agrarian writing came out of a period when there was a push toward simpler living. Amidst the extravagance of imperial life, authorities and citizens wrote laws and texts to encourage restraint in diet and lifestyle. This came in the form of agrarian texts and also sumptuary laws. These attempts toward moderation were not always practiced, but simplicity remained an essential Roman ideal. Only limited evidence of sumptuary laws has survived to the modern day but this evidence shows a continual push for increased frugality along with constant opposition.

Macrobius provides the most complete view of the sumptuary laws in his *Saturnalia*. He begins with the Orchian Law, proposed by Gaius Orchius presumably around181 B.C.[53] Due to the great length of the law, Macrobius only states "its main provisions prescribed the permissible number of guests at a meal." This limited the size and therefore extravagance of some meals. After this, the Fannian Law was introduced. This law was unique because it was introduced not by a single leader attempting to limit all of his peers, but by all of the consuls out of the common belief that "extravagant dining was doing unbelievable harm to the State"[54]. The Fannian Law served to "[limit] the permissible expenditure [at a meal] to one hundred asses"[55]. The Didian Law in 143 B.C. expanded the sumptuary laws to all of Italy rather than just Rome as the others had.

[51] Sallmann – Pliny.
[52] Ibid.
[53] Macrobius 3.17.2.
[54] Macrobius 3.17.4.
[55] Macrobius 3.17.5.

It also attempted to reinforce and strengthen the penalties imposed on people who exceeded the previously set laws. The Licinian Law, proposed by Publius Licinius Crassus Dives, bolstered the Fannian Law through reintroduction of fairly similar conditions into law to refresh the idea in Roman minds[56]. Later on, Lepidus and Antius Resto proposed rationing laws that have been lost to us because Macrobius does not elaborate on them.

Macrobius, writing around 410 AD depended on earlier sources for much of his information. He draws much of his information from Aulus Gellius' *The Attic Nights*, a text written in the 2nd century AD about Greek and Roman culture, especially pertaining to literature[57]. Gellius clarifies that the Fannian Law "allowed the expenditure of one hundred asses a day at the Roman and the plebeian games, at the Saturnalia, and on certain other days; of thirty asses on ten additional days each month; but on all other days of only ten." This represents a plausible restriction on Roman life – recognizing the role of extravagance in celebration, but sill emphasizing frugality in everyday life. He also briefly mentions an Aemilian law, which "[set] a limit not on the expense of dinners, but on the kind and quantity of food"[58]. Unfortunately we don't know what types of limitations this would have imposed, but its enactment supports the general theme of restraint. Gellius' representations of the Fannian, Licinian, Sullan, and Julian laws seem to show that they do little more than refresh a sumptuary law when it is being blatantly ignored and to increase the allowable expenditure to keep up with ever-rising standards.

Dio's *Roman History* references the hypocrisy often present in those proposing sumptuary legislation. In telling anecdotes about Seneca he writes, "though he censured

[56] Macrobius 3.17.7.
[57] Rolfe xvi.
[58] Gellius 2.24.

the extravagances of others, he had five hundred tables of citrus wood with legs of ivory, all identically alike, and he served banquets on them… [which implies] the licentiousness in which he indulged"[59]. This highlights the contentious nature of sumptuary legislation and clearly exemplifies why many believed that more laws were continuously needed.

Some sumptuary laws also dealt with moderation of property size. In the time of the Roman Empire, similar to the modern era, large-scale farms were becoming increasingly common. Known as *latifundia*, these farming operations created a continuous demand for slaves, and created further opportunities for rich men to rise in status by owning ever more land – both leading to the increased structural hierarchy of Roman life. Pliny claims that, "it is the wide-spread domains that have been the ruin of Italy"[60].

Both the sumptuary legislation and agrarian texts hearken back to a simpler time when frugality and moderation were practiced extensively. In this ideal, L. Quinctius Cincinnatus is regarded as a model Roman citizen for his military and farming accomplishments. He was further admired in his role of farmer-dictator for his willingness to relinquish power after his military tasks were done and he chose to return to his farm[61]. Cincinnatus, along with Gaius Fabricius and Curius Dentatus were highly praised for embodying the duality of successful farmer and military leader[62]. Not only did all of these men relinquish highly prestigious positions of power, they also made a humble living on a small plot of land afterward – the diametric opposite of *latifundia*. Cincinnatus is said to have "upheld the dignity of his family" on only three iugera of

[59] Dio 61.10.3.
[60] Pliny 18.7.
[61] Columella I.13.
[62] Ibid.

land[63]. Dentatus even refused 50 iugera of land in exchange for a meager seven iugera, the same amount allotted to any other citizen[64]. Gnaeus Tremelius Scrofa and Gaius Licinius Stolo also exemplify ideal Roman farmers. Varro bestows Scrofa and Stolo with obvious praise in his characterization of them in his *De Agricultura*, and he further mentions his respect for the beauty of Scrofa's farm, and the frugality and quality of Stolo's[65].

The role of these men in recorded history aptly shows the honor and prestige with which farming was heralded. Columella elaborates, "that true stock of Romulus, practiced in constant hunting and no less in toiling in the fields was distinguished by the greatest physical strength and, hardened by the labors of peace, easily endured the hardships of war when occasion demanded"[66]. Additionally, early Romans were said to have used the term "good farmer" as a comment of highest praise and also respected the temperament of farmers in their transition to brave and confident soldiers[67]. Varro's praise continues that agriculture "is not only an art but an important and noble art"[68]. This statement grants farmers status closer to that of artists than peasants.

Resourcefulness and profitability were also idealized among ancient agrarian writers in opposition to the extravagance of the imperial era. Varro elaborates that, "a farm is undoubtedly more profitable… if you construct [the buildings] more according to the thrift of the ancients than the luxury of the moderns"[69]. Pliny, in his renouncement of large-scale farms praises ancient ideals and appeals to his audience to "let moderation

[63] Valerius Maximus 4.4.6-7.
[64] Columella I.III.10.
[65] Varro I.II.9.
[66] Columella I.17.
[67] Cato preface 2-3.
[68] Varro I.III.
[69] Varro I.XIII.6.

guide our judgment in all things"[70]. Varro also speaks ill of large, extravagant villas that use more resources than truly necessary, or more land than is needed for adequate pasturage[71]. This moderation applies to resource use and results in personal gain through frugality as well as general well-being in the future when these resources are not depleted.

A difference in those who actually performed the agricultural work distinguishes ancient agriculture as portrayed in agrarian texts with modern agricultural practices but the underlying message and practices which are key to sustainability still exist. Modern farming is generally undertaken by those who own the land, further supplemented by hired hands and machines. Conventionally, a complex framework of seed and mechanization corporations backs these farmers, whereas those practicing sustainable agriculture tend to have less extensive, large-scale backing. Ancient farming was managed by hired overseers while the landowner held only a small role in terms of labor and management. The labor that is today performed by tractors and other machinery required large amounts of slave labor in Ancient Rome.

In the opinion of agrarian writers, overseers were ineffective stewards of the land and needed supervision by landowners to maintain viability of the land and profitability of farming operations[72]. The overseer's role was not well regarded because it was composed of extremely varying tasks and he often received fewer rations than the general laborers [73]. The overseer was responsible for managing the accounts, laborers, and operations of the farm honestly and effectively. These tasks had to be done without

[70] Pliny 18.7.
[71] Varro III.II.
[72] Columella I.II.2.
[73] Cato LVI.

subverting the master otherwise the overseer would be subjected to punishment[74]. For that reason, these texts were often written to inform an otherwise ignorant landowner of what should be happening on the farm to determine whether his overseer was capable or trustworthy. In an attempt to help the landowner seem knowledgeable and authoritative, Cato provides lists of specific tasks that can be suggested to an otherwise unproductive overseer[75]. Cato also suggests giving the overseer written directions of what must be done on the farm, while Varro advises having literate and knowledgeable men managing the slaves[76]. This illustrates a lack of trust on the part of farm owners in their hired overseers, but further indicates that overseers may also have been literate and lends credence to the idea that the audience of these texts may be more than just masters of farms[77]. These writings would have been useful for farm owners to keep track of the progress of their overseer, but could have been useful as well for literate overseers to increase their farming knowledge. They generally apply to specific practices that need to be undertaken, as well as the management of workers and slaves.

Slavery became more prevalent in agriculture as time progressed. Cato (living 243-149 BC) makes very little mention of slaves except as a supplement to hired workers and under the jurisdiction of the overseer[78]. Varro, writing more that 100 years later, describes the integral role of slaves in agriculture. He advocates treating slaves well, not using whips as punishment and allowing them to establish personal connections to the land and master by settling nearby or "being treated more liberally in respect either of

[74] Cato V.
[75] Ibid.
[76] Cato V, Varro I.XVII.
[77] Cato II.
[78] Cato V.

food, or of more clothing, or of exemption from work"[79]. The increased usage and mention of slaves mirrors timeline for the rise of large-scale farms and suggests the need for more labor at a low cost. Though Varro acknowledges the importance of slaves, he categorizes them as equipment needed for farming operations. This categorization is slightly above that of the 'inarticulate equipment' of cattle, and the mute equipment consisting of "baskets, jars and the like," referencing their role only as laborers[80]. Columella describes the extent of slavery needed to perform all necessary tasks on farms of various sizes. Columella maintains a fairly high opinion of slaves and believes in positive reinforcement to encourage good behavior and quality work[81]. He even recognizes that "their unending toil was lightened by … friendliness on the part of the master"[82]. This recognition of humanity towards ones slaves was not a complete rejection of punishment as Columella also describes chained and shackled slaves who had done wrong. In his writing, Columella also considered the physical and mental capacities of various workers and listed tasks best suited for each build and temperament[83].

Gods were also thought to hold an undeniable role in the success or failure of a crop. Columella viewed perennial fertility as a god-given right, but most other authors believed practices were necessary to appease the gods and make them amenable to the cause of helping to grow successful crops. The role of honoring the gods, generally left to the farm overseer, was indispensable and was meant to maintain favor from the gods. Virgil sings praises to various and many gods for the benefit of specific crops or practices. Praises and sacrifice for Ceres are elaborated and she is especially hearkened

[79] Varro I.XVII.
[80] Varro I. XVII; I. XXII.
[81] Columella II. VIII.
[82] Columella II. VIII. 15.
[83] Columella II. IX.

for her importance in teaching man the use of the plow[84]. Varro elaborates on the 12-herdsmen gods relevant to agriculture as follows:

> "First, then, I invoke Jupiter and Tellus, who, by means of the sky and the earth, embrace all the fruits of agriculture; and hence, as we are told that they are the universal parents, Jupiter is called "the Father," and Tellus is called "Mother Earth." And second, Sol and Luna, whose courses are watched in all matters of the planting and harvesting. Third, Ceres and Liber, because their fruits are most necessary for life; for it is by their favour that food and drink come from the farm. Fourth, Rogibus and Flor; for when they are propitious the rust will not harm the grain and the trees, and they will not fail to bloom in their season; ... Likewise I beseech Minerva and Venus, of whom the one protects the oliveyard and the other the garden; ... And I shall not fail to pray also to Lympha and Bonus Eventus, since without moisture all tilling of the ground is parched and barren, and without success and "good issue" it is not tillage but vexation."[85]

These gods all held obvious importance to various aspects of farming. Along with specific farming practices undertaken to maintain land fertility, ancient agrarians believed praises and sacrifices to the gods brought about conditions under which plants could grow.

These differences between modern and ancient agricultural conventions highlight practical variances, but do not undermine the commonality of an underlying ideal of sustainability.

[84] Virgil I. 338-350.
[85] Varro I.I.5-7.

Chapter 3: Sustainability in Ancient Rome

Roman agrarian writers recognized the need for sustainable agriculture to protect the fertility of their fields. Toward this end, farmers devised various practices to combat soil deterioration. Many of the practices described by these agrarian writers can be directly correlated with sustainable practices used today. This sustainability is based primarily in knowledge of growing conditions and how to preserve them. In practice, this occurs through adaptation to the place where farming occurs, use of already occurring interconnected relationships, and recognition of the complex time-scale. The end goal of using these practices is continued land fertility.

Columella recognized that plant growth is affected by place, season and weather[86]. Observing the knowledge that agrarian writers had of these three areas reveals the factors they saw as necessary to plant growth.

Roman agrarians were very knowledgeable about the effects of location and soil types on plant growth. Columella emphasizes the impact that terrain has on crop production as well. In *champaign* (sloping), hilly, and mountainous regions very different types of plants will thrive. The soils of these regions are equally important and must be examined. Columella defines three dichotomous types of soils that can occur in conjunction with each other – fat or lean, loose or compact, and moist or dry[87]. Similarly, Varro highlights the necessity of recognizing the "conformation of the land, the quality of the soil, its extent, and in what way it is naturally protected"[88]. These factors are integral to creating a basis of knowledge and undertaking farming practices specific to the unique qualities of the land. In further describing the quality of the soil, Varro develops a tri-part

[86] Columella II.VII.2.
[87] Columella II.II.5.
[88] Varro I.VI.1.

categorization with poor, medium, or rich soils as the primary types. These simple categories can be divided according to their extent of rockiness, moistness, or loaminess[89]. In knowing the characteristics of the different combinations of types of soils and land conformations, a farmer can best determine what crops will most successfully grow in a given location.

Varro describes an ideal soil as dark in color, "crumbling easily when it is dug, of a consistency not ashy and not excessively heavy," and producing abundant natural vegetation without cultivation.[90] As Columella recognized though, the dark color of a soil is not the defining characteristic of good land – it must also taste sweet[91]. In defining quality land, Virgil, Varro, and Columella all categorize types of soils and correlate them with particular crops that thrive in those conditions. Virgil primarily distinguishes between well-aerated and dense soils. The former are well suited for vineyards or grazing meadows, while the latter requires heavy tilling before it will bear crops[92]. A rich, fertile soil in Virgil's view is one that has enough internal structure to be sticky and moldable. A soil that crumbles when it is picked up is viewed as inferior[93]. As all characteristics except for density can be easily remedied or modified by farming practices, Columella, like Virgil, highlights the density of soil as a primary indicator of its characteristics[94]. He outlines various tests that a farmer can do to determine the quality of the soil, which are very similar to modern field tests. Columella goes so far as to describe the proper methods of tasting soils to determine their qualities[95].

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[89] Varro I.IX.
[90] Varro I.IX.7.
[91] Columella II.II.16.
[92] Virgil II.230.
[93] Virgil II.225.
[94] Columella II.II.4.
[95] Columella II.II.20.

In accordance with Columella's classification of place, season, and weather, farmers must also have knowledge about the seasons. In a basic observation of seasonal changes, Virgil describes the transition from summer to autumn, "as the day now grows shorter and summer softer"[96]. Varro determines seasonality of farming operations both by the sun and the moon, relating to changing star patterns as well[97]. As Columella astutely recognizes though, "[a farmer] must observe the behaviour of the current weather and season, for they do not always wear the same habit as if according to a fixed rule; summer and winter do not come every year with the same countenance; the spring is not always rainy or the autumn moist"[98]. This highlights the relationship between seasons and weather and the need for adequate knowledge of both for successful farming.

The weather is largely dependant on the season, but still varies greatly day to day. Virgil likewise made praises "for moist summers and sunny winters," because they create conditions most amenable to plant growth and large harvests[99]. Though rains and weather patterns are necessary, Virgil warns against "the heat, and the rain, and the cold-bringing winds," for their possibility of inflicting damage on crops[100]. Pliny repeats this common realization in his warnings against the storm or tempest[101]. Virgil encourages the observation of the actions of animals to determine if a storm may be particularly strong, as certain animals will act in specific ways that can be taken as a warning[102]. Severe weather could have as much of a detrimental effect on a farm as a band of

[96] Virgil I. 311.
[97] Varro I.xxvii.
[98] Columella I.23.
[99] Virgil I.100.
[100] Virgil I. 350.
[101] Pliny 19.1.
[102] Virgil I.380.

robbers, so farmers must take caution in planting and building[103]. Provisions against harm by severe weather can only really be taken in terms of farm layout and protecting the most vulnerable areas from where the harshest winds come. As Virgil specifies, "be it first our care to learn the winds and the wavering moods of the sky"[104]. In Ancient Rome, the directionality of winds had great significance in their supposed ability to bring healthful or sickening air[105]. This consideration was often taken into account in the layout of a homestead. As Varro suggests, a house should be situated toward the east so that, "it has the shade in summer and the sun in winter"[106].

Ancient agrarians recognized, just as we do now, that harvesting crops from the land inherently takes away part of its fertility. As Saserna believed, and Columella transcribed, "land is fertilized and improved by some, and, on the other hand, is burned out and wasted by others"[107]. The connection between plants and renewing soil is supported by the arguments of Columella and Cato. Both of these authors knew that legumes were generally beneficial to the land[108]. In modern times it is recognized that these plants have the unique quality of "fixing" nitrogen (an essential nutrient for practically all plant growth) from the air and adding it to the soil. Cato claims, "crops which fertilize land [are] lupines, beans, and vetch," while Columella lists such plants as medic clover, vetch, and lupine as simply "improving the soil"[109]. Likewise, Varro says that, "land ought to be left every other year with somewhat lighter crops… I mean by that

[103] Varro I.XII.4, Columella I.VII.1.
[104] Virgil I. 51.
[105] Varro I.IV.5.
[106] Varro I.XII.
[107] Columella II.XIII.
[108] These authors do not define legumes as being beneficial to the land, but rather harmful. The specific plants they describe are today regarded as legumes, and in sustainable agriculture it is recognized that legumes provide beneficial soil nutrients. Interestingly, these texts specifically call plants that are especially degrading to the soil legumes.
[109] Cato XXXVII, Columella II.X.25.

crops which are less exhausting to the land"[110]. This allows the soil time to recover after exhausting crops and suggests the use of crop rotations.

The incredible strength of this land and plant connection is exemplified in the following statement by Columella:

> If the farmer is destitute of everything, at any rate there is no lack of lupine, that very ready aid; and if he will scatter this on lean ground about the middle of September, plough it in, and at the proper time cut it up with the ploughshare or the mattock, it will have the effect of the best manure[111].

This shows the resourceful nature that ancient farming required, but also the importance of knowledge in order to farm most effectively. Many authors described the use of plant or manure based fertilizer in addition to crop rotations. Columella supported the use of any fertilizer in saying, "it is the mark of a slothful husbandman to be destitute of fertilizer. For he may store up any sort of leaves; he may gather any accumulated matter from bramble patches and from highways and byways," to fertilize his own fields[112].

Similarly, manure was recognized as another extremely valuable method of renewing the fertility of land that had been exhausted. Columella supports the use of manure, "for all ground that is exhausted by cropping the aforesaid legumes there is one remedy at hand, namely, to come to its aid with manure, and with this sustenance, so to speak, to restore the strength that has been taken from it"[113]. This connection was not accepted by all agrarian writers, but the need for animal labor as well as manure constituted a key argument for the conjunction of herding and agriculture. As Varro explicitly argues, "[cattle] enhance the cultivation of the land by their labor, such as those which can plough under the yoke… how can cattle be kept off the land, when manure,

[110] Varro I.XLIV.3.
[111] Columella II.XV.5.
[112] Columella II.XIV.6.
[113] Columella II.XIII.3, again a differing modern and ancient definition of legume.

which enhances its value very greatly, is supplied by the herds?"[114]. Animals were used as labor to grow crops and their manure was utilized in cropland fertilization and renewal. Varro categorizes the type of draught animals necessary to work different types of land, citing oxen or donkeys to plow the land and haul carts. There is some contention among ancient agrarian writers though, regarding the best animal for manure[115]. As Cassius claims, the manure of birds is best, "because it has the most heat and causes the ground to ferment"[116]. Varro agrees and states, "the best dung is from aviaries of thrushes and blackbirds," justifying and supporting the presence of aviaries on farms[117]. Additionally, Columella supports the praiseworthy qualities of bird dung. He places human excrement and cattle manure as secondary but still incredibly useful in fertilization[118]. In Cassius' hierarchy of manure quality, he continues,

> "that next to pigeon dung human excrement is the best, and in the third place goat, sheep, and ass dung; that horse dung is least valuable, but good on grain land; for on meadows it is the most valuable of all, as is that of all draught animals which feed on barley, because it produces a quantity of grass"[119].

This final argument is contrary to most uses of manure precisely because of the weed seeds present in fresh manure and its potential to spread and encourage weed growth but relevant in its use on meadows which are composed entirely of plants that would otherwise be considered weeds.

In a typical modern and ancient setting, manure is aged so that these seeds will be killed. Varro and Columella both encourage this action in developing manure pits where it can age and be rotated periodically, "for manure is not so good when it is put in fresh as

[114] Varro I.II.20.
[115] Varro I.XIX-XX.
[116] Varro I.XXXVIII.
[117] Ibid.
[118] Columella II.XIV.
[119] Varro I.XXXVIII.

when it is well rotted"[120]. Columella elaborates on this ideal and shows an understanding of not only the processes of aging but also its rationale, "for it is most important that manure shall retain its strength with no drying out of its moisture and that it be soaked constantly with liquids, so that any seeds of bramble or grass that are mixed in the straw or chaff shall decay, and not be carried out to the field to fill the crops with weeds"[121]. Columella also recognizes that manure is naturally warm, an observation supported and necessitated in the fermenting process, though he attributes it to a more philosophical nature of cold land needing warmth from manure[122].

Restorative relationships are created in the interactions between plants and soil, and between animals and soil. Additionally, the interconnectedness of the farmer and soil is an essential facet of sustainable agriculture for the emotional and intellectual bond it can foster. This is exemplified by the care a farmer shows for the preservation of the land if he has developed an emotional connection to that specific place. As shown in chapter two, small-scale farming and moderation are essential Roman citizen ideals perpetuated through literature and stories. These ideals integrate the humility and work ethic present in fable. Agrarian authors often acknowledged the hard work farming requires. Pliny states, "agriculture, in fact, depends upon the expenditure of labour and exertion"[123]. On large farms, slaves likely did much of this actual labor, but those who opposed *latifundia*, like the farmers of fable, would have had to expend their own labor. Likewise, Columella highlights that knowledge, money, and the willingness to work hard

[120] Varro I.XIII.4.
[121] Columella I.VI.21.
[122] Columella I.XV.3.
[123] Pliny 18-8.

are necessary to have a successful farming operation[124]. As "continuous cultivation by previous owners," is a good quality for a farm to have, Pliny recommends judging the salubrity of the land by its inhabitants[125]. Moderation, too, is encouraged so as to enable a farmer to have an emotional and knowledge-based connection with all of his land. As Columella states, "measure and proportion must be applied to all things," and Cato continues, "that the land should not be elaborate"[126]. This restraint ideally allows farmers the opportunity to connect fully with all of their land.

In another method for farmers to connect deeply to their land, agrarian authors encouraged experimentation in agriculture. Experimentation is integral to sustainable agriculture because it encourages plants to adapt to their natural surroundings, promoting diversity and the plants' success with minimal human intervention. While others suggest copying the practices of neighbors to learn what practices work in the region, Varro recognizes that "nature has given us two routes to agriculture, experiment and imitation"[127]. This exemplifies the experimental nature of sustainable agriculture as it can develop complex relationships between the farmer and the intricacies of his land. Another strong connection to modern sustainable agricultural practices comes in the encouragement to build slowly and thoughtfully. Cato and Varro both outline thoughtful layouts of the land and buildings for optimal longevity. This emphasis on durability rather than mere immediacy is consistent with the timeline of sustainable agriculture.

As a specific, time driven example of agricultural experimentation, ancient agrarians practiced seed saving. Varro emphasized taking care of stored seeds to retain

[124] Columella I.I.
[125] Pliny 18-6.
[126] Columella I.III.8, Cato Introduction.
[127] Varro I.XIII.

their viability for planting the next year. They must not be too dried out, kept clean, and not mixed with seeds of similar appearance[128]. These seeds were "discovered in the experiments of the farmer," presumably meaning they were propagated and saved for their desirable characteristics[129]. This experimental nature, as earlier expressed, is an integral facet of sustainable agriculture. Columella elaborates on this artificial selection in encouraging farmers to save the best seeds from the best plants for sowing in the next year[130]. While this may have seemed like an obvious and necessary action for ancient farmers to take, it can be viewed today as hearkening to a sustainable agricultural system that has specific connections to the place where it exists, and is developed to maintain the fertility of the land.

Modern sustainable agriculture encourages the seasonal use of the land, as did ancient agriculture. This seasonality was determined both by the sun and the moon. Varro lists specific practices that should be undertaken at many explicit times, dividing the year into its seasons based on equinoxes and solstices, and then further in half by specific star patterns[131]. The moon's impact can show a superstitious nature as shown by Varro's advice not to shear sheep during a waxing moon for fear of their losing their hair[132]. Seasonality based on the sun and star patterns is much more obvious to us for the clear variations they cause or indicate in temperature and daylight hours. For every crop grown, the proper planting, care, and harvest times must be known, and many are listed by Varro, Virgil, and Columella.

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[128] Varro I.XL.2.
[129] Ibid.
[130] Columella II.IX.11.
[131] Varro I.XXVI-XXVII.
[132] Varro I.XXXVII.

The cropping and planting timeline of ancient farms is similar to a modern sustainable agricultural crop rotation. Tilling, recently recognized as problematic for destroying the naturally occurring soil structure, was lauded for its necessity in ancient times. Virgil even encouraged tilling land three or four times a year[133]. Whether farmers followed this advice or not is unknown, but they almost certainly plowed before planting began each year. Cato may be encouraging double cropping a field, in sowing it first for forage and then planting another crop[134]. This could alternately be interpreted as crop rotation between years, but in any case provides a logical progression of cropping. The forage ("clover, vetch, fenugreek, beans, and bitter-vetch") first fixes the nitrogen in the soil, and allows for a more exhausting crop to be successful when planted there afterward[135]. After planting barley, Columella suggests, "it is best to let the ground lie fallow for a year, or if not, to saturate it with manure and drive out all the poison that still remains in the land"[136]. Allowing the land to lay fallow or thoroughly manuring it helps restore the nutrients lost through harvest. An exhausted land may be confused with or possibly alternatively called poisoned.

Another land concern in ancient times, which persists in the modern day, is soil erosion. Columella drew attention to the possibility of erosion in uncropped fields, and suggested only gently irrigating land until the roots were developed enough to retain the soils. He states, "in loose soil it is not wise to let in too heavy a flow of water before the ground is packed and bound together by vegetation because the force of the water washes

[133] Virgil II.395.
[134] Cato XXVII.
[135] Ibid.
[136] Columella II.IX.15.

away the soils"[137]. The loss of topsoil, a major concern, highlights the necessity of fertile soils for plant growth.

As shown in all of these examples, soil fertility was recognized in ancient times as supremely important to growing successful crops and remains so today. Maintaining this fertility through knowledge and practice constitutes the core of sustainable agriculture.

[137] Columella II.XVIII.5.

Conclusion

Ancient agrarian texts suggest that sustainable agriculture was practiced in Ancient Rome much as sustainability is defined in the modern era. This is defined through a general recognition of the importance of maintaining soil fertility. The specific ideals, knowledge, and practices undertaken in ancient and modern farming and literature further support the application of sustainable agriculture discourse in ancient Roman agrarian text.

The modern discourse of sustainable agriculture relates land quality with successful plant growth and also with improvement of the society as a whole. Sustainability promotes a holistic view of life and agriculture, so farmers must inherently be kind to the land in order to preserve the conditions necessary for growth. Knowledge is seminal to this end, for a basic understanding of natural processes is essential in order to preserve them. Sustainable agricultural knowledge is largely drawn from cultural capital; from the collective knowledge gained by the society through farming experience over time.

Ancient Roman agrarian texts can be viewed as the passage of Roman agricultural knowledge on to future farmers. This knowledge and the utilization of the sustainable practices described in the texts allows for continual cultivation on fertile land. The concurrent emphasis on frugality and moderation expressed in laws and fable provide a cultural basis for this care for the land. The Roman knowledge expressed in these agrarian texts of conditions that affect plant growth and practices suggested to remediate the soil connote a clear implication of sustainable agriculture in Ancient Rome.

Though the discourse applies, there is only one instance in these agrarian texts where the term "sustainable" could grammatically apply. In the Loeb Classical Library translation of Varro's *Rerum Rusticarum* he states, "The Italian seems to have had two things particularly in view in his farming: whether the land would yield a fair return for the investment in money and labor, and whether the situation was healthful or not"[138]. Here the Latin *saluber, salubris* is translated as 'healthful'. The Oxford Latin Dictionary defines this term as "conducive to a better condition or situation, salutary, beneficial"[139]. In light of the connection between sustainable agriculture and ancient agrarian texts, I propose that this term can also be translated as "sustainable" making the passage read, "…whether the situation was sustainable or not." This better reflects the meaning of the passage and the underlying message of the text itself.

This text, along with all of the other extant agrarian texts reflect a basis in sustainable agriculture, but it is nearly impossible to determine from this evidence to what degree these practices were actually undertaken by Roman farmers. Some question exists as to the extent of these practices and suggests that a decline in agriculture itself actually contributed to the decline of Rome[140]. Later in the Roman Empire, many farmers left their land on the Italian peninsula due to an inability to make a living on it anymore and creating *agri deserti* or deserted fields[141]. The inability to live off the land is variously blamed on mistreatment of nature and low prices for crops, both placing the

[138] Varro I.II.8.
[139] Glare 1683.
[140] Hillel 107.
[141] Krause.

farmer in a position in which he cannot grow enough and make an adequate profit to continue farming operations and pay taxes[142].

This argument does not undermine the existing evidence for agrarian texts supporting sustainable agricultural practices. In fact, this situation strengthens the connection between modern and ancient agriculture and the need for sustainability. The ancient agrarian texts may suggest a dated, but successful practice usurped by low profit margins, *latifundia*, and unsustainable practices – a striking parallel to our modern circumstances. This serves as a warning for the industrial agricultural system. Technological advancements allow unsustainable practices to continue in the modern day, but proponents of sustainable agriculture cite the damaging effects these advancements have on social and ecological conditions for generations to come.

Sustainable agriculture has its basis in ancient and time-honed processes, but its discourse has only arisen in the recent past. Ancient Roman agrarian texts provide an exemplary basis for examining sustainable practices that existed more than two millennia ago.

[142] Logan 166, Hillel 106.

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