8-2019

Regional Variation in Grass, Sedge, and Cereal Cultivation During the Viking Age in Skagafjörður, North Iceland

Melissa M. Ritchey

REGIONAL VARIATION IN GRASS, SEDGE, AND CEREAL CULTIVATION DURING THE VIKING AGE IN SKAGAFJÖRÐUR, NORTH ICELAND

A Thesis Presented

by

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Submitted to the Office of Graduate Studies,
University of Massachusetts Boston,
in partial fulfillment of the requirements for the degree of

MASTER OF ARTS

August 2019

Historical Archaeology Program

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ABSTRACT

REGIONAL VARIATION IN GRASS, SEDGE, AND CEREAL CULTIVATION DURING THE VIKING AGE IN SKAGAFJÖRÐUR, NORTH ICELAND

August 2019

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In Viking Age and Medieval Iceland, livestock forage was a critical resource in the Norse agropastoral economy. Cereal cultivation, typically an important part of the Norse economy, may have been more limited in marginal sub-Arctic Iceland. An analysis of macrobotanical seed assemblages from archaeological excavations at 42 Viking Age and Medieval farmsteads in the Skagafjörður region of North Iceland suggests both broad trends and substantial variation over time and space in agropastoral production practices. This study finds that the main components of livestock forage (grass, sedge, and perhaps cereal) are highly variable between regions and over time. Interestingly, barley (*Hordeum* *vulgare*) cereal grains are remarkably ubiquitous across farmsteads of varying size and status during the Viking Age, but are absent in Medieval deposits. In some regions, farmers seem to have been emphasizing marsh and wetland resources, resulting in greater sedge (Cyperaceae) seed presence, while grass (Poaceae), seeds dominate the assemblage at other farmsteads. Case studies of two farmsteads are presented, which characterize the variability between farms during the Viking Age. The variation in the basic and robust agropastoral package of grass and sedge forage and barley cultivation recovered from paleoethnobotanical samples of domestic midden deposits—along with possible oat utilization—point to the Norse farmers' versatility in farm management and subsistence strategies during the chiefly settlement and medieval manorial consolidation of Iceland.

ACKNOWLEDGEMENTS

There were many people and institutions that contributed to the work in this thesis and made this research possible. An endless amount of thanks are due to my committee and mentors for their unfailing guidance, honesty, critiques and faith in my work: John Steinberg, Heather Trigg and Douglas Bolender. Thank you to the over 100 people who have worked on the SCASS and SASS projects over the years and have been invaluable to this project, including: Guðný Zoëga, Brian Damiata, Rita Shepard, John Schoenfelder, Kathryn Caitlin, CeeCee Cesario, and Eric Johnson. Special thanks go to Kathryn Caitlin and CeeCee Cesario for their excavation and research on the two case study sites.

Thank you to the students from UMass Boston who contributed their time and effort each field season in Iceland and each school year in the lab. A special thanks goes to Grace Bello for her unfailing joy, encouragement and reality checks throughout this entire process. Thanks to both Grace and Lauryn Welch O'Connor for spending long hours at the floatation machine with me, rain or shine. Many thanks to the Skagafjörður Heritage Museum and the Icelandic farmers, for their unending support for the SCASS project and enthusiasm in our work. I am also indebted to my family for the constant support and instilling in me an appreciation for history and the confidence to follow a research driven career.

Additional recognition and thanks to those who built the floatation machine and figured out sampling and floatation protocol in the early days of the project: Marisa

Diane Patalano, Katherine Johnson, Heather Trigg, Susan Ann Jacobucci and the welder Hjörtur, from Vélaverkstæði Kaupfélag Skagfirðinga who created a machine that has lasted 18 years of use and love. Thank you to both Heather Trigg and Virginia Popper for the guidance and assistance in seed identification. Thank you to the Graduate Student Assembly for the award of the Dr. Robert W. Spayne Research Grant that made the exploration of possible oat cultivation possible.

General permits for the survey of Hegranes as part of the Skagafjörður Church and Settlement Survey (SCASS) and associated excavations were granted by the Cultural Heritage Agency of Iceland (MÍ201506-0056, MÍ201506-0058, MÍ201506-0059, MÍ201606-0051, & MÍ201606-0030). The National Museum Research number for this work (and for most of Hegranes) is 2017-19. The work was supported by the US National Science Foundation (PLR # 1242829, 1345066, 1417772 & 1523025) in a joint project of the Skagafjörður Heritage Museum and UMass Boston. The Icelandic Archaeology Fund also supplied significant support for the project. We are grateful to the Skagafjörður Commune for their ongoing and invaluable support.

The Skagafjörður Archaeological Settlement Survey (SASS) was funded by the US National Science Foundation (BCS # 9908836, 0107413, 0453892, 0731371, ARC # 0909393) and the Wenner-Gren Fund for Anthropological Research. This work was done in conjunction with Sigríður Sigurðardóttir and Guðný Zoëga of Byggðasafn Skagfirðinga Glaumbæ, Ragnheiður Traustadóttir of the Hólar Research Project. The SASS project operated under permits granted by Þjóðminjasafn Íslands & Fornleifavernd ríkisins. Tephrachronology was conducted by Magnús Á. Sigurgeirsson. Guðmundur Ólafsson assisted with the excavation at Glaumbær. John Schoenfielder was responsible for all mapping. Rita Shepard was responsible for the test-pitting program. Landowner permission was obtained with the assistance of Hjalti Pálsson.

Any opinions, findings, conclusions, or recommendations expressed in this material are those of the author and do not necessarily reflect the views of the individuals and institutions who support this work. Products or instruments mentioned should not be construed as an endorsement.

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CHAPTER 1

INTRODUCTION

The arrival of Norse settlers in Iceland about 870 AD, signified a major transition in the ecological condition of the uninhabited island and tested the adaptive capability of humans in a new environment. The success of the early Norse settlers in Iceland relied on their ability to modify the package of Scandinavian subsistence strategies to their new Icelandic environment. Descriptions of one of the first Icelandic settlers suggests that, from the beginning of the settlement, hay foddering was of critical importance to sustaining Norse society. The story of Floki Vilgerdarson and his crew is recounted in the *Landnámabók* (Pálsson and Edwards 1972:18). The saga describes how Floki's crew was too preoccupied by fishing in Vatnsfjord, when they first arrived, that they "forgot to make hay and thus their livestock starved to death the following winter" (Pálsson and Edwards 1972:18). Partially because of this experience, Floki called this North Atlantic volcanic island, Iceland.

This thesis examines the adaptive capability and versatility of agropastoral practices of farmers on two landforms in the Skagafjörður region in Northern Iceland. Other research in the North Atlantic has documented the surprising variation in adaptive strategies employed by the Norseman as they colonized new, marginal territories (Smith 1995; Adderley and Simpson 2005; Arge et al. 2005; Adderley et al. 2008; Dugmore et al. 2012). Along those lines, this thesis seeks to understand the versatility of Icelandic farmers in their agropastoral production practices. Specifically, it seeks to understand how Viking Age and medieval Icelandic farmers differed in their utilization of flora in cereal production and livestock foraging.

This project uses macrobotanical data recovered over the course of the 18-year, NSF-funded Skagafjörður Church and Settlement Survey (SCASS), as well as the proceeding Skagafjörður Archaeological Settlement Survey (SASS). As part of the project's regional analysis, a systematic sampling of farmstead midden deposits on two landforms, Hegranes and Langholt, in Skagafjörður, recovered macrobotanical remains from a majority of Viking Age farmsteads in the study area. These remains culminated in approximately 753,457 seeds from 1,061 samples gathered from 42 farmsteads. Identification of seed remains was conducted over the course of the project. As part of this broader research, I assisted in excavation, sampling and processing of the macrobotanical remains from two field seasons (2017-2018) and confirmed identification of all cereal grains and the majority of all other taxa recovered from the previous excavations.

The term farmstead is used to describe the centralized location of the farm which includes the farm buildings (longhouse, barn, ancillary structures) and the house midden (Steinberg et al. 2016). The seeds that are the focus of this study were recovered from these farmstead middens and represent the domestic and agricultural activities of the farm. The farmsteads represent located and sampled individual Viking Age farm mounds (not the modern farms), determined by the presence of archaeological features such as turf structures and substantial midden deposits (peat ash, charcoal ash, faunal remains) (Steinberg et al. 2016). One modern farm, such as Helluland (farm number 447) could have multiple Viking

Age farms (sites). The main, modern farms are labelled XXX-X, i.e. 447-0, and surrounding sites number sequentially, i.e. 447-1, 447-2, 447-3. These farm numbers and names are determined from an 19th century land survey, *Jarðatal á Íslandi* (Johnsen 1847).

The term *livestock forage* (or simply *forage*) is used in this thesis to describe the practice of cutting and gathering hay for livestock fodder from improved agricultural fields as well as outfields and meadows, as well as the practice of livestock grazing directly on fields, meadows, and on unimproved distant communal lands.

Barley (*Hordeum vulgare*) was a significant crop to early Icelandic society (Zutter 1992; Hermannsson 1993; Erlendsson, Edwards, and Buckland 2009b). Long understood as the only cereal grain that could be cultivated in such an environmentally marginal landscape due to its climatic tolerance, barley cultivation was and is still heavily restricted by the Icelandic climate. Barley is rarely found later than the Viking Age in northern Iceland (Zutter 1999; Sveinbjarnardóttir et al. 2007; Erlendsson, Edwards, and Buckland 2009a; Guðmundsson and Hillman 2012; Mooney 2017). This restriction, and barley's association with ceremonial feasting which help sustain early Iceland's chiefly political economy, has supported the interpretation of barley as a prestige good associated with high status (Zori et al. 2013; Riddell et al. 2017). However, preliminary research conducted on the cereal grains from Langholt farms (one farm's assemblage is discussed in Trigg et al. 2009), suggests that barley ubiquity is not idiosyncratic but can be present across site types and regions. This, along with new data from Hegranes presented in this thesis demonstrates barley is recovered regularly in midden deposits of sites of varying size and status. This thesis argues that barley production and consumption was not limited to farms of high status and may have been far less restricted than previously imagined.

As part of the lab analyses for this thesis, possible oat grains (cf. *Avena)* were identified from two sites excavated in the 2017 field season. The high number of oats grains from one site was a surprise finding that led to further excavation with the goal of recovering a more robust sample from these two sites. The possibility of another productive strategy in Iceland, oat cultivation, became an integral part of this thesis' goal of understanding the variation of Viking Age farmers' subsistence strategies.

Additionally, the analyses found that the one taxon– Poaceae (grass)– the base of the Norse Icelandic economy, is in fact the most significantly variable taxa. Grass cultivation and harvesting is at the core of the animal foraging practices that sustained Icelandic agropastoral activities until the 19th century (Fridriksson 1972; Amorosi et al. 1996). Statistical analyses show that grass presence varies significantly between Langholt and Hegranes and over time – from the Viking to Medieval Age. Thus, this thesis argues that Hegranes farmers were potentially compensating for a lack of grasslands by increasing their utilization of sedge forage sources.

The variation in farm production strategies during the Viking Age seems to be a contributing factor in the long-term stability of the chiefly political economy. A noticed reduction in seed deposits during the Medieval Age may indicate a decline in productivity as a consolidated, manorial socio-political and economic system overtook the island.

CHAPTER 2

ENVIRONMENTAL AND SOCIAL CONTEXTS

Iceland is located just south of the Arctic Circle, between latitudes 63°23' N and 66°32' N and longitudes 13°30' W and 24°32' W. The island was permanently settled by the second half of the 9th century AD, during the initial settlement or *landnám* ("land-take") . These early Icelandic settlers brought with them their subsistence suite of wild resource exploitation, animal husbandry and agriculture to an uninhabited and forested island. A period of volcanic eruptions, rapid human-caused deforestation and subsequent erosion followed the *landnám* that changed the Icelandic landscape into what we see today – mountainous barren inlands, highland grasslands, and lowland home fields around homesteads (McGovern et al. 1988; Ingimundarson 1995; Smith 1995; Þorgilsson and Grønlie 2006:4; Ingimundarson 2008).

Iceland was settled during a period of relative warmth, in comparison to the later Little Ice Age (approximately 1400 to 1900 A.D.) – one of the coldest periods in the past 12,000 years (Bradley et al. 2003). In this comparatively warm period, the new Icelandic settlers could continue their Scandinavian agropastoral practices on the island, albeit modified to the sub-Arctic location (Smith 1995; Ingimundarson 2008; Zori 2016). The following discussion will review what is known about the Scandinavian Norse agricultural economy and its adaption into the North Atlantic, with specific interest placed on early Icelandic practices within its environmental and social contexts.

Environmental Context

Iceland encompasses 103,000 km² of mainly mountainous, volcanic land. The closest landform to the island, Greenland, is 300 kilometers to the west. Norway is 1000 kilometers to the east and mainland Scotland is 830 kilometers to the southeast. The island lies along the North Atlantic Ridge which causes frequent volcanic eruptions that deposit widespread tephra (volcanic ash layers). Currently, one quarter of the island's surface is vegetated, with the majority lying in the lowlands (below 200 meters in elevation). Little less than half of the lowland vegetation is mire with a considerable amount drained for hay cultivation, while all vegetated land at higher elevations is bog due to erosion pulling lighter soils away. Roughly half of the remaining land is now sparsely vegetated or barren desert, caused by deforestation and erosion (Bergthórsson et al. 1985:392–393; Thomson 2003:3–6). In the 20th century, hay making took place on about 1400 km² of improved grassland, which accounts for about 6% of total vegetated area (Bergthórsson et al. 1985).

The island lies where the warm air of the North Atlantic Drift meets cold air of the East Greenland Polar Current. This creates an oceanic climate that is highly variable but tends to stay relatively warm when compared to other regions located in similar sub-Arctic latitudes. In southern Iceland, the climate is cool and wet while in the north and interior highlands, it is cooler and dryer. Current mean temperatures in the warmest month, July, range from 8-11 °C for most of the country, and in the coldest, January, range from 1-2 °C in the south to -6 or -7 °C in the highlands (Kosiba and Bauer 2013). The climate is highly variable, though, with fluctuations having severe implications on productivity and survivability. In warm periods, the sea ice extending from the East Greenland current stays quite distant from the island. During severe ice years that typically coincide with clustered freezes, the ocean can be covered in ice extending west from Greenland, encompassing Iceland, to halfway to Norway (Bergthórsson et al. 1985:394–398; Thomson 2003:2–6; Lawson and Kilbride 2007). This variability in the Icelandic weather created significant challenges to the early Norse settlers that impacted their subsistence strategies, but the socio-political context had just as important of an influence.

Social Context

Why was Iceland settled? There were many push and pull factors that can be attributed to the settlement of Iceland and other islands in the North Atlantic. Resource extraction, a need for land to farm, and a whole host of political, economic and social reasons may have drawn the Norse to the island (Zori 2016). A particularly prominent push factor lies in the political happenings of Norway in the 9th century when Harald Tanglehare (885-930 A.D.) succeeded in consolidating power over Norway. As a result, some of the lesser chieftains chose to flee his rule and migrate to the recently discovered Iceland (Smith 1995; Karlsson 2000:15; Þorgilsson and Grønlie 2006:4; Zori 2016).

Two books – written in the 12th and 13th centuries – recount the settlement of Iceland: The *Íslendingabók* (Book of the Icelanders) (Þorgilsson and Grønlie 2006) and the *Landnámabók* (Book of Settlements) (Pálsson and Edwards 1972). *Íslendingabók* states “Iceland was first settled from Norway in the days of Haraldr the Fine- Haired, son of Hálfdan the Black… 870 years after the birth of Christ, according to what is written in his

[Edmund’s] saga.” (Þorgilsson and Grønlie 2006:3). Archaeological data supports the age of settlement to be roughly between 874 and 930 A.D. (Ingimundarson 2008; Sveinbjarnardóttir et al. 2008; Smith 1995). Population estimates at the end of the Settlement fall between 25,000 to 80,000 range (Thorarinsson 1961; Fridriksson 1972; Bergthórsson et al. 1985:391). There is an estimated increase to 104,000 at the end of the Viking Age, and a following decline in the 13th century after the Commonwealth period coinciding with economic deterioration due to colonial rule by the Danes, climatic changes (the onset of the Little Ice Age) and rampant epidemics and natural disasters (Ingimundarson 2008).

Icelandic history follows a chronology based on prominent periods of social and political happenings (Steinberg et al. 2016). This thesis will use a modified version of this chronology. The divergences from the general chronology are based on the dated presence of volcanic eruptions and subsequent tephra layers found in the study area, see Figure 1 for an image of tephra layers in archaeological excavations. Steinberg et al. (2016) provide a description of the tephrochronology utilized in the Skagafjörður region.

Table 1 displays for comparison the general Scandinavian and Icelandic chronologies along with the modified sequence used in this thesis. The majority of analyses will focus on the Viking Age 870-1104 AD and the Medieval Age 1104-1766 AD, with the case studies focusing in on the subdivisions of the Viking Age – Early Viking Age (870-1000 AD) and Late Viking Age (1000-1104 AD).

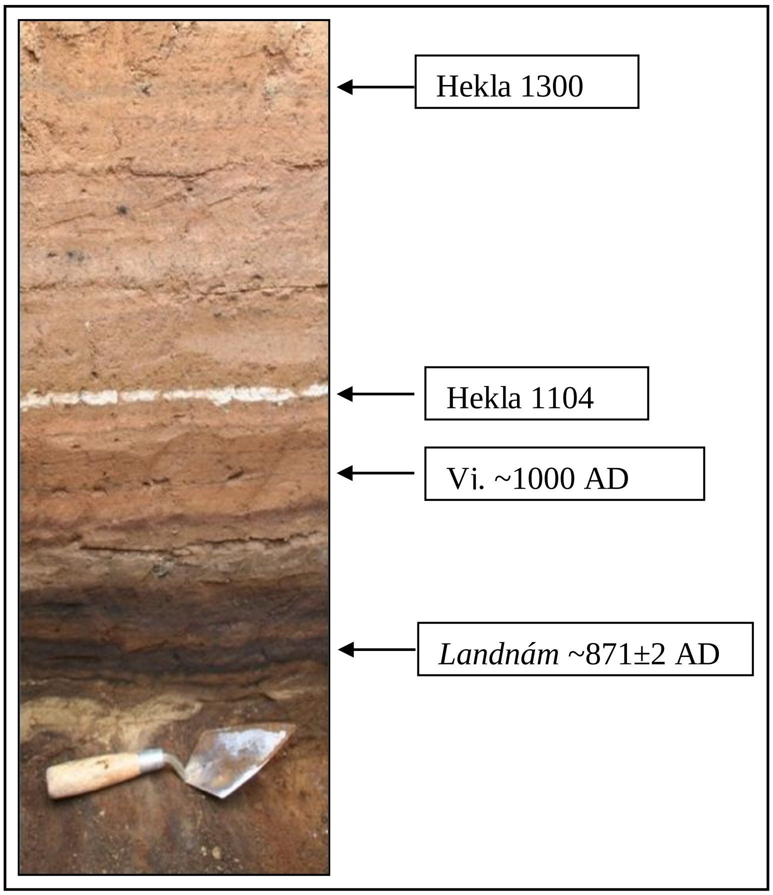


Figure 1. Excavated profile picture showing common in situ tephra layers in study area labelled with date of deposition.

Table 1
Comparative archaeological and historic chronologies and periods used in Scandinavia, Iceland, and this thesis.

Scandinavian	**Icelandic**	**This Thesis**
Viking Age 793/800-1066	Settlement 874-930 Commonwealth 930-1262	Viking Age 870-1104 Early VA 870-1000 Settlement 870-950 Expansion 950-1000 Late VA 1000-1104
Medieval 1066-1500	Norwegian Rule 1262-1380	
Post-Medieval 1500-1800	Danish Rule 1380-1918	High Medieval 1104-1300
Industrial 1800-1917	Home Rule 1918-present	Late Medieval 1300-1766
Modern 1917-present		Modern 1766-present

The Settlement period can be characterized by domestic production by large households, which included extended families and free and enslaved attached laborers, working the land around dispersed homesteads (Vésteinsson 1998; Sveinbjarnardóttir et al. 2008). The settlers relied on a broad subsistence-based economy that included animal husbandry (cattle, sheep, horse, pigs, geese and goat rearing), wildlife exploitation (fishing, hunting, and egg gathering), wild plant use, and cereal production (Ingimundarson 1995; Ingimundarson 2008). This economy is believed to be similar to those of the Scandinavian and British Isles models used by Norse settlers during the Viking Age, but adjusted for the Icelandic climate (Steinnes 1959; Sveinbjarnardóttir et al. 2008). Additionally, the earliest houses found in Iceland reflect those of the Norse homelands and colonies in the 9th and 10th centuries (Zori 2016). Therefore, a review of the better understood and studied Viking Age Scandinavian agropastoral economy will now be given to contextualize the Icelandic strategies that are central to this thesis. A specific look at the Norwegian models within the context of Icelandic settlement will also be presented.

Scandinavian Agropastoral Economy

As Christiansen (2006:192) states, “in Scandinavia and in all the Nordic societies to the West, as elsewhere, food-getting was the common work of all; by farming, hunting and gathering directly, or by way of trading skills or commodities.” Basic subsistence formed the backbone of Nordic society, with agriculture at its center. In the Scandinavian countries, the type of agriculture practiced varied depending on the region and surrounding environment. Christiansen (2006:192–194) lists five ways that the Viking Age Norse cultivated the land: (1) burn-beating; (2) inland-outland; (3) open field; (4) outland farming; and (5) infield-outfield. The infield-outfield system is generally accepted as the practice employed by Viking Age Icelandic farmers, driven by the need for gathering and the production of hay and will now be explained further (Amorosi 1992; Vésteinsson 1998; Vésteinsson et al. 2002; Simpson et al. 2003).

The infield-outfield system arose during the Iron Age in Southern Scandinavia (Grabowski 2011:24). It was based on a process of raising crops and animals alternately on closer or further fields. The infields closest to the homestead were intensively used, with manure (or *mygi, tadl, tad, tala)* consistently added for cultivation of cereals or grasses. These were often protected by an enclosure wall separating the infield from the outfields. In southern Scandinavia, infields were often left fallow and grazed sparingly to encourage grassland production for foddering. The enclosure walls defined the arable infields that the farmer had exclusive rights over (for at least part of the year) from the less fertile outfield (often subject to communal rights). This boundary or fence between farmland indicated the spatial divide of the limit of arable land, and functionally controlled the seasonal movement of livestock (Øye 2009). Outfields often included wetlands, meadows, mountainous heath and forest areas used for wildlife extraction and grazing. (Christiansen 2006:193; Grabowski 2011:24).

The infield-outfield system arose from the previous permanent field system used in the late Bronze and early Iron Ages. This permanent field system consisted of heavy manuring of cultivated land for one or more decades and then letting plots of land fallow for up to three decades. The fallowing periods became longer as nutrients were depleted, and pests increased. Thus, farmsteads migrated slowly across the landscape as new land was developed for farming and old fields left fallow. This period saw the introduction of manuring and hulled barley and oats as the predominant crops, with a debated disappearance of spelt and emmer wheat and naked barley (Øye 2004; Grabowski 2011). In Norway, porridge and everyday meals were made from oats, while barley was preferably used for beer making and special foods (Myhre 2004:56)

Rotation systems, such as two-course or three-course, were not as common in Norway as in warmer southern Scandinavia. The fields were generally under permanent cultivation without fallowing periods, especially areas where the scale of cultivation was limited. These plots were maintained by intensive manuring (the practice beginning in the early Iron Age and intensified over the course of the Viking and Middle Ages). This continually sowing without fallowing led to intensive use of small areas of cultivable land with increased area productivity with a crop assemblage adapted to local needs (Øye 2009).

The middle and late Iron Age saw the introduction and steady rise of rye cultivation in combination with hulled barley. Archaeobotanical data from Scandinavia shows that these were cultivated together in various crop rotations. Most commonly, rye was sown as an autumn crop after barley harvesting from a spring planting. Rye was much less nutrient demanding than barley, requiring less manuring of the fields while maintaining the same amount of grain yields. These two cereals in addition to oats, made up the bulk of cereal production in late Iron Age Scandinavia (Robinson 1994; Grabowski 2014). Even with a more productive cultivation strategy and field improvements, farmers could not produce more than one winter's provision per season. The regular affliction of harvest-failures and livestock plagues limited production and proved to be life-threatening (Christiansen 2006:192). However, the presence of grain cultivation high in Østlandet at 800m above sea-level, Norway (above the current grain boundary) shows the heavy importance of arable production within restrictive environments, a cultural trait that carried over to Iceland (Øye 2009).

Settlement in Iceland

Ingólfur Arnarson, Iceland's first historical attested permanent settler, established his farm in Reykjavík, ca. 870-4 A.D. Additional settlers, soon after, began to claim land in Iceland (Pálsson and Edwards 1972). Because Iceland was mainly settled by Norway via Norse colonies in the British Isles, the settlement pattern and farm types of the *landnám* is likely to reflect those of Norway at the time.

Norway had a large range of farming types, but the settlement pattern is generally characterized by separate, dispersed farms. In southern and western Norway, the land was organized around manor-type estates. These estates were controlled by a small elite class and supported by a much larger dependent class. In some regions, farms were completely independent of each other, while in other regions agglomerated farms were set in large, extensive farming fields subject to communal organization. During much of the later Iron and early Viking Ages, these farms were located on the best agrarian land. The development of farms has been described as an organic evolution from larger to smaller units, initiated by population growth and economic variables with additional increase of expansion onto marginal lands, when available (Myhre 2000; Sveinbjarnardóttir et al. 2008; Øye 2009).

In Iceland, historical and archaeological research finds a similar diversity in settlement patterns during *landnám*. The earliest settlers claim large tracts of land along the coasts, reaching inland to higher valleys. These farms included two or more households, including extended family members and free and enslaved laborer. Later, new settlers, family members and former slaves were granted smaller land plots from these larger claims. The 9th century farms were clustered around the coasts and wetland areas, with some extensive highland settlement. Later farms filled in between these and extended into the interior of the island (Smith 1995; Vésteinsson 1998; Christiansen 2006:201–202; Sveinbjarnardóttir et al. 2008; Steinberg et al. 2016). From historical documents, the land is said to have been fully settled by 930 A.D., with later immigrants establishing farms divided from existing farmsteads with the consent of the owners (Smith 1995; Bolender 2006:148; Þorgilsson and Grønlie 2006).

The early Icelanders encountered a forested landscape, with no previous human settlers, and an abundance of sea bird colonies, migrating nesting birds, and grasslands that could feed their livestock. The placement of the first farms was likely on available land – wetlands areas and open grass fields - naturally carved out of the forests. These lands were necessary as forage resources to support the livestock brought with them to the island (Vésteinsson 1998). It would have probably taken more than the first generation to establish fields for consistent haying, and thus hay was gathered from the surrounding bog and grasslands. Animals were probably grazed in the forest and upland regions and on the grasslands after harvesting. Continued deforestation for fuel sources and land management created larger areas of cleared, productive land for homefields dedicated to haying and cereal cultivation. Unimproved bog was traditionally used for hay making and gathering, but typically not great for animal grazing because sheep and horses prefer drier areas (Bergthórsson et al. 1985:392). Lowland and lower mountain slopes tend to be rather fertile and used for grazing. Primarily, the guiding factor in settlement was the need for forage gathering and production to support livestock (McGovern et al. 1988; Amorosi et al. 1996; Vésteinsson 1998; Lawson and Kilbride 2007; Adderley et al. 2008).

The Icelandic Cereal Cultivation Question

While the main agricultural and economic driver in early Iceland, and until recent history, has been the production and harvesting of hay forage from grasses, cereal cultivation was also practiced. Historical documents mention cereal cultivation and consumption (Pálsson and Edwards 1972; Þorgilsson and Grønlie 2006; Sveinbjarnardóttir et al. 2007; Sveinbjarnardóttir et al. 2008). Furthermore, Icelandic archaeologists and historians have noted the importance of barley (*Hordeum vulgare*) to early Icelandic society (Zutter 1992; Byock 2001:54; Erlendsson et al. 2009; Zori et al. 2013b). It has been understood as the only cereal grain that could be cultivated in such an environmentally marginal landscape because it is the most climatically tolerant cereal crop (Zutter 1999; Sveinbjarnardóttir et al. 2007; Erlendsson, Kevin J. Edwards, et al. 2009; Guðmundsson and Hillman 2012). However, the crop was and is still heavily restricted by the short growing season, relatively cool temperatures, and heavy rainfall. Despite the difficulties in growing barley, the self-sufficiency and the versatility of the grain (as food and drink, fodder, and the straw as bedding) probably drove its continued cultivation (Martin et al. 2018).

Furthermore, barley production has been interpreted as reflective of high social status because of its connections to ceremonial feasting and its role in maintaining the stratified Icelandic political economy (Sveinbjarnardóttir et al. 2007; Guðmundsson and Hillman 2012; Guðmundsson et al. 2013; Riddell et al. 2017). However, an in-depth analysis of Viking Age cereal production and consumption has yet to occur. Additionally, in the Skagafjörður region, the SCASS team has recovered barley grains from a variety of sites, with data suggesting that there is not a strong correlation with high status farms.

Skagafjörður Church and Settlement Survey Paleoethnobotany

SCASS and SASS has conducted archaeological research in Skagafjörður since 2001 to determine the extent, age and relative social status of farm mounds and associated churches in Skagafjörður, North Iceland (Bolender 2006; Bolender et al. 2008; Steinberg et al. 2016). Two landforms are the focus of this study, Langholt (meaning long hill) and Hegranes (meaning the nose of the Havard, probably derived from the first settler of the area's name Havardr hegri, translated into English as Havard the heron (Pálsson and Edwards 1972:90; Damiata et al. 2017:1)), as shown in Figure 2.

Langholt lies on the western flanks of the valley floor, encompassing lowland marshes and bogs, drained fields and highland access. The area today is considered fertile by Icelandic measurements (Steinberg et al. 2016). When the Icelanders arrive in Langholt, five farms were established first, before 950 AD. Over time, smaller farms were established equidistantly between these 5 first farms, with two auxiliary farms established much later. See Steinberg et al. (2016) for an in-depth description of the Langholt settlement pattern.

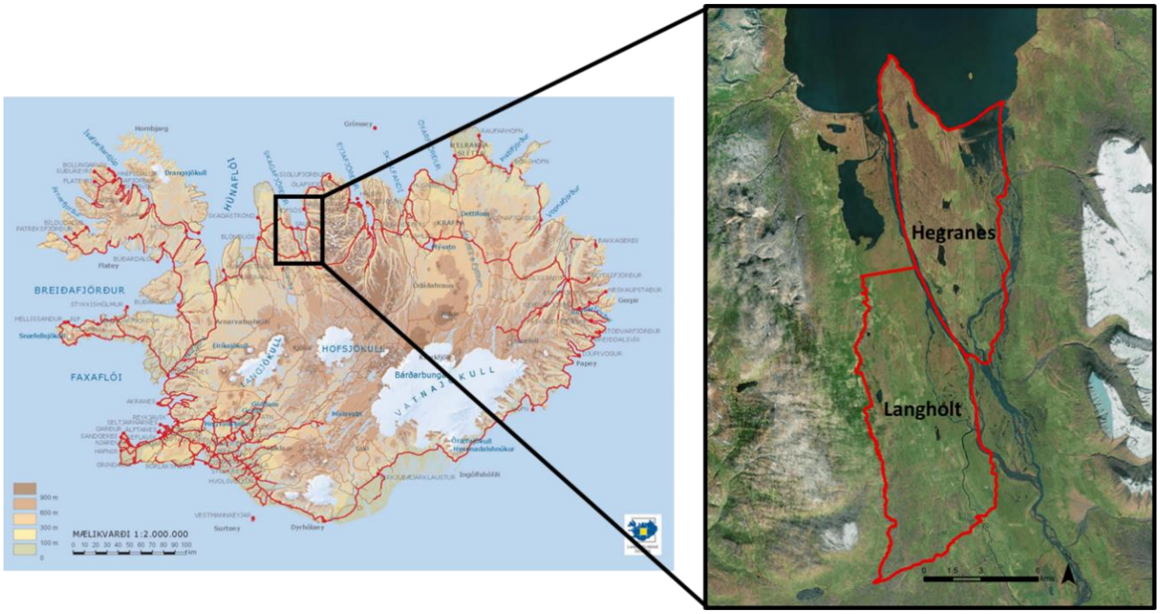


Figure 2. Map of Iceland with the research area of Skagafjörður, highlighted (left), air photo with the two studied landforms (Langholt and Hegranes) outlined (right). Map of Iceland courtesy of Landmælingar Íslands (Landmælingar Íslands 2018), map of study area created by author.

The second landform, Hegranes, is a rocky island located in the middle of the fjord. The island is separated from the rest of the region by two glacial rivers and their accompanying marshland. The highest point of the island is 120 meters above sea level. Much of the island consists of craggy cliffs blanketed in heathland, bogs, drained fields and some grassland. Significantly, the access to highland grazing is severely limited on Hegranes. While some sheep graze on the higher cliffs on the island, there is no obvious access to the highlands on either side of the fjord, without crossing over the marshlands, glacial rivers, and neighboring settled regions.

As part of the SASS/SCASS project, paleoethnobotanical samples were collected to assess agrarian and environmental characteristics of the farmsteads and region. Initially, samples were taken to determine the level of preservation of archaeobotanical remains and the best sampling practices, with the determination that remains do in fact preserve and at relatively high levels. An initial investigation on barley occurrence from a site in Langholt, Reynistaður, found that macrobotanical remains of barley grains, chaffs and rachis, was evidence for barley production and consumption at the farmstead. Additionally, the composition of other taxa is evidence for agriculture and the charred nature of the seeds and the presence of charred dung supports the notion of animals grazing on the fields and their dung being used as additional fuel (Trigg et al. 2009).

Icelandic Paleoethnobotany

Extensive archaeobotanical research in Iceland has examined Norse animal husbandry practices and the environmental impact of Norse settlement (Zutter 1997; Zutter 1999; Zutter 2000a; Ross and Zutter 2007). Further paleoethnobotanical analysis has been conducted with a focus on barley and cereal production in Iceland (Sveinbjarnardóttir et al. 2007; Trigg et al. 2009; Bold 2012; Guðmundsson and Hillman 2012; Mooney 2017). Researchers have tried to understand the variability in barley production across Iceland, looking at social status, the value of being first on the landscape, and the localized soil productivity and management practices of farms (Simpson et al. 2002; Adderley and Simpson 2005; Sveinbjarnardóttir et al. 2007; Adderley et al. 2008; Trigg et al. 2009; Bold 2012; Zori et al. 2013; Riddell et al. 2017).

The interest in barley production is driven by its importance as a main ingredient in beer production and its use in feasting and ceremonial practices in Norse culture. Iceland's social structure was based of the traditional Norse cultural systems, where chieftains relied almost exclusively on the support of local farmers, and through feasting rituals and ceremonies, managed to maintain these relationships and further their personal power (Karlsson 2005; Zori et al. 2013). Icelandic archaeologists have interpreted barley remains at high status sites as indicative of the social standing of those farms and the relationship of these farms with the surrounding social and environmental landscape (Sveinbjarnardóttir et al. 2007; Guðmundsson and Hillman 2012; Guðmundsson et al. 2013; Zori et al. 2013; Riddell et al. 2017).

CHAPTER 3

METHODS

This chapter will review the methods used in this thesis. Included are the SCASS paleoethnobotanical retrieval methods, macrobotanical analyses (including identification, count estimation, and identification limitations), the specific sampling strategies at the two case study farms, and statistical analyses used.

Paleoethnobotanical Retrieval

The SCASS project developed a systematic sampling strategy to use at each excavated site with the goal of retrieving archaeobotanical remains. This strategy, based on standard paleoethnobotanical sampling, was modified by Heather Trigg, John Steinberg and Douglas Bolender to fit the needs of the SCASS project. It was put into practice with slight changes depending on the excavator and the archaeological variances at sites. The sampling strategy will be described below. Following this are the sampling strategies used at two farms that were targeted specifically for obtaining potential oat grains (cf. *Avena)*. Taxonomic nomenclature follows that of Mossberg and Stenberg (2003). If not otherwise mentioned, the archaeobotanical sampling at a site defaulted to the SCASS systematic sampling strategy described below.

SCASS macrobotanical sampling strategy

A goal of the SCASS project was to develop a regional, systematic archaeological survey method to determine settlement patterns across two landforms in Skagafjörður. Archaeobotanical remains were determined necessary for understanding the settlement practices and assessing agrarian and environmental characteristics of these early Norse settlements. Because of Iceland's location just below the Arctic Circle, initial archaeobotanical sampling was conducted to determine the level of preservation of archaeobotanical remains in the Skagafjörður region. After this initial sampling and analysis, it was determined that archaeobotanical remains, specifically macrobotanical remains (leaves, seeds, charcoal, plant remains), preserved in the region and relatively well (Martin 2003).

Initially, archaeobotanical sampling concentrated on layers below the 1300 tephra. All stratigraphic layers below that tephra would then be sampled systematically for flotation samples. If no 1300 AD tephra was identified, sampling began at 1104 AD tephra and a later sample would be taken from the side wall, just above the 1104. When specific research questions required it (such as for this thesis), sampling would begin after the removal of the first context of a unit – usually designated as [101] (context numbers are within brackets, with the brackets indicating 'context'), which almost always consisted of a thick root mat layer. The [101] layer tended to have no stratigraphic integrity due to bioturbation from roots and worms. Flotation sampling would then be conducted on every following stratigraphic context to recover macrobotanical information representing the entirety of the temporal development of the site.

Early sampling consisted of filling two-liter plastic bags of soil from the top layer of the context after an initial cleaning of the surface to remove any possible contaminants from higher layers or modern vegetation. Due to the weather in Iceland that has consistent high winds, ensuring the removal of all contaminants would be impossible. Therefore, modern contaminants are likely in each sample, but generally can be parsed out using a variety of characteristics (lack of charring, time of year of species seeding, degradation of the seed). Sampling sizes steadily became larger as the sampling strategy solidified. This explains why on Hegranes, the average sampling size is 7 to 14 liters, while on Langholt it is 2 to 4 liters.

Reynistaður was the only farm to have samples floated following a bucket flotation process. Other than these few first samples all other samples were processed with a flotation machine, modelled after the SMAP (Shell Midden Archaeological Project) flotation machine, which allows for ease and speed of extraction during the flotation process (Watson 1976; Hastorf 1999). Figure 3 shows a diagram drawn by Patty Jo Watson of the SMAP-style flotation machine, alongside a photo of SCASS's flotation machine.

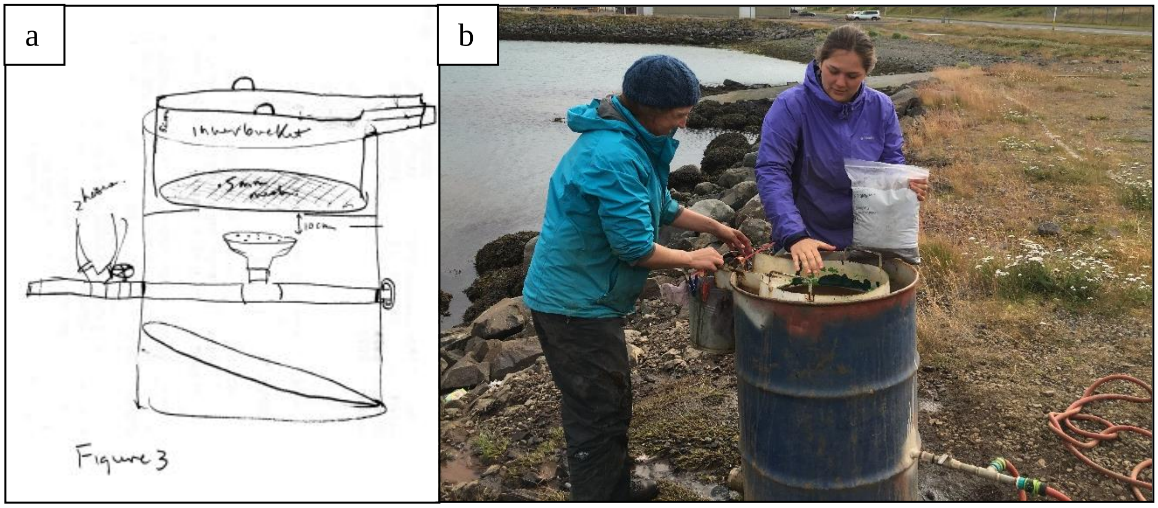


Figure 3. (a) sketch of Patty Jo Watson's diagram for the SMAP flotation machine, (from Hastorf 1999:3), (b) Photograph of the SMAP-style flotation machine being used during the SCASS project. (Photo by author, 2017)

Sampling strategy at Grænagerði (447-1, TP 2)

A 1x1 meter unit at Grænagerði was excavated in the 2017 field season (see Catlin et al. (2017) for a description of the 2017 excavation). From the archaeobotanical samples, twenty-three oat grains and two barley grains were recovered. This surprising number of oat seeds challenged our understanding of cereal production in Iceland and drove us to return to Grænagerði to recover a more robust sample.

In 2018, three 1x1 meter units were excavated adjacent to the previous year's unit followed the sampling strategy laid out in the previous year's excavation. No sample was taken from the top context, which encompasses the root mat. All lower contexts were sampled until sterile H3 tephra (eruption in ~1000 BC) or sterile subsoil was reached. The top and bottom of contexts were taken as separate flotation samples, each filling an approximately seven-liter plastic bag. Two of these bags were filled per sample for the top and bottom of each context. For thinner contexts, two flotation sample bags were taken that covered the full vertical extent of the context.

Sampling strategy at Vatnskot (443-0, TP 2)

Archaeobotanical analysis of the 2017 excavation at Vatnskot (443-0, TP1) found two oat and nineteen barley grains (see Bolender et al. (2018) for descriptions of the 2017 excavations). The large number of barley seeds in addition to the two oats seeds was surprising and differed from the sample removed from Grænagerði (447-1, TP 1), where two barley and twenty-two oats were recovered. In 2018, we returned to Vatnskot to recover a larger sample that could be used in comparison to the samples at Grænagerði and the other sites in our study area.

A 1x2 meter unit was excavated adjacent to the previous year's excavation. The initial plan was to follow the sampling strategy from TP1, with changes as necessary to target cereal-rich layers for sampling. As excavations were underway, changes in the nature of the deposits and inconsistencies between what was seen versus recorded from the previous excavations caused some adjustments in the sampling strategy and contexts divisions. A post-1104 historic intrusive pit feature was only screened for faunal remains, and two other contexts identified in the previous year's excavations did not expand into the 2018 unit.

Macrobotanical Analyses

Identification

Identification procedures followed the direction of Dr. Heather Trigg and those in Hastorf and Popper (1988). Samples were divided in a four-level, USA Standard Test sieve (Newark) with mesh sizes of 2 mm, 1 mm. and 0.5 mm. Each level was examined under 10-

40x magnification with a Bausch and Lomb dissecting microscope. Charcoal pieces were generally collected from the 2mm level of the light fractions and percentage of assemblage was estimated. If charcoal consisted of more than 50% of the assemblage and charcoal counts were over 50-70 individual pieces, charcoal was not collected and only the percentage of the assemblage estimated. If counts were collected, these were weighed. Percentage of bone and stone were also estimated from the 2mm light fraction level; with large, identifiable pieces of bone often removed. Entire light and heavy fractions were weighed separately up until 2012.

Recovered seed remains were counted (counts estimated when necessary – see below), identified and stored with their respective samples. Almost all seed identifications were done to the family level. Some taxa could be identified down to species or required more specific identification, generally done to the genus. This included Poaceae (*Hordeum* and *Avena*), Ericaceae (*Vaccinium, Empetrum*) Portulaceae (*Montia fontana*), and Menyanthaceae (*Menyanthes trifoliata*).

Poaceae that were unidentifiable, but clearly cereal were deemed cereals, other larger poaceae called large, and all other small poaceae called wild. If a grain or grain fragment was too deteriorated or diagnostic traits such as the central furrow or embryo/embryo scar could not be located, the grain was simply identified as a cereal. If a cereal identification could not be secured, grains were identified as Poaceae large. This occurred when the grain was generally smaller than typical for oats or barley, but still much larger than a typical wild grass. Further work is required to identify these down to the genera or species.

Identifications were verified using the comparative collections housed at the Fiske Center Paleoethnobotany Lab, online and published sources (Martin and Barkley 1961; Montgomery 1977).

Count Estimation

When possible, all seeds were collected and counted from samples. There is a wide range in seed counts in samples, from none to hundreds of thousands. When there was a high abundance of a specific family during scanning, we estimated the total count to expedite the process. Almost exclusively, uncharred *Stellaria* and *Montia fontana* required count estimation in samples. Often these genera would be in the tens of thousands. Estimation was conducted through a tested splitting method.

After scanning the entire sample for other taxa, the soil sample (including the taxa to be estimated) was put through this splitting method. Using a Humbolt splitter (model H-3980), the sample would be split to 16, 32 or 64 sub sections, depending on the estimated size of the sample. Six of these sections would then be counted and then averaged. This average was then multiplied by the split number to determine the estimated count for the full sample.

Limitations

Random and systematic checks on the quality of the seed identification and while changes were made, there was broad consistency in seed identification. Only light samples were used in the analysis for this thesis, primarily because all light fractions have been examined and identified, while only some heavy fractions have been looked over the course of the project. There are few macrobotanical remains other than charcoal that would exist in

Iceland that only appear in heavy fractions – such as imported fruit pits (as Mooney (2017) found at Lækergata).

Statistical Analyses

All statistical analyses were conducted through IBM's Statistics Program for Social Sciences 25 (SPSS). Through the program, analyses including independent t-tests and correlation tests were conducted. SPSS was also used to display data in scatterplots, histograms and box and whisker plots, sometimes lightly edited with Adobe Illustrator.

CHAPTER 4

RESULTS

Approximately 753,457 identified seeds provide the bulk of the raw data for this thesis (APPENDIX A and Appendix). These seeds span 1,061 samples from 42 different farmsteads. Forty-one individual taxa were identified for this thesis, spanning a range of context types – of which only middens, unless otherwise noted, are used in the analyses. Of the total seeds, 76.4% (n=575,365) are uncharred and 23.6% (n=178,092) are charred. Approximately 387,171 identified seeds were recovered from Langholt while Hegranes provided about 366,130 identified seeds. In Langholt, 13.7% of seeds are charred (n=52,880), while in Hegranes 34.2% (n=125,166) are charred. Three hundred and forty-one cereal grains were recovered from 24 sites, of which 317 were recovered from midden contexts and used in analyses. The results on identified taxa, contexts, charring status and cereal grains will be presented in this chapter.

Taxa identified

The taxa identified are organized into generalized habitat types. Table 2 lists the taxa identified, their common names, their generalized habitat type, the total number of samples each taxon is present, total count of taxa and total count of each taxa in each region. Designation of habitat types follows Ross and Zutter (2007) and Kristinsson (2013). The four generalized habitat types are Field, Wetland, Heath and Apophyte. Fields include grassland

and homefield taxa – grassland including taxa grown naturally in the surrounding farm area (various grasses and weeds of grasslands) and homefield including taxa that typically were cultivated within homefield boundaries (cereals, various grasses). Wetlands include full aquatic environments, mires, bogs, or marshes. Heath includes rocky outcrops and shrubland habitats. Apophytes grow in disturbed, phosphate-rich environments and often benefit from human activity. This can include taxa that grown near the farmhouse, on the midden and related to agrarian practices (Ross and Zutter 2007). This list does not include unidentified seeds or plant fragments.

Two taxa dominate the assemblages: Caryophyllaceae (n=633,796) and Portulaceae *Montia fontana* (67,590), together making up 93% of the total assemblage. After these two taxa, the three most numerous taxa are Cyperaceae, or sedge, (n=23,572), Poaceae wild, or grasses, (n=12,714) and Ericaceae *Empetrum*, or crowberry (n=5,201), making up 5.5% of the total assemblage. These counts are also broken down by region in Table 2. Table 3 and Table 4 display taxa counts per region broken down by time period. For both regions, the Viking and Medieval Ages have the highest number of total seed counts, which may be reflected in a sampling strategy that favored cultural deposits. This is mitigated in analyses by standardizing by liters floated.

Table 2
Taxa identified from all contexts and periods with general habitat type, the numbers of samples these taxa are present, total count of taxa, and total counts per region.

Taxa	Common name	Habitat Type	Samples present	Total count	Langholt count	Hegranes count
Apiaceae	Umbellifers	Field	1	1	1	0
Arctostaphylos uva-ursi	Bearberry	Heath	12	18	1	17
Asteraceae	Daisy	Field	20	27	4	23
Capsella	Shepard's purse	Apophyte	87	1334	717	617
Caryophyllaceae	Pinks	Apophyte	1,280	633,796	331,855	301,941
cf. Avena	Oat	Field	20	48	8	40
Chenopodium	Goosefoot	Apophyte	16	32	11	21
Cyperaceae	Sedge	Wetland	1,028	23,572	7,785	15,787
Empetrum	Crowberry	Heath	485	5,201	1,445	3,756
Epilobium	Willowherb	Field	1	1	0	1
Ericaceae	Heaths	Heath	2	13	0	13
Fabaceae	Legumes	Field	5	6	3	3
Galium	Bedstraw	Heath	4	5	0	5
Hordeum	Barley	Field	95	240	85	155
Juncaceae	Rushes	Wetland	16	52	2	50
Lamiaceae	Mints	Field	1	1	0	1
Leontoden	Autumn hawkbit	Field	10	19	0	19
Linaceae	Flax	Heath/Field	3	11	0	11
Linum	Flax	Heath	3	3	1	2
Lolium	Ryegrass	Field	2	2	1	1
Lupinus	Lupine	Heath	1	1	0	1
Menyanthes trifoliata	Bog Bean	Wetland	141	705	331	374
Montia fontana	Water-blinks	Apophyte	230	67,590	30,751	36,839

Table 2 continued Taxa identified for this thesis.						
Taxa	Common name	Habitat Type	Samples present	Total count	Langholt count	Hegranes count
Myosotis	Forget-me-not	Heath	6	13	3	10
Poaceae cereal		Field	25	53	26	27
Poaceae large		Field	1	6	0	6
Poaceae Wild	Wild grasses	Field	619	12,714	7,983	4,731
Polygonaceae	Buckwheat family	Field	145	1,160	407	753
Polygonum	Knotweed	Field	64	2,279	2,073	206
Portulaca	Purslane	Wetland	8	14	8	6
Potamogeton	Pondweed	Wetland	23	67	44	23
Ranunculus	Buttercup	Apophyte	102	518	407	111
Rhinanthus	Yellow rattle	Apophyte	21	54	0	54
Rosaceae	Rose family	Heath	112	1,463	1,231	2,32
Rubus	Brambles	Heath	6	10	3	7
Rumex	Dock/sorrel	Apophyte	31	1,021	1,018	3
Taraxacum	Dandelion	Apophyte	33	161	20	141
Trifolium	Clover	Apophyte	48	210	205	5
Vaccinium	Bilberry	Heath	33	45	21	24
Viola	Violet	N/A	20	51	23	28
Violaceae	Violets	Apophyte	93	774	698	76

Table 3
Counts of taxa recovered from Hegranes by time period; includes all context types.

Taxa	Hegranes				
	Prehistoric	Viking Age	Medieval	Modern	Undetermined
Apiaceae					
Arctostaphylos		16	1		
Asteraceae	4	13	6		
Capsella	2	504	106		5
Caryophyllaceae	101	242,839	57,516	392	1,093
cf. Avena		40			
Chenopodium		19	2		
Cyperaceae	56	14,364	924	126	317
Empetrum	4	3,553	160	24	15
Epilobium		1			
Ericaceae		13			
Fabaceae		3			
Galium		5			
Hordeum	1	147	7		
Juncaceae		50			
Lamiaceae		1			
Leontoden		13	6		
Linaceae		11			
Linum		2			
Lolium		1			
Lupinus		1			
Menyanthes		242	106	7	19
Montia		33,115	3,691		33
Myosotis		10			

Table 3 continued
Counts of taxa recovered from Hegranes by time period; includes all context types.

	Prehistoric	Viking Age	Medieval	Modern	Undetermined
Poaceae cereal		27			
Poaceae large		6			
Poaceae Wild	48	4,266	380	9	28
Polygonaceae	32	475	246		
Polygonum		41	162	3	
Portulaca		6			
Potamogeton		14	3		6
Ranunculus		64	45	1	1
Rhinanthus	1	24	29		
Rosaceae		80	128	3	21
Rubus		6	1		
Rumex		3			
Taraxacum	17	115	9		
Trifolium		3	2		
Vaccinium		13	11		
Viola		10	14		4
Violaceae	2	65	6	2	1
Total for Time Periods	268	300,181	63,561	567	1,543

Table 4
Counts of taxa recovered from Langholt by time period; includes all context types.

Taxa	Langholt				
	Prehistoric	Viking Age	Medieval	Modern	Undetermined
Apiaceae			1		
Arctostaphylos		1			
Asteraceae		1	3		
cf. Avena		8			
Capsella		710	7		
Caryophyllaceae	35	67217	263554	962	87
Chenopodium		9	2		
Cyperaceae	11	4835	1849	1072	18
Empetrum	1	881	263	104	196
Epilobium					
Ericaceae					
Fabaceae		2	1		
Galium					
Hordeum		78	6	1	
Juncaceae		1	1		
Lamiaceae					
Leontoden					
Linaceae					
Linum		1			
Lolium		1			
Lupinus					
Menyanthes		289	42		
Montia		18327	12421	3	

Table 4 continued
Counts of taxa recovered from Langholt by time period; includes all context types.

	Prehistoric	Viking Age	Medieval	Modern	Undetermined
Myosotis		3			
Poaceae cereal		25	1		
Poaceae large					
Poaceae wild	2	6828	780	360	13
Polygonaceae		90	305	12	
Polygonum		913	1125	35	
Portulaca		2	4	2	
Potamogeton		8	36		
Ranunculus		99	296	12	
Rhinanthus					
Rosaceae	1	87	1123	20	
Rubus		1	1	1	
Rumex		68	950		
Taraxacum	1	7	12		
Trifolium		5	190	10	
Vaccinium		18	1		2
Viola		6	17		
Violaceae		2	633	63	
Total for Time Periods	51	100,523	283,624	2,657	316

Contexts

Seeds were recovered from different types of contexts in different proportions. Twenty-five different context types are used to describe deposits in the SCASS excavations. 99.66% (n=750,880) of the total seeds in the study area (including Langholt and Hegranes), were recovered from the top six contexts (Middens, Aeolian Deposit, Floor, Mixed Turf, Tephra, and Cultural Layer) Table 5). Middens constitute 95.0% (n=715,811), Aeolian Deposits contain 1.82% (n=13,685), Floors contain 1.49% (n=11,264), Mixed Turf contain 0.64% (n=4,802), Tephra (which are almost always within a midden or cultural layer) contain 0.48% (n=3,586) and Cultural Layers (does not meet all requirements of a midden, but are still cultural in some way) contain 0.23% (n=1,732). To limit taphonomic and preservation discrepancies from different depositional contexts, only midden contexts are used in the analyses in this thesis (unless otherwise noted). As middens constituted 95.0% of the total assemblage, only a small portion of the total assemblage is left unanalyzed with this method. Charred totals and percentages are also displayed in Table 5 and this is further broken down in the next section on charring.

Table 5
Distribution of total identified seed assemblages by context type. Not divided by region.

Context Type	Not charred	Charred	Context Total	Assemblage Percentage
Midden	554,981 77.5%	160,830 22.5%	715,811 100%	95.00%
Aeolian Deposit	13,339 97.5%	346 2.5%	13,685 100%	1.82%
Floor	784 7.0%	10,444 93.0%	11,264 100%	1.49%
Mixed Turf	4674 97.3%	128 2.7%	4,802 100%	0.64%
Tephra	355 9.9%	3,231 90.1%	3,586 100%	0.48%
Cultural Layer	369 21.3%	1,363 78.7%	1,732 100%	0.23%
Fire Pit	238 43.2%	313 56.8%	551 100%	0.07%
Topsoil	99 34.5%	188 65.5%	289 100%	0.04%
Plow zone	4 1.4%	277 98.6%	281 100%	0.04%
Hearth	109 39.8%	165 60.2%	274 100%	0.04%
Peat Ash	0 0.0%	222 100%	222 100%	0.03%
Undetermined	128 51.2%	122 48.8%	250 100%	0.03%
Collapse	85 57.8%	6 42.2%	147 100%	0.02%
Upcast	35 40.7%	51 59.3%	86 100%	0.01%
Low Density Cultural Deposit	64 76.2%	20 23.8%	84 100%	0.01%
Turf	2 2.9%	68 97.1%	70 100%	0.01%
Pavement	0 0.0%	72 100%	72 100%	0.01%
Bog	49 83.1%	10 16.9%	59 100%	0.01%
Pit	0 0.0%	54 100%	54 100%	0.01%

Table 5 continued
Distribution of total identified seed assemblages by context type. Not divided by region.

Context Type	Not charred	Charred	Context Total	Assemblage Percentage
Iron Pan	40 78.4%	11 21.6%	51 100%	0.01%
Trough	0 0.0%	16 100%	16 100%	0.00%
Disturbed	0 0.0%	15 100%	15 100%	0.00%
Fill	9 11.0%	73 89.0%	82 100%	0.01%
Natural turf	0 0.0%	11 100%	11 100%	0.00%
Wall	1 100.00	0 0.0%	1 100%	0.00%
Total	575,365 76.4%	178,092 23.6%	753,457 100%	100.00%

Charring

The proportion of charring in assemblages is important for understanding the behavioral and depositional processes that lead to seed presence in the archaeological record. Of the total assemblage analyzed, 76.4% (n=575,365) seeds are uncharred and 23.6% (n=178,092) are charred (Table 5). However, two taxa dominate the seed assemblage – Caryophyllaceae and Portulaceae *Montia fontana* (collectively termed Cary/*Montia* in this thesis). When these are removed, the ratio of charred to uncharred for all other seeds is remarkably different. Of all other seeds, 74.3% (n=38,590) are charred and 25.7% (n=13,343) are uncharred. Comparatively, 19.2% (n=121,978) of Caryophyllaceae are charred, and 25.9% (n=17,524) of *Montia fontana* are charred. These relative proportions are very similar between the two taxa, but almost the opposite to all other seeds. See Table 6 for a comparative table of these proportions.

Table 6
Counts and percentages of charred and uncharred Caryophyllaceae, Portulaceae *Montia fontana*, and all other seed taxa. Table includes all time periods and context types.

Charred Status	Other seeds	Caryophyllaceae	P. *Montia fontana*
Charred	38,590 74.3%	121,978 19.2%	17,524 25.9%
Uncharred	13,343 25.7%	511,847 80.8%	50,175 74.1%
Total (753,457)	51,933 6.9%	633,825 84.1%	67,699 9.0%

Charring data is further broken down by region in Table 7 and by time period (Viking and Medieval Age) in Table 8. Total seeds without Cary/*Montia* (other seeds) have a fairly even charring distribution at Langholt with 57.4% charred (n=14,085) and 42.6% uncharred (n=10,480). At Hegranes this distribution is 89.5% charred (n=24,505) and 10.5% uncharred (n=2,863). The proportion of other seeds between the regions is 47.3% (n=24,565) in Langholt to 52.7% (n=27,368) in Hegranes. This similar distribution of counts of seeds is also reflected in Caryophyllaceae and *Montia fontana*. Langholt contains 52.4% (n=331,855) of the total Caryophyllaceae and 45.4% (n=30,751) of the total *Montia fontana.* Hegranes contains 47.6% (n=301,970) of the total Caryophyllaceae and 54.6% (n=63,948) of the total *Montia fontana.*

Table 7
Regional counts and percentages of charred and uncharred Caryophyllaceae, Portulaceae *Montia fontana*, and all other seed taxa. Table includes all time periods and context types.

Region	Charred Status	Other seeds	Caryophyllaceae	P. *Montia fontana*
Langholt	Charred	14,085 57.4%	29,911 9.0%	8,884 28.9%
	Uncharred	10,480 42.6%	301,944 91.0%	21,867 71.1%
	Total	24,565	331,855	30,751
Hegranes	Charred	24,505 89.5%	92,067 30.5%	8,640 23.4%
	Uncharred	2,863 10.5%	209,903 69.5%	28,308 76.6%
	Total	27,368	301,970	36,948

The analyses in this thesis focus solely on the Viking Age and Medieval Age and so the charring distribution between time periods will focus on those periods. Data from other time periods are presented as well in Table 8. These data include both regions. In the Viking Age, other seeds are mainly charred, 85.2% (n=33,413). In the Medieval Age, the charred portion of the assemblage is 34.5% (n=3,453). For both time periods Cary/*Montia* consist mostly of uncharred.

Table 8
Counts and percentages by time period of charred and uncharred Caryophyllaceae, Portulaceae *Montia fontana*, and all other seed taxon. Table includes both regions and all context types.

Period	Charred Status	Other seeds	Caryophyllaceae.	P. *Montia fontana*
Viking Age	Charred	33,413 85.2%	109,218 35.2%	11,243 21.9%
	Uncharred	5,803 14.8%	200,838 64.8%	40,199 78.1%
	Total	39,216	310,056	51,442
Medieval Age	Charred	3,453 34.5%	11,871 3.7%	6,248 38.8%
	Uncharred	6,550 65.5%	309,199 96.3%	9,864 61.2%
	Total	10,003	321,070	16,112
Modern	Charred	1,008 54.0%	625 46.2%	0 0.0%
	Uncharred	859 46.0%	729 53.8%	3 100.0%
	Total	1,867	1,354	3
Other Periods (Prehistoric and Unknown)	Charred	716 84.5%	264 19.6%	33 23.2%
	Uncharred	131 15.5%	1,081 80.4%	109 76.8%
	Total	847	1,345	142
Total of assemblage	Charred	38,590 74.3%	121,978 19.2%	17,524 25.9%
	Uncharred	13,343 25.7%	511,847 80.8%	50,175 74.1%
	Total	51,933	633,825	67,699

To summarize the specific data used in most analyses for this thesis (unless otherwise stated), Table 9 displays the charring status of all other seeds (excluding Cary/*Montia*) from midden contexts of the Viking and Medieval Ages. In general, 71.3% (n=27,886) seeds are charred. 83% of Viking Age seeds are charred, while 26.7% of Medieval seeds are charred. For both time periods, Hegranes has a higher proportion of charred seeds: 97.6% for Viking Age and 67.8% for Medieval Age. Viking Age Langholt assemblages have 65.5% charred and Medieval assemblages have 26.7% charred.

Table 9
Counts and percentages of charred and uncharred seeds (excluding Cary/*Montia*) recovered from midden contexts split by region and by time period.

Region	Period	Uncharred	Charred	Total
Hegranes	Viking Age	1,406	17,717	19,123
		7.4%	92.6%	100.0%
	Medieval	584	1,229	1,813
		32.2%	67.8%	100.0%
	Total	1,990	18,946	20,936
		9.5%	90.5%	100.0%
Langholt	Viking Age	3,643	6,907	10,550
		34.5%	65.5%	100.0%
	Medieval	5,579	2,033	7,612
		73.3%	26.7%	100.0%
	Total	9,222	8,940	18,162
		50.8%	49.2%	100.0%
Grand Total	Viking Age	5,049	24,624	29,673
		17.0%	83.0%	100.0%
	Medieval	6,163	3,262	9,425
		65.4%	34.6%	100.0%
	Total	11,212	27,886	39,098
		28.7%	71.3%	100.0%

Cereals

Three hundred and forty-one cereal grains were recovered from twenty-four farmsteads. All cereal grains were charred, with varying degrees of puffing, warping, and other deterioration. Cereals include 6-rowed hulled barley (*Hordeum vulgare)* (Figure 4), oats (cf. *Avena*) (Figure 5), undetermined cereals, and large poaceae. Undetermined cereals are grains that are identified as cereals, but due to deterioration, disfigurement, or fragmentation, the genus could not be determined. 96.2% (n=328) were recovered from Viking Age contexts, with the remainder (n=13) from Medieval Age contexts. The majority of these grains for both the Viking and Medieval Ages were recovered from Middens (93.2% (n=317). See Table 10 for counts of cereals recovered by context type and time period.

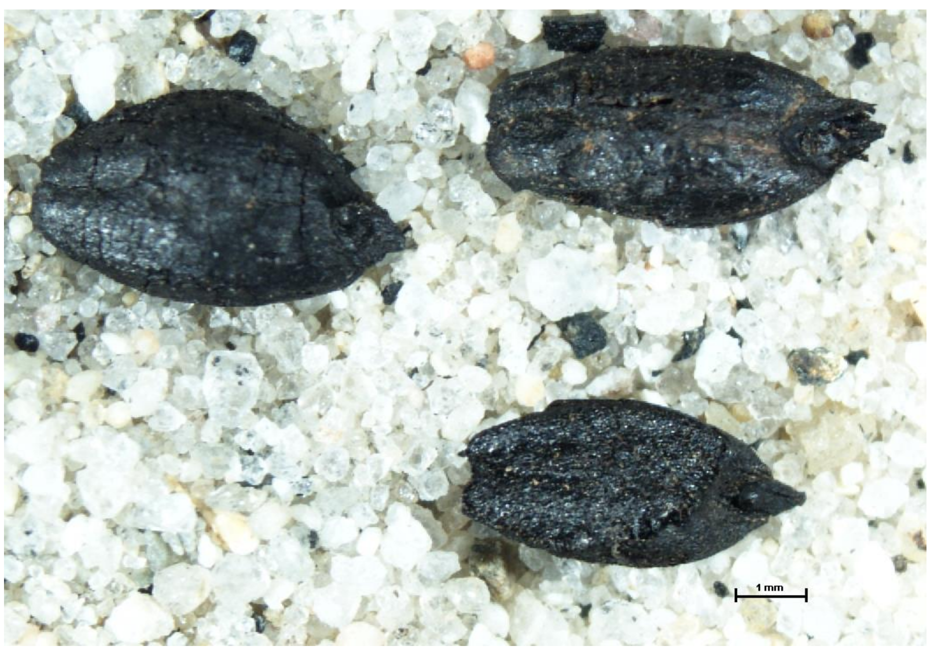


Figure 4. Photo of charred barley (*Hordeum vulgare)* recovered from a Hegranes farm.

Figure 5. Photo of possible oats (cf. *Avena*) recovered from a Hegranes farm.

A total of 240 barley grains (both fragmented and whole) were recovered from 24 places. The majority were recovered from midden contexts, 91.25% (n=219), while the remainder (n=21) were recovered from various context types. Most barley grains were recovered from Viking Age contexts (94.6%, n=226). Thirteen grains were recovered from Medieval Age contexts representing 5.4% of the total barley count. These Medieval Age barley grains were recovered from temporally-insecure contexts and are discussed further below. For the purposes of this thesis, the original stratigraphic temporal context was held for analyses.

Table 10
Cereal counts from both regions by time period and context type.

	Hordeum	cf. *Avena*	Undetermined cereal	Total
Viking Age				
Midden	212	46	52	310
Floor	10	2	1	13
Aeolian Deposit	2			2
Cultural Layer	1			1
Iron Pan	1			1
Natural Turf	1			1
Total	227	48	53	328
Medieval Age				
Midden	7			7
Aeolian Deposit	6			6
Total	13			13
Grand Total	240	48	53	341

Non-Viking Age Barley grains

447-1 TP2 [105] Sample #16 & 17

Six barley grains were recovered from samples 16 and 17 (three from each sample) from [105] at 447-1, TP2. These samples were taken from an Aeolian Deposit layer with the 1104 tephra layer at the bottom and from the full vertical span of the context. While they may be Medieval, there is a possibility that these grains are from pre-1104 contexts. Due to the insecurity of the temporal context and recovery from an Aeolian Deposit, these grains were not used in further analyses in this thesis. Seventeen other barley grains were recovered form Viking Age middens at this site. AMS would provide a clarification on the dating of these grains.

442-0 TP1 [110] Sample #3

One barley grain was recovered from sample 3 from [110] at 442-0. This sample was taken from a charcoal lens in what is mostly pre-1300 midden. However, the charcoal deposit that this sample was taken from had flecks of the 1104 tephra layer throughout the deposit. Thus, while this sample is likely Medieval, the context is not very secure. No other barley grains were recovered from this site.

63-0 A [104] Sample #16

This is one of the first flotation samples that were taken and processed. Systems of context recording had not been established when these samples were taken and processed. Records indicate that context [104] is clearly above the Hekla 1104 tephra layer in a secure context. AMS dates from barley grains removed from this sample do not support the Medieval stratigraphic date. An AMS sample processed in 2015 produced a date of 1095 ± 15 BP (cal AD 895-990 (2σ) UCI: 159340), and one processed in 2017 produced a date of 1230 ± 15 BP (cal AD 694-875 (2σ) UCI:186197), both solidly in the Viking Age.

104-1 D [145] Sample #13

One barley grain was recovered from sample 13 from [145] at 104-1, area D. The 1104 tephra was identified in this midden layer along with turf fall. While [145] is close to the surface, it is below a charcoal lens, and, like most of excavation D it appears to be Viking

Age. However, this deposit was recovered from the eroded edge of a ravine and could be heavily mixed with other deposits creating an unsecure context.

Cereals for analyses

Unless otherwise noted, only midden contexts were analyzed in this thesis. From midden contexts, 219 barley grains were recovered from 19 sites, 43 oat grains were recovered from 7 sites and 52 undetermined cereal grains were recovered from 7 sites. Table 11 displays cereal grain counts from midden contexts from Hegranes and Table 12 shows this for Langholt, broken down by time period and farm size, with total midden liters floated. Sizes of Viking Age farms are determined from depth and extent of middens below the 1104 AD tephra layer (taken from coring data). This archaeological measure of farmstead size has been demonstrated to be a good proxy for historical farm wealth and productivity (Steinberg et al. 2016). For each region, the mean midden size was determined. A farm's midden that was above this mean is considered big and a farm below is considered small. For Hegranes this mean is 1,683 m^2 and for Langholt this mean is 3,174 m^2.

Table 11
Hegranes cereal counts from Midden Contexts, sorted by region, time period, and farm size. Farm numbers are the farm identifiers.

	Farm numbers	Hordeum (grain/volume)	cf. Avena (grain/volume)	Undetermined cereal (grain/volume)	Volume floated (L)
Viking Age					
Big farms					
	442-0	34 (0.28)	2 (0.02)		122.9
	443-0	46 (0.18)	3 (0.01)	1 (0.00)	252.5
	445-0		1 (0.03)		35
	445-6	4 (0.08)			48
	447-0	1 (0.01)			68
	447-4	2 (0.02)	2 (0.03)	11 (0.16)	67
	451-0	3 (0.04)			80.5
Total		90 (0.13)	8 (0.01)	26 (0.04)	673.9
Small farms					
	442-1	3 (0.09)			31.7
	445-3	6 (0.06)			93.5
	447-1	20 (0.07)	29 (0.11)	14 (0.05)	271
	447-2	1 (0.01)			137.5
	450-1	4 (0.06)			64.6
	450-2	17 (0.31)			54.5
	451-1	1 (0.02)			45
Total		52 (0.08)	29 (0.04)	14 (0.02)	687.8
Medieval					
Big farms					
	442-0	1 (0.02)			57.7
Grand total		143 (0.10)	37 (0.03)	26 (0.02)	1429.4

Table 12
Langholt cereal counts from Midden Contexts, sorted by region, time period, and farm size. Farm numbers are the farm identifiers.

	Farm numbers	Hordeum (grain/liter)	cf. Avena (grain/liter)	Undetermined cereal (grain/liter)	Volume floated (L)
Viking Age					
Big farms					
	1006-0	17 (0.10)	5 (0.03)	18 (0.11)	170
	104-1	5 (0.24)		2 (0.01)	212
	111-1	10 (0.05)		2 (0.01)	187.3
	57-0	2 (0.13)			16
	63-0	35 (0.65)	1 (0.02)	3 (006)	54
Total		68 (0.11)	6 (0.01)	25 (0.04)	639.3
Small farms					
	62-0	1 (0.03)			31.7
Medieval					
Big farms					
	63-0	6 (0.43)			14
Grand total		76 (0.11)	6 (0.1)	26 (0.4)	685

CHAPTER 5

MACROBOTANICAL RECORD

A portion of the results discussed in the previous chapter will be utilized in this thesis to answer questions regarding production strategies and variation across farms, regions and time. This chapter analyzes the macrobotanical data to understand the depositional and preservational conditions that created the macrobotanical record in the SCASS sites. These depositional and preservation processes, including charring, that deposited seeds into the midden assemblages requires further discussion and supports the removal of some taxa (Caryophyllaceae and *Montia* fontana) from further analyses while allowing the inclusion of others (all other uncharred and charred seeds). Preservation of seeds, both charred and not charred is examined, followed by a discussion on ways seeds could be incorporated into the archaeological record: archaeological seed rain, direct resource utilization (human food and kitchen accidents/waste) and indirect resource utilization (barn cleanings and dung used as fuel). The nature of the majority of the assemblage, including cereals, is determined as representative of livestock dung utilized as fuel and deposited on the midden. The chapter is concluded through a discussion on the diversity and evenness of the seed assemblages and what this implies for production practices at farms.

Preservation

Macrobotanical remains preserve in the archaeological record through various processes. Carbonization, in addition to waterlogging and desiccation are the primary means of preservation of macrobotanical remains (Renfrew 1973:8–19). Generally, uncharred seeds in archaeobotanical assemblages are considered modern infiltrates as uncharred seeds rarely preserve well unless in certain preservation environments – such as anerobic environments like privies. The charred remains in these assemblages can be accurately assumed as archaeological (and further supported by the laws of superposition and AMS dating). Furthermore, in Iceland, the preservation of archaeobotanical material is relatively excellent, even uncharred specimens. This may be due to a combination of the cold climate, water-rich (and often water-logged, i.e. bogs), and the chemical make-up of the middens themselves that these samples were recovered from.

As reported in the results section, 76.4% (n=575,365) of the total seed assemblage are uncharred and 23.6% (n=178,092) are charred. The substantial number of uncharred seeds in the archaeological deposits could be a result of modern seed rain, percolating through the soil sequence and through tephra layers that appear to cap cultural deposits. To test whether these seeds were modern infiltrates or archaeological, AMS dates were gathered from Caryophyllaceae seeds in three sets of charred and uncharred samples (Figure 6). A sample containing charred and uncharred seed specimens were collected from a soil sample from each farm totaling in six AMS samples and 272 total seeds. These specimens were gathered from three farmsteads located in Langholt: Meðalheimer, Stóra-Seyla and Reynistaður.

From Reynistaður, 44 charred and 85 uncharred Caryophyllaceae seeds were tested from [110], sample 19 of the East Profile. This context lies between two tephra layers, AD 870 and AD 1000. The uncharred sample produced a date of 1125 ± 20 BP (cal AD 885-980 (2σ) UCI: 62869). The charred sample produced a date of 1205 ± 20 BP (cal AD 730-735 (2σ) UCI: 62807),The calibrated dates from the uncharred and charred seeds have some overlap and fall within the tephra constraints of the context.

From Stóra-Seyla, 44 charred and 85 uncharred Caryophyllaceae seeds from [194], sample 125 of excavation D were tested. These calibrated dates do not overlap. Interestingly, the charred sample provided a date of 875 ± 20 BP (cal AD 1051-1082 (2σ) UCI: 62871), which is more recent than the tephra constraints (AD 871-1000). The uncharred Stóra-Seyla sample provided a date of 1170 ± 25 BP (cal AD 776-900 (2σ) UCI: 62870

The 13 charred and 50 uncharred Caryophyllaceae seeds from Meðalheimur, [184], sample 181 of excavation A also do not overlap. The charred Meðalheimur sample falls within the tephra range (AD 1000-1104) with a provided date of 1050 ± 20 BP (cal AD 903-914 (2σ) UCI: 62868).The uncharred sample, which after preparation came to be only 0.05mgC, is more recent, with a provided date of 645 ± 20 BP (cal AD 1280-1399 (2σ) UCI: 62867).

All of the uncharred samples are at least 500 years old, and most of them calibrate to the Viking Age or Medieval Age, indicating that uncharred seeds can preserve well in the archaeological record. The radiocarbon dates from this test suggest that uncharred seeds in sealed archaeological contexts from middens in Skagafjörður are not a result of modern seed rain.

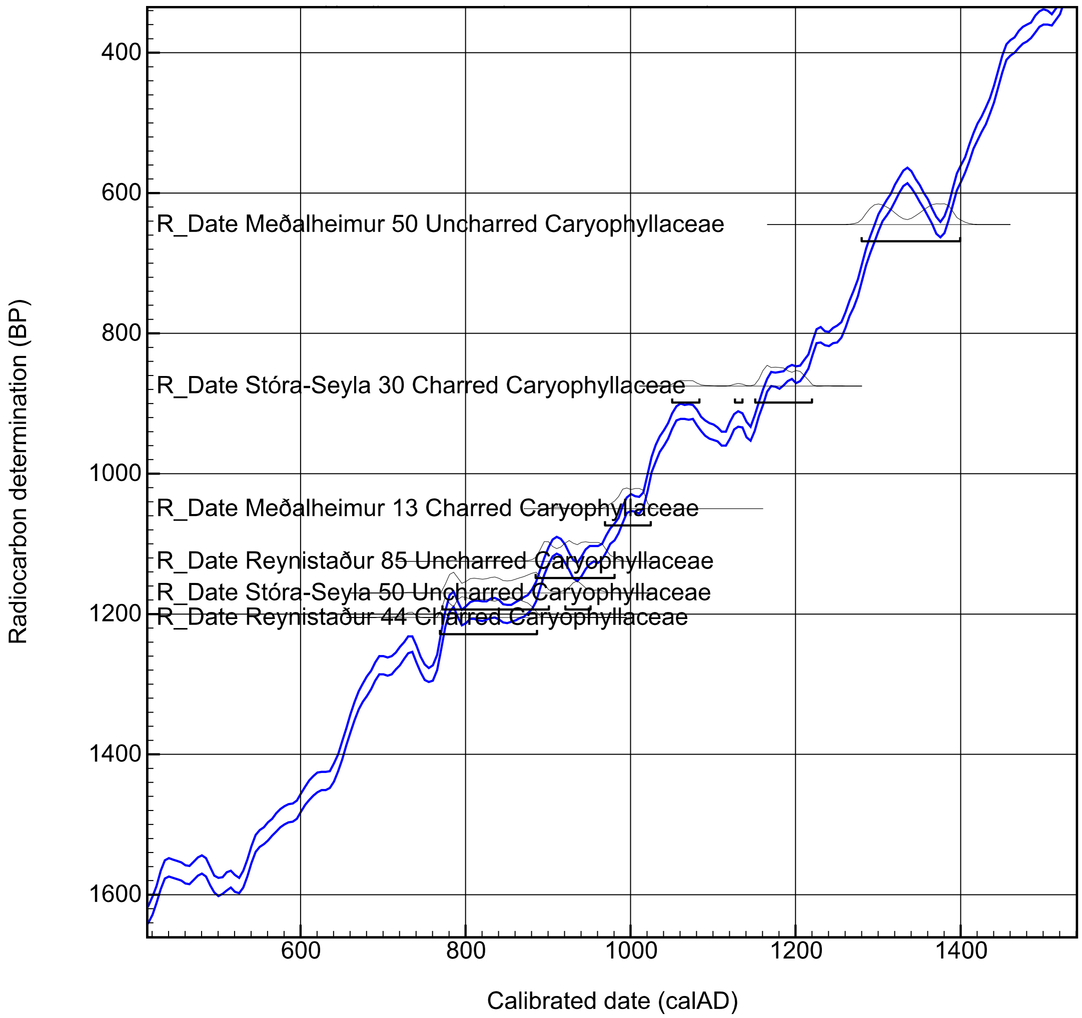


Figure 6. Radiocarbon calibration curve with dates of charred and uncharred Caryophyllaceae seeds from three different Viking Age and Medieval contexts (curve from Reimer et al 2013).

In addition to the AMS test, the general look of the of uncharred seeds suggests that they are archaeological. The antiquity of the uncharred seeds is indicated by the deterioration of the seeds and for certain species, the disappearance of the inside of seeds but the preservation of the peri-carp or seed shell (Renfrew 1973:7–8). This is especially prevalent in the Cary/*Montia* specimens analyzed.

Furthermore, the distribution of charred and uncharred seeds across time, also suggests that uncharred seeds are archaeological. If uncharred seeds were modern contaminates, there should be fewer uncharred seeds present in the earliest contexts – Prehistoric and Viking Ages – and more uncharred seeds in the later contexts – Medieval Age and Modern– assuming that the amount of modern seed rain falls off with distance from the surface. Conversely, if uncharred seeds are part of the archaeological record and associated with the contexts from which they were recovered, then there should be no overall trend of changing proportions of uncharred to charred seeds.

When analyzing the entire seed distributions in both regions collectively, uncharred seeds make up 46% (n=44) of the Prehistoric contexts, 17% (n=5,049) of the Viking Age contexts, 65% (n=6,163) of the Medieval Age contexts and 51% (n=841) of the Modern contexts (Figure 7). There is no overall trend in the percentage of charred specimens through time, suggesting a cause other than seed rain and movement for uncharred seeds.

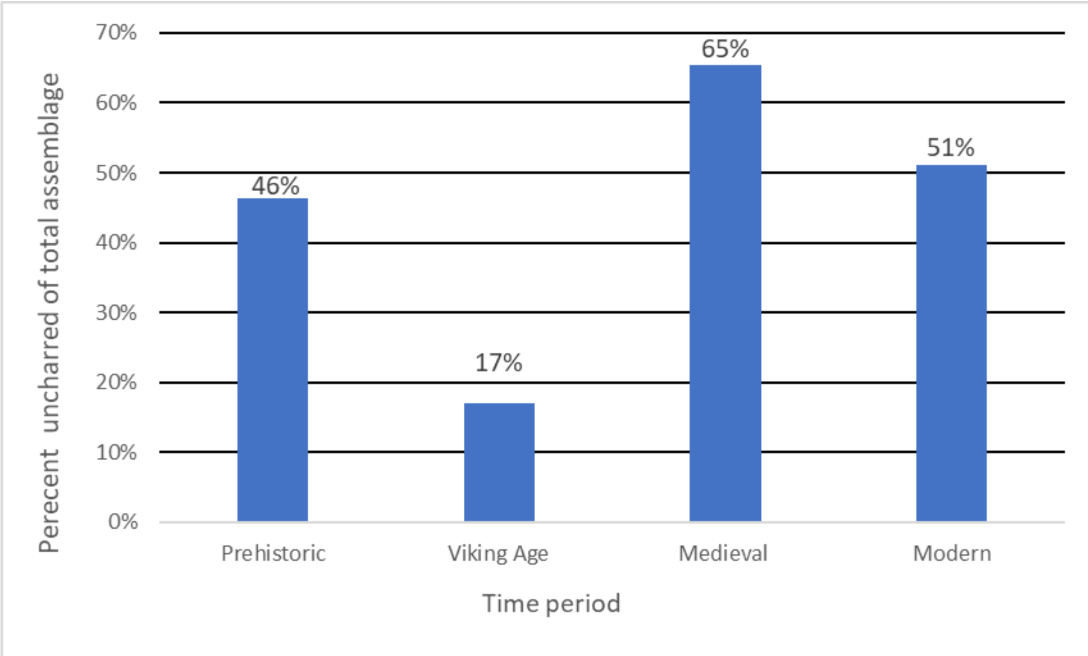


Figure 7. Bar chart of percentages of uncharred seeds for each time period (Cary/*Montia* removed).

The AMS dates, physical character, and the proportions of uncharred seeds indicate that these uncharred seeds are archaeological and not modern contaminates. Therefore, both uncharred and charred seeds are used in further analyses.

Seed deposition

Seeds and other macrobotanical remains are incorporated into archaeological contexts in various ways. Three useful categories for seed deposition described by Minnis (1981) are prehistoric seed rain, direct resource utilization, and indirect resource utilization. Using these three categories as a guide, the probable nature of the incorporation of seeds into the SCASS assemblages is determined.

Archaeological seed rain

Archaeological seed rain (called prehistoric seed rain by Minnis (1981)), occurs when plants growing near the archaeological site at the time of occupation drop their seeds. Some plants can drop vast numbers of seeds in one season. At least two taxa in the SCASS assemblages fit this model of deposition, Caryophyllaceae and P. *Montia fontana* Cary/*Montia).*

Cary/*Montia* dominate the seed assemblage. Together, the taxa make up 93% (n=701,386) of the total seed assemblage (Table 2).These taxa are highly likely archaeological seed rain and grow on or near the middens. They are charred at much lower rates that all other taxa. Additionally, they have stochastic distribution between samples and yet are remarkably evenly distributed over the region. For these reasons, these taxa are eliminated from much of the analysis.

While there are some cultural uses for both Caryophyllaceae and P. *Montia fontana* as starvation foods (Zutter 1992), the vast majority of the recovered assemblage is most likely reflective of archaeological seed rain. Stellaria *media* (chickweed), by far the most numerus identified Caryophyllaceae in the assemblage, is an apophyte that grows in disturbed, fertilized soils (Kristinsson 2013:124). Today, this weed grows abundantly on the manure piles of farms throughout the summer. *Montia fontana* (water blinks, or water chickweed) grows in wet or moist areas, especially pools, springs, meadows, or small creeks. Where irrigation ways were created on farms, or streams or pools for animal watering, *Montia* would be expected to grow and grows today (Tardío et al. 2011; Kristinsson 2013:150; EFloras 2008). Archaeological drops of seeds from these taxa would naturally be incorporated into midden deposits. This different depositional processes from other taxa in the assemblage supports their removal from analyses regarding anthropogenic practices by farmers.

As determined in the previous preservation section, although the vast majority are uncharred, they are still archaeological. That so many Cary/*Montia* specimens are uncharred also supports their removal from further analyses. For all regions and time periods the overall percent of charred Caryophyllaceae is 19.2%, while 80.8% of the specimens are uncharred. Along the same lines only 25.9% of the *Montia fontana* specimens are charred and 74.1% are uncharred. This is in stark contrast to the percentages of all other seed taxa, where the proportions are flipped (Table 6 displays charring data for Cary/Montia and all other seeds). The uncharred nature of these taxa suggests archaeological seed rain as the primary cause of incorporation into the archaeological record.

Cary/Montia have relatively similar distributions to that of all other seeds across the two landforms. The similar distributions suggest equitable preservation across the two regions. Langholt samples contain 52.4% (n=331,855) of the total Caryophyllaceae and 45.4% (n=30,751) of total *Montia fontana.* Hegranes contains 47.6% (n=301,970) of the total Caryophyllaceae and 54.6% (n=63,948) of the total *Montia fontana*. The substantial percentage of other seeds between the two regions is similar with 47.3% (n=24,565) of all other seeds in Langholt and 52.7% (n=27,368) of all other seeds recovered in samples from Hegranes. The distribution of charred and uncharred seeds along with the distribution of other seed taxa, suggests that the remaining differences are potentially due to differences in cultural and environmental processes at farms and regions rather than taphonomic or preservation processes.

Direct resource utilization

Seeds can also be deposited through direct resource utilization, defined by Minnis (1981) as resulting from the direct use, consumption and/or processing of plant materials. Heath taxa such crowberry *(Empetrum nigrum)* and bilberry *(Vaccinium spp.)* could be deposited through direct human consumption either as straight berries or for wine making (Zutter 1992; Robinson 1994). Bilberry berries could also have been used as a blue dye (Zutter 1992). Ericaceae seeds are almost exclusively found charred (98% n=34,662), which could indicate accidental burning from human consumption/processing practices. All cereals recovered are charred, also a possible result from accidental burning during consumption/processing. *Menyanthes trifoliata* has been noted by Zutter (1992) as a possible starvation food and by Robinson (1994) as a possible medicinal plant. Regular hearth cleanings onto the midden would deposit the charred remains of various pants used for human consumption.

Indirect resource utilization

Indirect resource utilization, often hard to distinguish from direct utilization, is characterized by seeds entering the macrobotanical record through the use of the plant, rather than the seed (Minnis 1981). Barn cleanings, utilitarian object production, human and livestock bedding and fuel use – turf, heath and livestock dung – are all indirect routes for seeds to enter the middens.

Samples often contain large counts of Ericaceae leaves, both charred and uncharred, sometimes without significant numbers of Ericaceae seeds. Ericaceae are heathland shrubs that typically grown along craggy cliffs that are present over much of the Skagafjörður area. The leaves and shrubbery were often collected for human and animal bedding (Robinson 1994). Most livestock do not feed on heathy shrubbery, although I have seen Icelandic horses enjoying the berries. The Ericaceae leaves were most likely not deposited through animal waste. Charred heath taxa seeds, in addition to direct human consumption, could also have been deposited through the burning of the shrubbery bedding and turf, either accidently or purposefully. Likely, the seed and leaf deposition are a combination of all these processes. Some wetland taxa may have been utilized as bedding, ropes, and other utilitarian objects, and their seeds indirectly deposited into the middens (Robinson 1994).

The majority of the assemblage is consistent with livestock waste, whether through barn cleanings depositing uncharred seeds or the waste used as fuel being deposited onto the farm mound through hearth cleanings. Farmers often had to supplement or even replace wood fuel resources with dung and peat for cooking and heating (Bergthórsson et al. 1985:419; Simpson et al. 2003). In modern times, smoking of meat from burning sheep dung is a common practice, specifically for *hangikjöt* (cold-smoked Icelandic lamb meat) (Toldrá et al. 2008:510). These practices would deposit charred seeds into the farm mound middens.

A substantial precentage of the seed assemblage is charred (71.3%) and is made up of mostly of sedges, grasses, heathland species, and apophytes. These taxa are common constituents of grazing lands and the resultant animal dung.(Ross and Zutter 2007) The presence of charred dung clinging to seeds (Figure 8) and loose in samples, along with the diversity and abundance of these weed species, would suggest grazing and/or foddering of animals, and the dung from these animals collected and used for fuel (Charles 1998; Wallace and Charles 2013). The presence of dung in the assemblage also supports the interpretation that the majority of seeds in the sampled assemblages are deposited into the midden as the residue of burnt animal waste (Trigg et al. 2009).

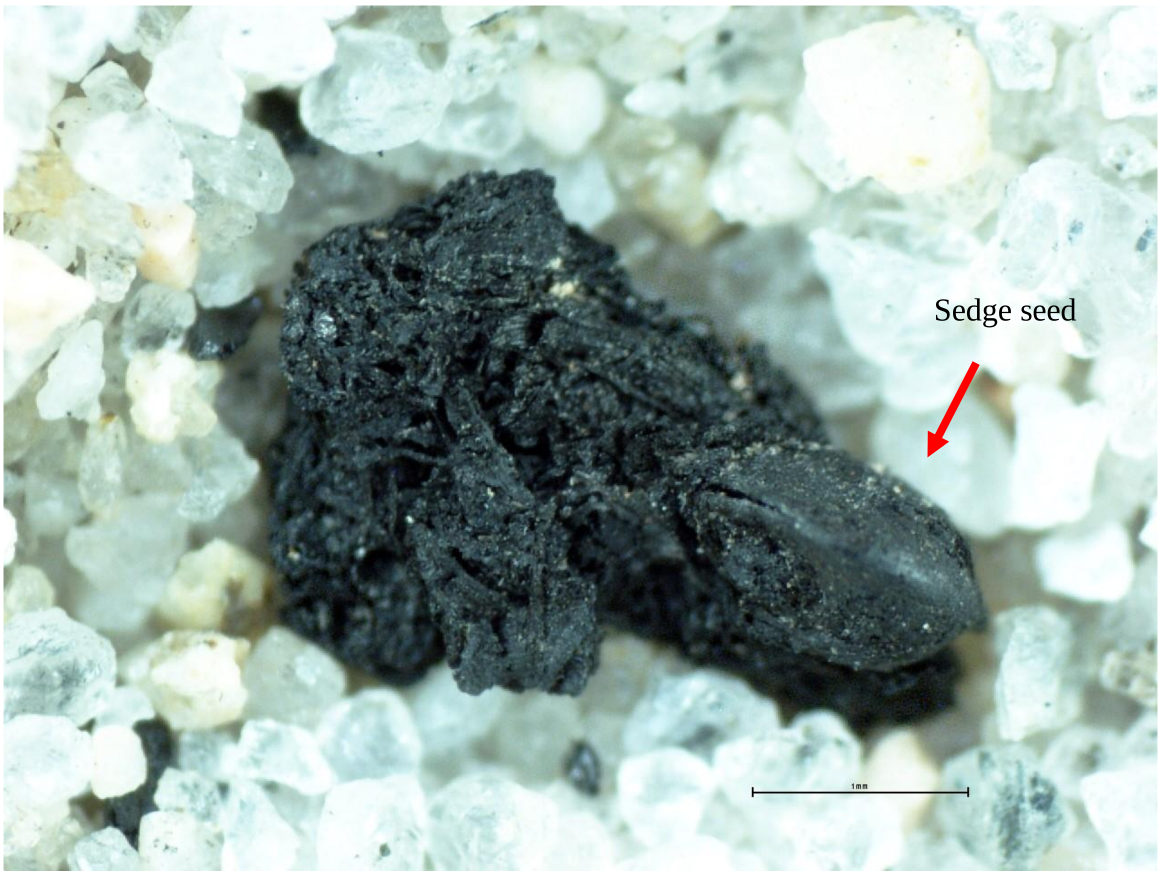
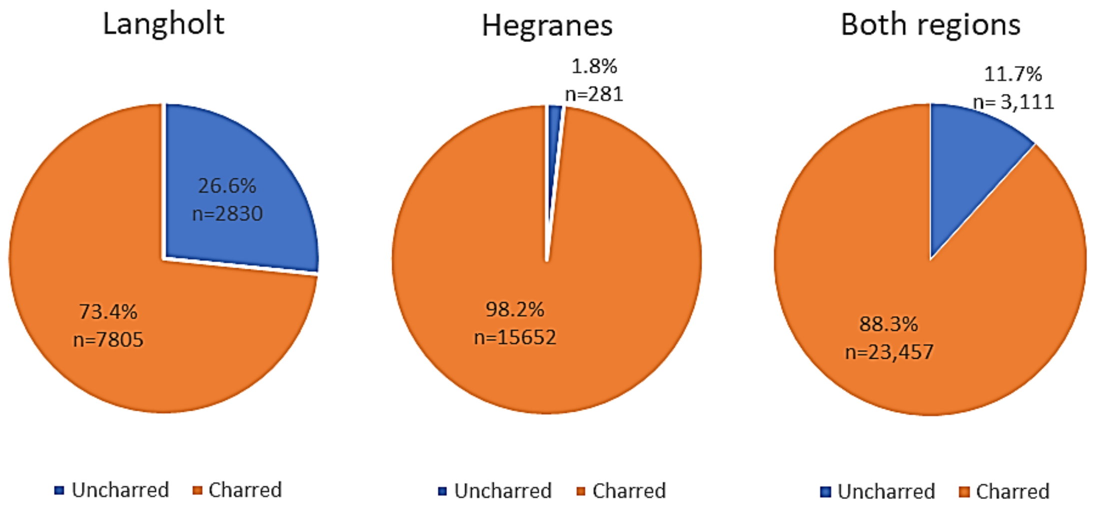


Figure 8. Photo of charred sedge seed embedded in charred dung recovered from a floatation sample. (Photo by author, 2019)

Poaceae (grasses), Cyperaceae *Carex* (sedge) and some apophytes such as *Cerastium* (chickweed) were collected as hay fodder from the homefield (*tun*) or the surrounding wetlands (Zutter 1992). Weed seeds of fields would be present in the fodder (the other apophytes, ex: *Rhinanthus*, *Polygonum*). Whether sedges other than *Carex* were being collected for fodder is unknown, but animals would graze on both wetlands and grasslands (Ingvason 1969; Fridriksson 1972; Ross and Zutter 2007). Wetland vegetation was used in Denmark during the Viking Age for animal grazing and for winter fodder as bog hay, which supports its use as forage in the Icelandic assemblages (Robinson 1994). Deposition of these seeds in the middens most likely occurred from the burning of livestock dung for fuel (charred seeds) or the sweeping and cleaning out of barns onto the midden (uncharred seeds) (Ross and Zutter 2007).

The charred percentages of these typical fodder and grazing species also indicate dung for fuel. For example, 98.7% of the sedge in Hegranes are charred and 63.0% are charred in Langholt. 96.7% of grasses are charred in Hegranes and 84.7% are charred in Langholt (Figure 9). This charring distribution of key forage taxa indicates dung as fuel and a key source of seeds in the middens. Therefore, other than the flora discussed below, there is evidence to interpret the deposition of the seed remains, and those of specific taxa that are heavily discussed in this thesis (grass – both wild and cereals – sedge, and some of the heath species – crowberry) in the middens are coming from dung burning and therefore representing the animal husbandry practices at the farms.



Langholt	Charred	Uncharred
Poaceae	4,320	782
Cyperaceae	3,485	2,048

Hegranes	Charred	Uncharred
Poaceae	15,652	114
Cyperaceae	3,291	167

Both	Charred	Uncharred
Poaceae	7,611	896
Cyperaceae	15,846	2,215

Figure 9. Pie charts of charred and uncharred seeds of forage taxa (Poaceae and Cyperaceae) from Langholt, Hegranes and both regions from combined Viking and Medieval Age Midden contexts. (Chart by author, 2019)

Seeds, therefore, can be deposited through a variety of cultural activities, including archaeological seed rain, direct human utilization, and indirect utilization such livestock waste fuel. The main categories of seeds analyzed in this thesis fall under the field and wetlands categories which most likely were deposited through burnt animal waste. This postulate implies that the majority of the archaeological seed assemblages is reflective of past hay foddering and grazing practices. While many factors contribute to the variation in the seed assemblage, changes in the ratios and densities across the landscape and through time should primarily be a proxy for how livestock foraging practices changed.

Charred cereals

Three hundred and seventy-four total cereal grains were identified in the midden contexts. Of these cereals, 241 were identified as barley. The lack of other cereal plant fragments such as rachis (although present in four samples) could be due to a preservation problem (these plant parts are easily susceptible to deterioration, much more so than grains), or animal digestion (Charles 1998; Wallace and Charles 2013). The lack of fragments could also indicate that cereal grains were coming into those farmstead midden contexts already cleaned and processed. That being said, the basic framework of this thesis is that where barley is present at a farm, it is because it was grown locally at that farm. Pollen cores, rachis presence, and the abundance of cereal weed species and the broad distribution of cereal grains all strongly suggest the local production of barley (Trigg et al. 2009). It is likely that this production was occurring at most farms where barley is present in the assemblages.

The charred nature of the barley (and other grasses) could result from several different human activities. Direct utilization - during preparation of barley for beer production, the grain is roasted after sprouting. During roasting, some accidental charring could have occurred. Additionally, if barley processing or cooking occurred within the household, sweepings could direct some seeds along with other byproducts into the fire, and thus into the middens when the fires were cleaned out. A third possibility, through indirect resource utilization, and the most likely scenario for most of the grains, is that after harvest (and possibly after gleaning—if that occurred in Iceland), farmers let their animals graze on the homefield stubbles (Øye 2004:113; Trigg et al. 2009). There are a couple of benefits to this practice. One, it is an additional source of food for the animals, and of a higher nutritional value than the grasslands. Second, the grazing of animals on the fields allowed for their waste to be quickly distributed onto said fields. Third, the animals' movement and trampling of the fields turned the soil and incorporated the manure into the land. In this region, we have no evidence of rye grown as a secondary crop to barley as it was done in Scandinavia (and possibly southern Iceland), therefore freeing up fields for grazing in the few short weeks after the barley harvest before the first signs of winter (Robinson 1994; Grabowski 2014).

Diversity and Evenness

Diversity and evenness calculations provide a general view of the composition of seed assemblages that can be used to understand intensification, foddering versus grazing, and exploitation of surrounding environments (Popper 1988:66–67). Diversity numbers were calculated using a Shannon Diversity Index, determined by the equation:

$$H = \sum - (Pi * \ln Pi)$$

$i=1$

where:
H = the Shannon diversity index
Pi = fraction of the entire population made up of species i
S = numbers of species encountered
∑ = sum from species 1 to species S
ln=natural log
Higher diversity index numbers indicate higher diversity, lower index numbers indicate lower diversity.

The Shannon-Weaver Diversity Index gives a very general measurement of the diversity and evenness of a plant assemblage (Pearsall 1989:137). It integrates the total number of taxa in an assemblage and the relative abundance of each of those taxa. Higher diversity index numbers indicate higher diversity (many taxa contribute to the assemblage), lower index numbers indicate lower diversity (assemblage dominated by a few taxa). There are some difficulties when it comes to this analysis. For example, two samples could have a very similar diversity measurement but have different distributions of those taxa. This makes it a decent measurement of the broadest trends in generalized (diverse) assemblages rather than in specialized assemblages (Popper 1988:67–68).

Shannon-Weaver Diversity Index scores were generated for all the seed assemblages from all sites to get the broadest understanding of the distribution of taxa across the sites that would direct further analyses to understand the variation of production strategies and the factors impacting these strategies such as if there is a difference in diversity between regions (Langholt and Hegranes), places with barley or without, and between farm sizes (big and small, a proxy for wealth and productivity). Pearsall (1989:137) believes that taxa with lower than ten seed counts could lead to inaccurate results. I accepted the risks of these possible inaccuracies because it appears that preservation is consistent across analytical units but have removed sites with only one taxon represented (445-2 and 445-4). The results of Shannon-Weaver Diversity index are organized by region, farm number, the diversity (H) and evenness (E) measurements, whether barley is present or not, farm), and the Viking Age measurement the farm midden area (Table 13 for Langholt and Table 14 for Hegranes). In general, all of the diversities for farms are quite low, but there is a fairly large difference between the highest and lowest diversity scores: 0.54 (at 450-2) and 1.84 (at 452-0).

Table 13
Shannon-Weaver Diversity Index measurements for each farm in Langholt. Barley presence, farm size and Viking Age midden area are listed.

Farm Number	Diversity Index (H)	Evenness (E)	Barley Presence	Farm Size	Viking Age Area (m^{2})
57-0	1.61	0.73	Yes	big	3326
59-0	1.40	0.59	No	small	2455
60-0	0.92	0.44	No	big	4593
61-0	1.29	0.56	No	big	3564
62-0	1.24	0.69	Yes	small	2745
63-0	1.59	0.51	Yes	big	7573
104-1	1.17	0.49	Yes	big	7079
106-0	1.24	0.77	No	big	2064
109-0	1.01	0.46	No	small	1537
111-1	1.21	0.44	Yes	big	3597
115-1	1.18	0.57	Yes	big	7209
1006-0	1.75	0.55	Yes	big	4691

Table 14
Shannon-Weaver Diversity Index measurements for each farm in Hegranes. Barley presence, farm size and Viking Age midden area are listed.

Farm number	Diversity Index (H)	Evenness (E)	Barley Presence	Farm Size	Viking Age Area (m^2)
440-0	1.30	0.62	No	small	1,139
442-0	1.53	0.49	Yes	big	12,167
442-1	0.75	0.36	Yes	small	481
442-2	0.56	0.31	No	small	258
442-4	1.01	0.46	No	big	1,967
443-0	1.21	0.37	Yes	big	3,539
444-0	1.53	0.69	No	big	4,682
444-1	1.21	0.43	No	big	2,139
445-0	1.76	0.73	No	big	4,866
445-3	0.57	0.25	Yes	small	135
445-6	1.17	0.51	Yes	big	3,752
446-0	1.48	0.56	Yes	big	4,376
447-1	1.43	0.46	Yes	small	465
447-2	0.64	0.29	Yes	small	158
447-4	1.48	0.62	Yes	big	4,823
449-0	1.44	0.58	No	big	5,887
450-0	1.08	0.55	No	big	13,041
450-1	0.83	0.43	Yes	small	742
450-2	0.54	0.28	Yes	small	45
451-0	1.70	0.65	Yes	big	15,265
451-1	0.69	1.00	Yes	small	29
452-0	1.84	0.57	No	small	908
455-1	1.27	0.58	Yes	small	1,305

Independent t-tests calculated an averaged H measurement for all sites (n=35) of 1.22 (SD=0.36). The E measurement for all the sites (n=35) averaged 0.53 (SD=0.15). Regional diversity and evenness measurements were analyzed to understand if there is any major variation in seed assemblages at places between regions – between Langholt and Hegranes. For Langholt (n=12), the H measurement averaged 1.30 (SD=0.25), and the E measurement averaged 0.57 (SD=0.11). For Hegranes (n=23), the H measurement averaged 1.17 (SD= 0.41), and the E measurement averaged 0.51 (SD=0.17) This data is presented in Table 15.

Table 15
Results of independent t-tests on diversity (H) and evenness (E) measurements by region. Includes both time periods.

<table>
<tr><td colspan="2"></td><td colspan="5">Diversity (H)</td><td colspan="5">Evenness (E)</td></tr>
<tr><td>Region</td><td>N</td><td>Mean</td><td>SD</td><td>t</td><td>p</td><td>df</td><td>Mean</td><td>SD</td><td>t</td><td>p</td><td>df</td></tr>
<tr><td>Hegranes</td><td>23</td><td>1.17</td><td>0.41</td><td rowspan="2">1.14</td><td rowspan="2">0.26</td><td rowspan="2">32.08</td><td>0.51</td><td>0.17</td><td rowspan="2">0.98</td><td rowspan="2">0.33</td><td rowspan="2">33</td></tr>
<tr><td>Langholt</td><td>12</td><td>1.30</td><td>0.25</td><td>0.57</td><td>0.11</td></tr>
<tr><td>Regions combined</td><td>35</td><td>1.22</td><td>0.36</td><td colspan="3"></td><td>0.53</td><td>0.15</td><td colspan="3"></td></tr>
</table>

Although Langholt has a diversity (M 1.30, SD 0.25) slightly higher than Hegranes (M=1.17, SD=0.41), this is not a significant difference of the mean diversity measurements, conditions; t(33.62)=1.50, p=0.142. This is also reflected in the evenness measurements. There is no significant difference between evenness in the seed assemblage between Langholt (M=0.57, SD=0.11) and Hegranes (M=0.51, SD=0.17) conditions; t(33)=0.98, p=0.334. These statistics suggest that the distribution of seed taxa across regions are relatively similar, even though grass and sedge dominate assemblages (cf.Csergo et al. 2013).

The presence of barley does not seem to impact taxa diversity and evenness either. Barley-present sites (n=21) and barley-absent sites (n=14) displayed no significant difference in the average diversity and evenness measurements. There is not a significant difference of the mean diversity measurements, conditions; t(35)=0.49, p=0.63, or of the mean evenness, conditions; t(35)=0.74, p=0.47 (Table 16). This suggests that the diversity and evenness of the seed assemblages at farms with barley and those without are not different. Importantly, this shows that barley production does not impact the diversity and evenness of other seeds in the assemblage.

Table 16
Results of independent t-tests on Diversity (H) and Evenness (E) measurements in relation to barley presence. Includes both regions and time periods.

		Diversity (H)					Evenness (E)				
Barley	N	Mean	SD	t	p	df	Mean	SD	t	p	df
present	21	1.19	0.38	1.49	0.63	33	0.51	0.17	0.74	0.47	33
absent	14	1.25	0.34				0.55	0.13			
Combined	35	1.22	0.36				0.53	0.15			

This chapter reviewed the many analyses conducted that first, addressed unique preservational contexts which skewed the dataset; second, determined the depositional processes of the taxa analyzed; and third, investigated the diversity and evenness across regions, sizes and barley-present farms. In summary, two taxa Caryophyllaceae and P. *Montia fontana* were determined to have a different depositional and preservational environment than the rest of the taxa and were removed from further analyses. The charred status of the remaining seed assemblage was examined, and this charring in addition to the flora assemblage determined the deposition of most seeds as representative of dung used for fuel. Other taxonomic depositions were reviewed, and the diversity and evenness of this assemblage was examined. Overall, there is remarkably very little variance in diversity and evenness across the landforms, supporting the interpretation that most all farms were utilizing a similar suite of flora that were then deposited into the middens in comparable ways.

CHAPTER 6

DISCUSSION

Macrobotanical datasets can be analyzed in a variety of ways. Distribution and ubiquity are determined from the presence and absence of taxa at sites. This type of analysis uses whether a taxon is recovered or not and is not standardized by volume or percentage. Densities are a standardized measure obtained from the seed count divided by the total volume of floated material (for this thesis, liters). Proportions are another standardized measure where the count of seeds from a taxon is divided by the total number of seeds found, providing the relative proportion that taxa makes of the assemblage.

This chapter explores the variation in the Icelandic farmers' production strategies through the analysis of the distribution of barley, its correlates, and more significantly, its non correlates; differences in the proportion of taxa in assemblages between regions and across time and those on farms with barley; the possibility of using comparative densities across sites to look at the reduction in occupation or production over time; and to conclude, two case studies that explore further the variation in production strategies – with a focus on cereal production, its impact on livestock forage and what this tells us about the social structures of the early Icelanders.

Barley distribution

Barley is found regularly in Viking Age contexts across the study regions and among farms of varying sizes and is potentially underrepresented in our current dataset. The implications of this ubiquity are profound as barley has been previously interpreted as a prestige good correlated with high-status (Sveinbjarnardóttir 2012; Zori et al. 2013; Riddell et al. 2017). This section examines the distribution of barley through its presence at over half the sites sampled and statistical analyses of its presence in relation to other taxa, farms size and status.

Regional Barley Distribution

Barley was recovered from midden contexts of 19 farms out of 42 farms (45%) (barley was recovered from two more farms from contexts other than middens, bringing the total farm presence to 22, 54%). A total of 219 barley grains were recovered from Viking Age midden contexts of 19 farm sites (Table 11). Figure 10 displays the farms with barley present in middens (green triangles), farms where barley is present but not in midden contexts (white triangles) and farms that barley was not recovered (white Xs). From this geographical display of barley presence and absence, it is apparent that barley does not cluster in any particular area and is represented quite well across the two regions.

Given the regionally extensive but small-scale sampling of individual sites, it is also highly probable that this is an underrepresentation of the number of farms with barley. Sampling errors may have missed recovering barley with our minimum 1x1m excavation units by simply not placing the unit in the right location in the midden or not having a large enough excavation. Barley may be even more ubiquitous than our data is presently showing us.

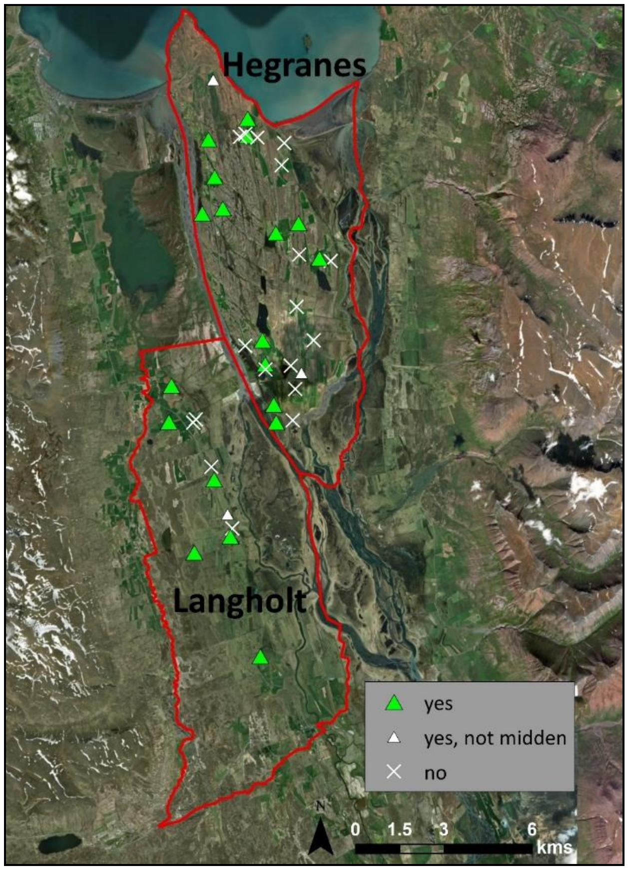


Figure 10. Air photo of research area with farm locations superimposed and symbolized by barley presence. Green triangles represent farms where barley was recovered from midden contexts, white triangles where barley was recovered but not from midden contexts (and not used in analyses), and white Xs where barley was not recovered. (Figure by author, 2019)

Additionally, barley is recovered at more farms than would be expected given the total number of grains. This is determined through a correlation analysis of all taxa present in midden samples. The total number of seeds of a given taxon varies with the power of the number of places that taxon is found. This relationship produces a curve with a very long tail as only a few taxon (3.6%) makeup the majority (70%) of the total seeds recovered, as seen in Figure 11. The curved relationship of the place-taxon power log scatter plot can be made linear by using a logarithmic (log) scale for each axis, Figure 12. The correlation of total seeds of a taxon to the count of places that taxon is present is very strong (R^2=0.811). This means that 81% of the variation in the number of places taxa occur can be explained by the total number of the respective taxa.

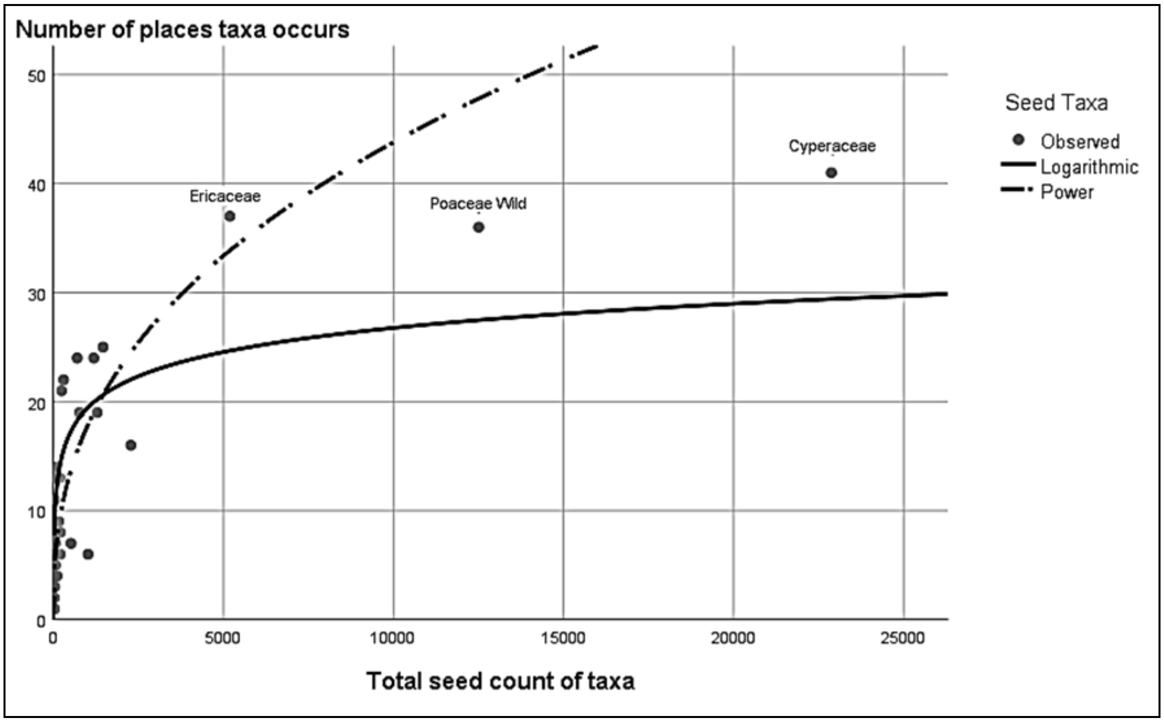


Figure 11. Scatter plot with log-normal (logarithmic) and log-log (power) regression lines with number of places taxa occur vs. total seed count of taxa. Three taxa with the highest seed and place count are labeled. (Graph by author, 2019)

In general, taxa above the regression line are found at more places given their total number of seeds. In other words, taxa above the line have lower numbers of total seeds than would be expected given the number of places they were recovered from. Taxa below the line have more total seed counts than would be expected given the number of places that the taxa are recovered from. Some taxa fit the model expectations. For example, *Taraxacum* *autumalis* exhibits close to the expected occurrence. *T. autumalis* has a total of 161 seeds recovered from 9 places (error of 0.32). The error distances from the expected (fit) line can be seen in Figure 12.

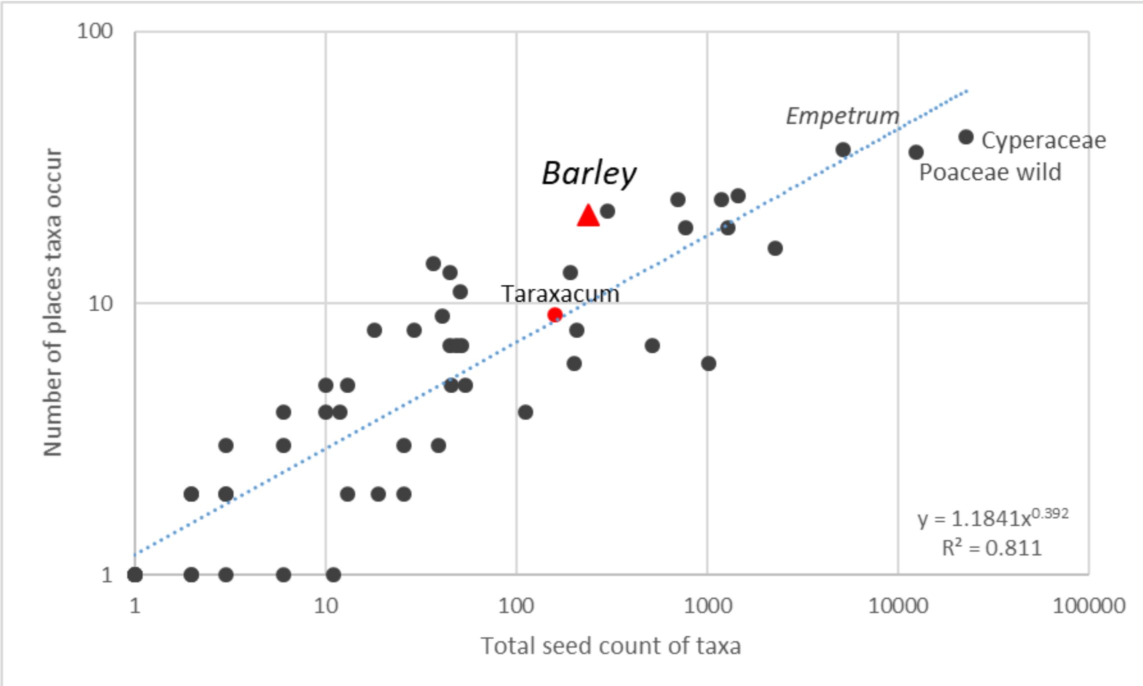


Figure 12. Scatter plot with log-log relationship (power) of number of places taxa occur vs. total seed count of taxa. Barley is highlighted red and labeled with the triangle, *Taraxacum autumalis* is highlighted red. R^2 of the power line is 0.811. (Graph by author, 2019)

Barley is one of those taxa that is far above the line, specifically barley has the second greatest positive error distance from the fit line (10.85), Figure 13. The number of places barley occurs is much greater than would be expected of the 240 total seed counts recovered from 21 places. With a count of 240, the linear fit line of a power relation would suggest recovery at 10.88 places. Barley is found at double that.

The possible sampling size errors and the correlation analysis suggest that barley is both recovered from fewer sites than it is likely present at while at the same time overrepresented at the number of recovered sites. These both further support the argument of the taxa's ubiquity across the SCASS farms.

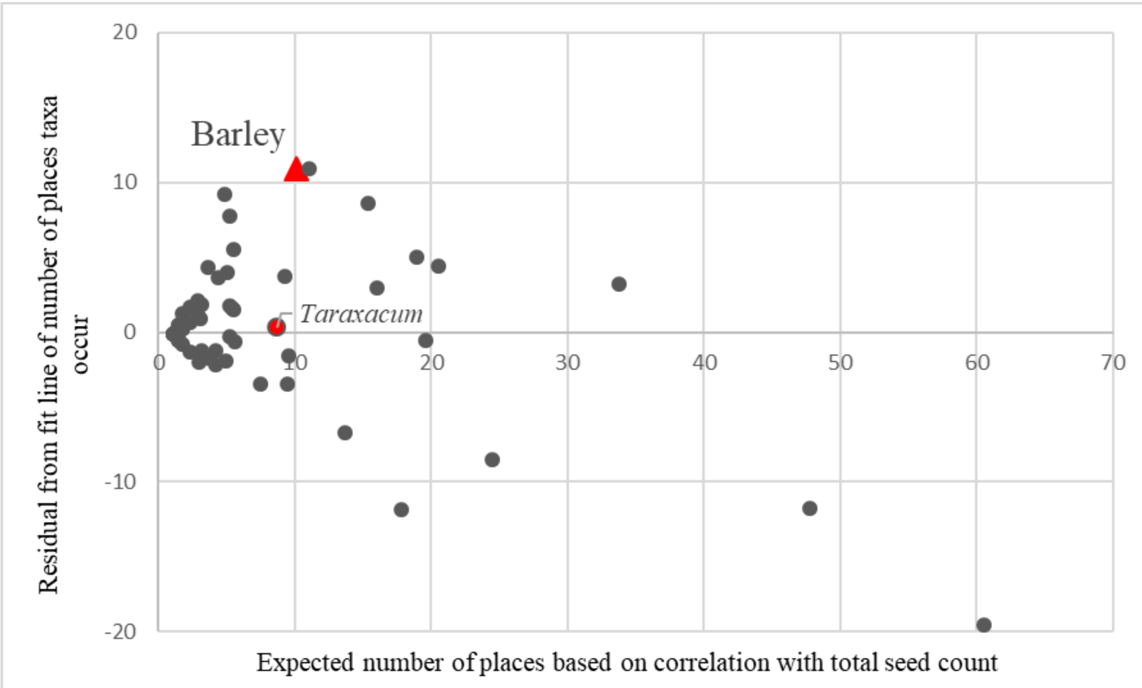


Figure 13. Residual graph of number of places taxa occur vs the expected total number of places (based on total number of seeds per taxa). Barley is highlighted red and symbolized with a triangle, *Taraxacum autumalis* is highlighted red. (Graph by author, 2019)

Independent t-tests of the mean barley densities between the regions further supports the ubiquity of barley across Skagafjörður. The analysis compared the mean densities of barley from all farms with barley present to the total floated liters for all midden contexts in the Viking and Medieval Ages. Results show that there is not a significant difference in mean barley densities between regions when all midden samples are analyzed (Table 17).

Table 17
Mean densities of barley by time period and region.

Mean barley density (barley/liter)	
Viking Age	
Langholt (n=235)	0.09
Hegranes (n=207)	0.07
Medieval Age	
Langholt (n=156)	0.01[a]
Hegranes (n=44)	0

Note: n=number of samples analyzed
[a] The Medieval barley identified are all from insecure contexts or have Viking Age radiocarbon dates.

The distribution of barley across the regions, both its underrepresentation from sampling errors and its overrepresentation at sites recovered, and the lack of significant differences in mean barley densities suggests that barley is much more ubiquitous than would be expected of an intensified, prestige good. Rather, barley's distribution across the Skagafjörður locale implicates the Norse farmers adaptation of a basic Scandinavian agricultural practice of cereal cultivation to the Icelandic environment.

Barley, Farm Size and Status

As demonstrated, barley is distributed fairly equally across the study area when looking at a very general overview of barley presence or absence. To test the association of barley with status, barley presence was compared with a categorical farm size (big or small). The size category of a farm is determined by taking the average Viking Age mound area meter^2 of all farms for each region. The area of the farm mound was determined by coring data, measuring the extent and depth of cultural presence. Farm areas that fall above the average for each region were considered big farms and those below small. This relative average is different for the regions. For Langholt, this average area is 3,174 m^2; for Hegranes it is 1,683 m^2. This archaeological measurement of farmstead size is demonstrated to be a good proxy for historical farm wealth and productivity (Steinberg et al. 2016). Farmstead size is extrapolated as a very generalized conception of wealth and status in the Viking Age, assuming that a larger farm is wealthier and of higher status than a small farm. Bivariate correlation analyses determined that there is no correlation of barley with the size of a farm. Big farms are not statistically more likely to have barley present than small farms. Figure 14 displays this geospatially and Table 11 displays these data. From this we can see that there is a fairly random distribution of barley presence across both sized farms. Importantly, 11 big farms (13 if you include the 2 farms where barley was recovered from contexts other than middens – represented by the white triangles) across the two regions have barley present, while 10 big farms do not. 8 small farms have barley present and 8 small farms do not. Hegranes has more small farms overall and more small farms with barley. Langholt only has three small farms in total, with one with barley present.

Evidence of malting and beer production is difficult to find in the archaeological record (Stika 1996). Large collections of deliberately sprouted grains are a strong archaeobotanical indicator of beer production (Stika 1996; Valamoti 2018). No sprouted cereal grains were identified in the SCASS assemblages. However, sprouted grains would not be present if the barley is deposited through animal forage as these assemblages most likely were. The lack of sprouted grains, then, cannot rule out the possibility of beer production at these sites but also may suggest other uses for the grain, such as porridge as was used by the

Norwegians at this time (Myhre 2004:56). The regularity of the barley points towards cereal production as part of a more common subsistence strategy.

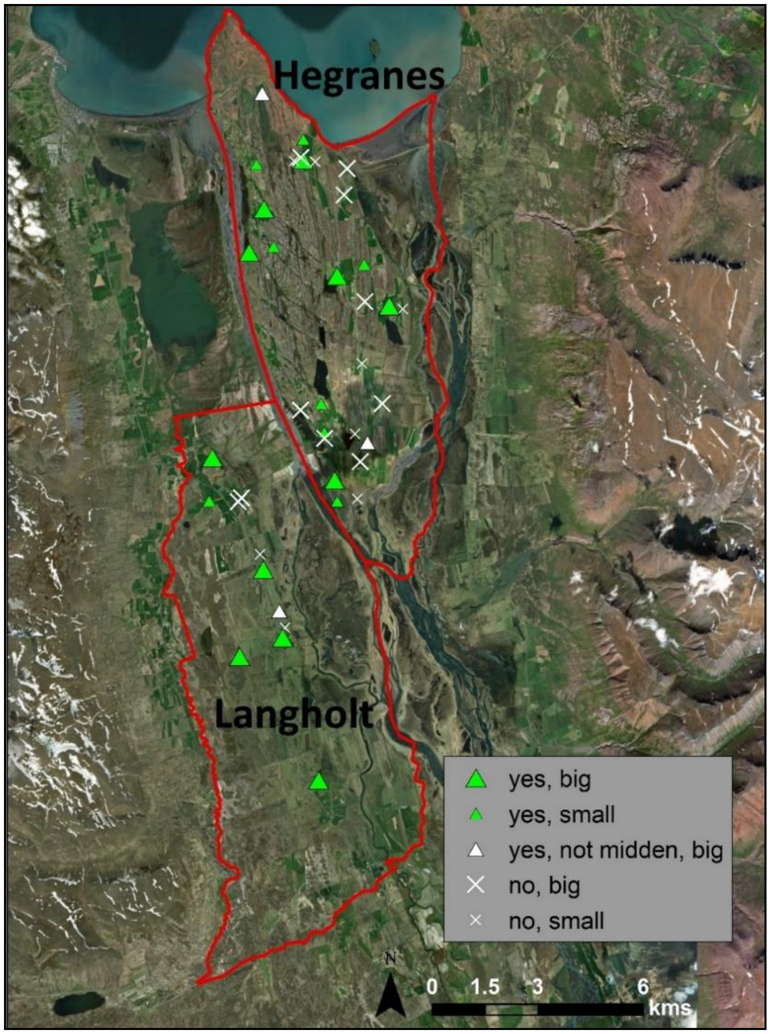


Figure 14. Air photo of research area with farm locations superimposed and symbolized by barley presence per farm size. Large green triangles indicate big farms with barley, little green triangles represent small farms with barley, and the white triangles represent barley presence in contexts other than middens at big farms. White Xs of both sizes represent farms where barley is not present. (Figure by author, 2019)

While further research is required to understand the social, political or economic control over barley production and consumption, the ubiquity of barley presence across farms of varying sizes demonstrates that barley is not a good proxy for high-status as Riddell et al. (2017) argue. The regular recovery of barley may indicate that barley production and consumption was part of a more general subsistence strategy than solely beer production, until its cessation around 1104 AD, nearly 300 years prior to its stop in southern Iceland (Riddell et al. 2017). The cereals' presence at over half the farms in the Skagafjörður region complicates the concept of a restricted, prestige good only cultivated by farms that had the status, wealth and labor to produce the crop.

Barley production was labor intensive and required dedicated time into a production strategy that did not guarantee a successful harvest each season. Its ubiquity across the region demonstrates that the relationship between farms and barley production is not as simple as only high-status farms producing the crop, but that the early farmers attempted to introduce the full Scandinavian agricultural package to Iceland. Either most farms were able to independently produce barley or there was a much more complicated socio-political and economic relationship between farms in Iceland that organized the maintenance and harvest of such a labor intensive agropastoral practice.

Possible oat cultivation

While the cultivation of oats (*Avena*) was integral to the Scandinavian subsistence strategy (Robinson 1994; Grabowski 2014; Øye 2009), the recovery of this cereal is rare in Icelandic assemblages. The taxon has been recovered at three other sites in Iceland: Hofstaðir (Guðmundsson 2009), Hrísheimar (Bold 2012), and Lækjargata (Mooney 2017), but in small numbers, never over ten seeds. These, along with the majority of Icelandic barley, come mainly from excavation of singular longhouses.

Oats can be a normal contaminant of barley seed stock and are usually thought of as weeds of barley fields in Icelandic assemblages, especially as it has been believed the climate in Iceland was not suitable for oat cultivation. In the study area, 48 oat grains were recovered from various context types, primarily midden deposits, across 6 farms in the study area (4 from Hegranes, 2 from Langholt) (Figure 15). For 6 of the 7 sites with oats present, a weedy oat signature seems likely, with low numbers of oats and higher numbers of barley. However, the cereal data suggest that weedy oats may have comprised a greater proportion of the SCASS cereal assemblage, perhaps by as much as an order of magnitude. Additionally, at the site of Grænagerði the proportions of oats to barley in the assemblage seem to reflect cultivation of oats.

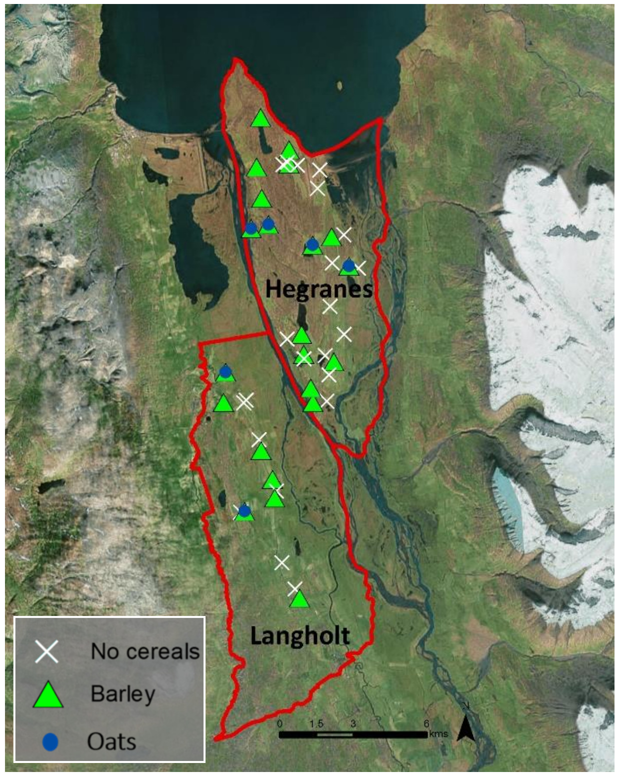


Figure 15. Air photo of research area with farm locations superimposed and symbolized cereal presence: barley (green triangles), oats (blue circles) and no cereals (white Xs). (Map by author, 2019)

An example of a weedy oat signature is provided by Gardar Guðmundsson (2009). In a modern Icelandic barley growing experiment, Gardar found that oats made up 0.6% of an organic barley seed stock received from Professor Roger Engelmark's traditionally cultivated farm in Umeå, Sweden. This 0.6% then is a rough baseline for the ratio of weedy oats to barley, and other paleoethnobotanical studies in Iceland have found similar oat to barley ratios (Bold 2012; Mooney 2017).

Figure 16 displays the proportions of each cereal type for the case study sites and the regional assemblage. When looking at the total cereal assemblage from all farms in our study area, oats make up 16%. Grænagerði represents an outlier in that it has a much higher number of oats, and if it is excluded, oats represent 7% of the total cereal assemblage. At another case study site representing a normal weedy oat signature, Vatnskot, oats make up 6% of the cereals. This 6-7% regional weedy oat signature is an order of magnitude above that of Gardar's 0.6%. The reason for this proportion is unclear but is likely reflective of the high ubiquity of barley production in the area.

At Grænagerði, however, oats represent 49% of the cereals, significantly higher than Vatnskot and the overall, regional assemblage. At Grænagerði, the oat distribution suggests a different anthropogenic process that is not a result of the weed signature seen elsewhere. There are a few explanations for the high proportion of oats at Grænagerði, including the accidental burning of an oat seed stock or a very fine cleaning of a barley crop.

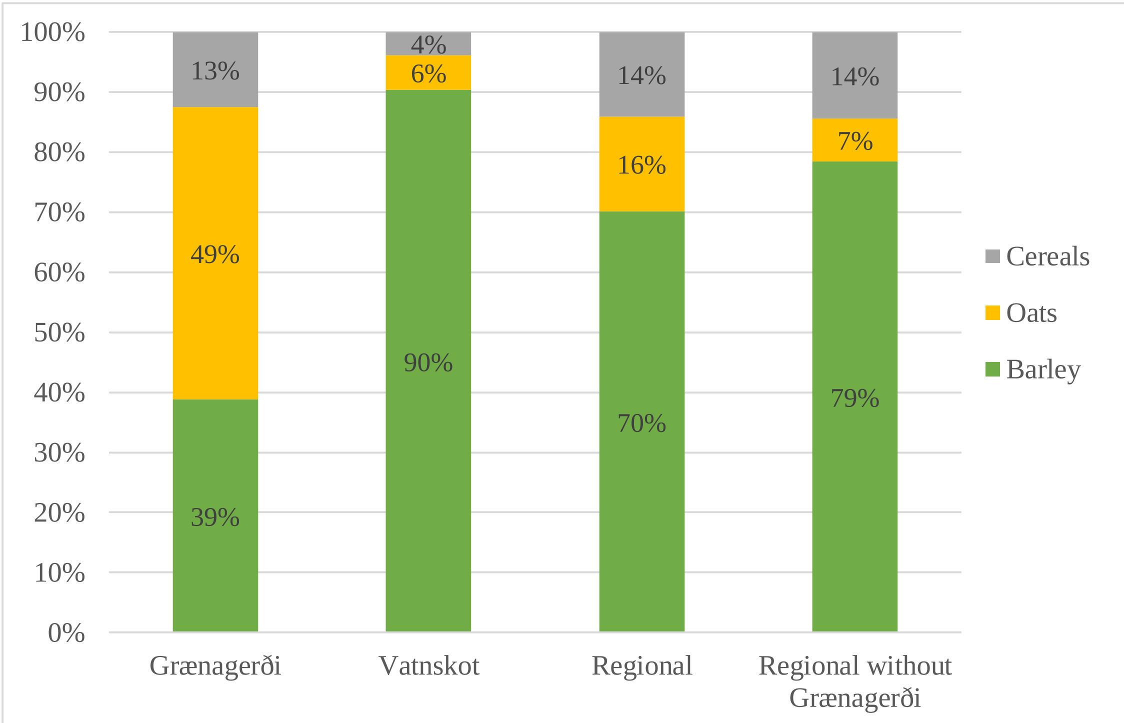


Figure 16. Bar chart of comparative cereal percentages at case study sites with regional distribution for comparison. (Graph by author, 2019)

However, it is possible these grains are the remains of an attempt at growing oats by newly arrived farmers occupying this site in the Late Viking Age, possibly for feed for livestock. The lower densities of typical forage taxa (sedges and grasses) may indicate an intensified cereal production strategy, or the farm is a cereal processing center, with the cereals grown at a nearby farm. Further research is needed to see if the intensification or processing of cereals, by such a small, marginal farm is part of a larger inter-farm economic and social relationship – possibly a tenant social structure that is beginning to appear in the Late Viking Age, before its full-blown appearance in the Medieval Age. The first appearance of tenancy is cited in the 11th century - *Grágás* (Byock 1988:99).

Variation in livestock forage practices

Hay foraging was the driving force and foundation of the Icelandic economy. The productivity of the land was used as a measure of the overall success and wealth of farms. The main productive product of farms were animal livestock, which directly related to the ability to harvest hay forage. Hay forage was a political, economic and environmental variable in Norse society. Historically, tax records called *Jarðabóks* (Icelandic Land Register complied in the 18th, 19th and 20th centuries) rated farms by their forage reserve value. (Johnsen 1847; Magnússon and Vídalín 1930; Pálsson 2001; Pálsson 2010). Animals transformed the land – grasses and sedges – into food for human consumption. Grasses were of two types, those from cultivated land and those from natural grasslands (Fridriksson 1972). In addition to grasslands, marshland flora of sedges and rushes were maintained and harvested as a hay source, possibly as a winter fodder (Ingvason 1969; Fridriksson 1972).

Statistical analyses of farm seed assemblages suggest that within a fairly restrictive environment for sucessful agropastoral practices, there is still room for Icelandic farmers to choose between subsistance practices. Three prominent trends in the livestock forage data appear: (1) regional varriation; (2) an impact from barley production; and (3) a change over time. Two types of datsets are used to analyze this varation– proportions of taxa in assemblages and densities of taxa in assemblages per liter floated. Proportions of taxa in assemblages allow for a direct comparison of the relative use and possibly preference of taxa by farms. For each farmstead all taxa (other than Cary/*Montia*) in midden deposits have been summed and proportions derived from those sums.

Seed densities are a way of standardizing paleoethnobotanical data when different sampling strategies occurred, generally from different sized flotation samples. By standardizing to the liter of flotation, densities allow for the comparison of taxa. This is generally use in paleoethnobotanical studies to study distribution of taxa within a site. A basic assumption in densities is that the larger the soil sample, the more plant remains will be present, all things being equal. However, paleoethnobotanists have recognized that all things are not equal, especially when comparing densities across different sites, citing the high variation in depositional, taphonomic, and preservation processes that impact seed presence and densities between sites. One way to negotiate this issue is to compare only samples from contexts that have similar preservation environments. This is applied in the current study by only examining contexts from midden deposits to help control for differences in preservation and depositional conditions across sites (Lee 2014).

Regional variation in forage resources

Langholt and Hegranes are neighboring landforms that vary in their geographical and vegetational distribution. Langholt rests along the western edge of the fjord, with most farms having fairly equal access to highlands, lowlands and marshlands. Hegranes, an island at the base of the fjord is surrounded by two glacial rivers. The island is much rockier, with abundant scree outcrops. The farms have more variation in access to vegetation coverage, with some farms with more grass lands, others with more marshlands, and many with more heathland, rocky outcrops.

As seen in the Barley distribution section (page 71), barley production was not affected by these landscape differences between the two regions. However, the production and consumption of forage resources – sedges and grasses – differs between Langholt and Hegranes, a trend apparent in both the proportions and densities of sedge and grasses.

In the Viking Age, grass and sedge values are significantly different between the landforms. When using an independent t-test to analyze summed farmstead data, the proportion of grass across farm assemblages in Langholt is significantly higher than Hegranes (Table 18).The average grass density in Langholt (M=6.15, SD=13.94) is also significantly higher than Hegranes (M=1.29, SD=4.07) conditions; t(278.443)=5.10, p=0.00) (Table 19). Conversely, the average proportion of sedge in farm assemblages at Hegranes is significantly higher than Langholt (Table 18). The density analysis also reflects this - Hegranes has a higher mean density of sedge (M=5.28, SD=8.73) than Langholt (M=4.85, SD=8.67) (Table 19). While not statistically significant, this difference is interesting to take note of (in fact the median of sedge is higher in Langholt, 1.5 to Hegranes 1.37). This suggests that sedge is much more abundant at Hegranes, while grass is more abundant at Langholt.

Table 18
Mean proportions of grass and sedge between region and by time. Each case is a farmstead where all the midden deposits have been summed and proportions derived from those sums. Independent t-tests report differences in mean grass and sedge proportions.

Viking Age		Hegranes	Langholt	t-value	df	P
Grass	M	0.11	0.33	3.42	12.96	0.004
	SD	0.1	0.21			
Sedge	M	0.56	0.37	-2.52	39	0.016
	SD	0.23	0.22			
Medieval Age						
Grass	M	0.18	0.27	0.98	26	0.335
	SD	0.23	0.25			
Sedge	M	0.47	0.32	-1.61	26	0.119
	SD	0.27	0.21			

Table 19
Mean densities of important taxa (barley, grass, sedge, and crowberry) in midden samples by time period and by region.

Time Period	Viking Age		Medieval Age	
Sample mean densities	Langholt (n=235)	Hegranes (n=207)	Langholt (n=156)	Hegranes (n=44)
Barley	0.09	0.07	0.01[a]	0.00
Grass	6.15	1.29	1.36	0.88
Sedge	4.85	5.28	3.27	1.91
Crowberry	1.16	1.19	0.42	0.34

Note: n= number of samples analyzed
[a] The Medieval barley identified are all from insecure contexts or have Viking Age radiocarbon dates.

These mean differences between the regions are easily seen in box and whisker plots. For SPSS 25, the box represents 50% of the cases (farm averages), or the interquartile range. The line within the box is the median value of all cases. The whiskers record the largest and smallest cases. If a case value is higher than 1.5 the interquartile range past the edge of the box, it is considered an outlier, and represented instead by an asterisk (*). The box plot in Figure 17 displays the distribution of average proportion of sedge and grass of the total assemblage at farms in Hegranes (blue) and Langholt (red) for the Viking Age.

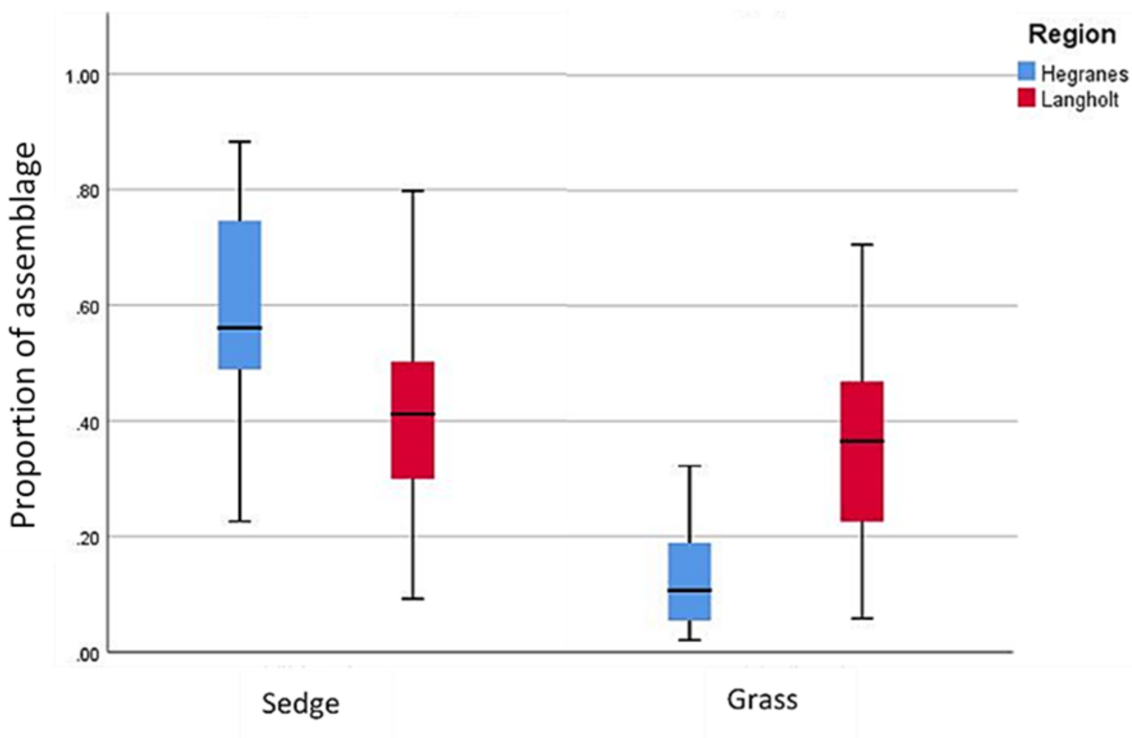


Figure 17. Box and whisker plot of average proportion of sedge and grass in seed assemblages by region.

The previous analysis of the farmstead sedge and grass proportion data violates some of the assumptions of an independent t-test. The assemblage proportion of grass and sedge are not entirely independent of each in the same time period and region (densities do not have this issue – they are independent of each other). As grass and sedge are the most dominant taxa, generally as one goes up the other goes down as a proportion of the total assemblage.

However, similar results are obtained using the less intuitive paired sample t-test with the summed farmstead data comparing grass and sedge proportions within each region (Table 20). All of paired samples are negatively correlated, indicating that these proportions are in fact dependent. Similar to the independent t-test, the assemblage proportion of grass and sedge in Viking Age Hegranes is significantly inversely correlated. This supports the argument that Hegranes farmers are compensating for a lack of grass resources with sedge forage. The results of the dependent grass and sedge t-test suggest that in Viking Age Hegranes, the substantially larger assemblage proportion of sedge (60%) to grass (12%) is highly significant ($p = 0.000$, Table 21). This larger proportion of sedge in Hegranes is also seen in the paired t-test during the medieval (47%), albeit to a lesser extent ($p = 0.054$, Table 21).

Table 20
Mean proportions of grass and sedge by region and by time. Each case is a farmstead where all the midden deposits have been summed and proportion derived from those sums. Correlation coefficient reports the strength of the relationship between grass and sedge by region within time periods.

Period	Region	Proportion of Assemblage				Correlation	Correlation Significance
			Mean	N	SD		
Viking	Hegranes	Grass	0.1231	24	0.091	-0.453	0.026
		Sedge	0.6	24	0.177		
	Langholt	Grass	0.354	11	0.193	-0.286	0.394
		Sedge	0.402	11	0.193		
Medieval	Hegranes	Grass	0.222	13	0.237	-0.447	0.126
		Sedge	0.473	13	0.261		
	Langholt	Grass	0.267	12	0.246	-0.053	0.871
		Sedge	0.32	12	0.209		

Table 21
Mean differences of grass and sedge proportions split by regions by time. Each case is a farmstead where all the midden deposits have been summed and proportions derived from those sums. Paired t-tests report differences and significance in farmstead grass and sedge proportions.

Period	Region	Paired Differences					t	df	Sig. (2-tailed)
		Mean	SD	SE	95% Confidence Interval of the Difference				
					Lower	Upper			
Viking	Hegranes	-0.477	0.233	0.048	-0.576	-0.379	-10.031	23	0.000
	Langholt	-0.048	0.310	0.093	-0.256	0.161	-0.509	10	0.622
Medieval	Hegranes	-0.251	0.424	0.118	-0.507	0.005	-2.133	12	0.054
	Langholt	-0.052	0.331	0.095	-0.262	0.158	-0.540	11	0.600

While both regions are utilizing grass and sedge for foddering and grazing of livestock, these analyses of the proportions and densities suggest that farmers in each region are focusing on one or the other. The fact that grass is the preferred forage source would indicate that Langholt seems to have better access to grasslands for their livestock – either for grazing, or more likely for foddering (Fridriksson 1972). It is hard to imagine farmers moving dung from far distances back to the home, so foddered animals and grazing closer to the home are the more likely source of the dung, and thus the seeds. This difference may reflect the more abundant access to grasslands that each farm in Langholt seems to have today, in comparison to the much more varied access on Hegranes.

Hegranes farms do have grass in their assemblages, and some at high proportions, but sedge is more abundant. The overwhelming proportion of sedge indicates a heavy usage of wetland and marshland resources for livestock forage. The lack of highland access for grazing may have forced farmers on Hegranes to compensate by sending their livestock down to the surrounding marshlands in addition to an increase use of marshlands, bogs and wetlands for harvesting wetland fodder.

Impacts of barley on foraging

When the data is broken down to the farm level and barley production is analyzed, these differences become even more pronounced and show how the farmers in the different regions were able (and not able) to exercise choice in subsistence strategies.

Langholt shows much more variation in livestock foraging choices and subsistence practices both with and without barley. Figure 18 shows a scatterplot with fit lines for Viking Age sites on Langholt with and without barley and the proportion of sedge and grass present in the seed assemblages. For farms without barley, there is no correlation between sedge and grass proportions – one is not being used at the expense of the other (which would normally be expected when looking at proportions in an assemblage with two dominating taxa).

When barley is present at Langholt farms, we see a strong correlation with an R^2 of 0.716 between the proportion of grass to sedge. However, this fit line is fairly shallow, indicating that while there is a wide range for grass proportions, there is a much narrower variation in sedge. The narrowness of the range in sedge makes this strong correlation between grass and sedge not significant, $r = -0.148$, $n = 7$, $p = 0.751$. These data indicate that Langholt farmers had a wide range of livestock forage choices, especially when barley was produced.

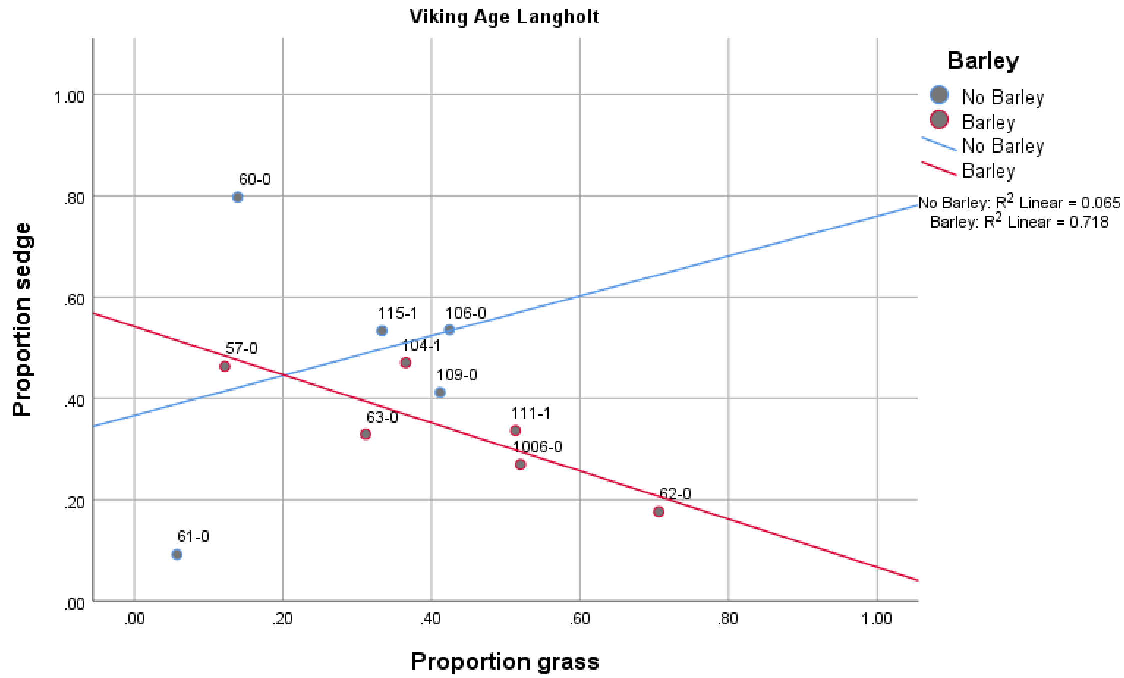


Figure 18. Scatter plot of proportion of seed assemblage per farm of sedge and grass for Viking Age Langholt farms. The data are split between farms with barley present (red) and those without (blue). The No Barley fit line has a weak R^2 of 0.065, and the Barley fit line has a strong R^2 of 0.716. (Graph by author, 2019)

However, Hegranes farms did not experience the same freedom of choice as Langholt. Individual Hegranes farms (both with and without barley present) overwhelmingly used sedge forage sources. This can be seen in Figure 19, a scatter plot with the proportions of sedge by grass organized by farms with barley (red) and those without (blue). The farms all cluster in the left side of the scatter plot, where there are lower proportions of grass and much higher proportions of sedge. There is no inherent relationship between sedge and grass when barley is not present (R^2 of 0.076), but the production of barley forces the farmers to choose between sedge and grass production. The farms with barley present have a moderately strong correlation of R^2 of 0.388, and the steepness of the line indicates that when there are minor changes in grass, there are huge changes in sedge proportions. Strikingly different than Langholt, the grass and sedge proportions on Hegranes are directly inversely related. This inverse correlation is significant, r = -0.547, n = 15, p = 0.043, and shows that farms producing barley on Hegranes were growing barley at the expense of grass, and sedge was used to compensate when the prime forage source (grass) could not be utilized.

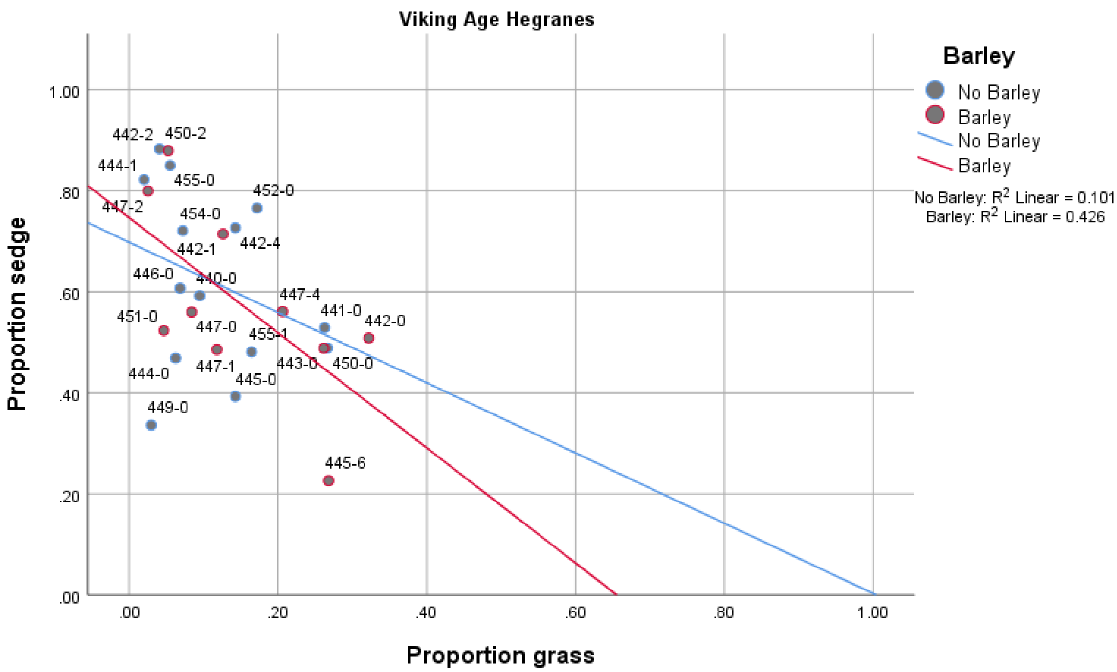


Figure 19. Scatter plot of proportion of seed assemblage per farm of sedge and grass for Viking Age Hegranes farms. The data are split between farms with barley present (red) and those without (blue). The No Barley fit line has a weak R^2 of 0.076, and the Barley fit line has a moderately strong R^2 of 0.388. (Graph by author, 2019)

Hegranes farmers do not seem to have the freedom of choice in forage resources that Langholt farmers experienced, especially when they chose to engage in barley production. This is further emphasized when the data are presented in histograms, where range in proportions of each foraging type can be viewed by the number of farms.

Histograms of the grass proportions for Langholt and Hegranes farms with barley present show opposing trends. At Langholt when barley is present, there is a normal curve of the proportion of grass in the assemblage by the number of farms; the lowest value of grass is 10% and the highest is 80%, Figure 20. However, Hegranes has a skewed curve, favoring many farms with very low proportions of grass, the lowest is 0% and the highest is 40%. Five farms have between 0 and 10% grass in their assemblages.

When sedge presence is analyzed in histograms, the compensation for this lack of grass by Hegranes farmers is even more vivid. Figure 21 displays the proportions of sedge by the number of farms per region when barley is present. For Hegranes, the histogram has a moderately normal curve, with a skew towards higher proportions of sedge. Most farms, n=6, contain between 50% and 60% sedge. Langholt has a tight, skewed curve towards higher proportions of sedge, but unlike Hegranes, the highest proportions are less than 50% of the assemblage.

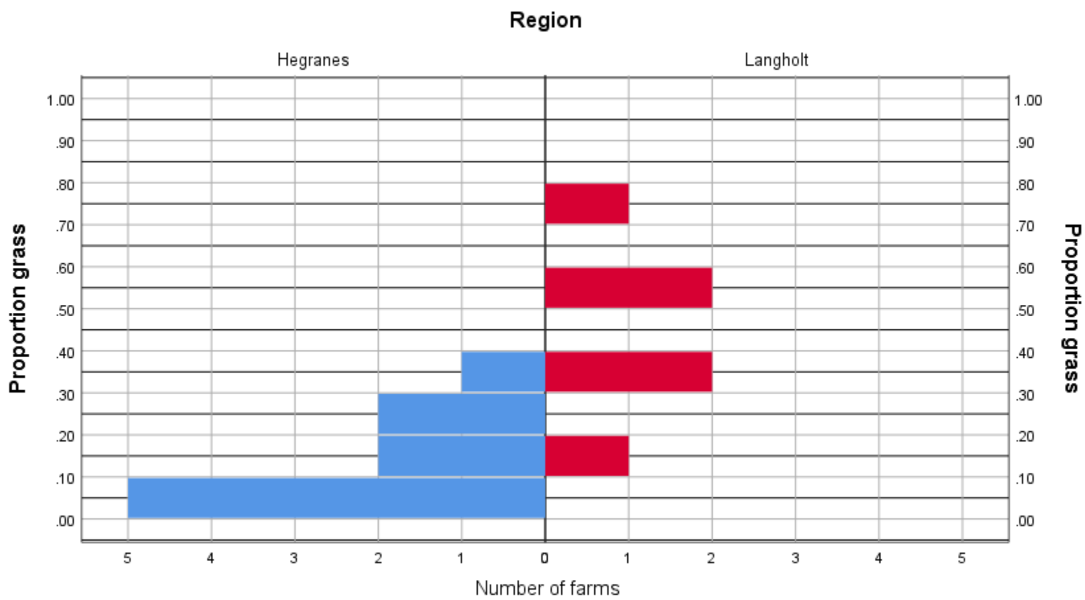


Figure 20. Dual histogram of the proportion of grass in assemblages at farms with barley by region: Hegranes (blue) and Langholt (red). (Graph by author, 2019)

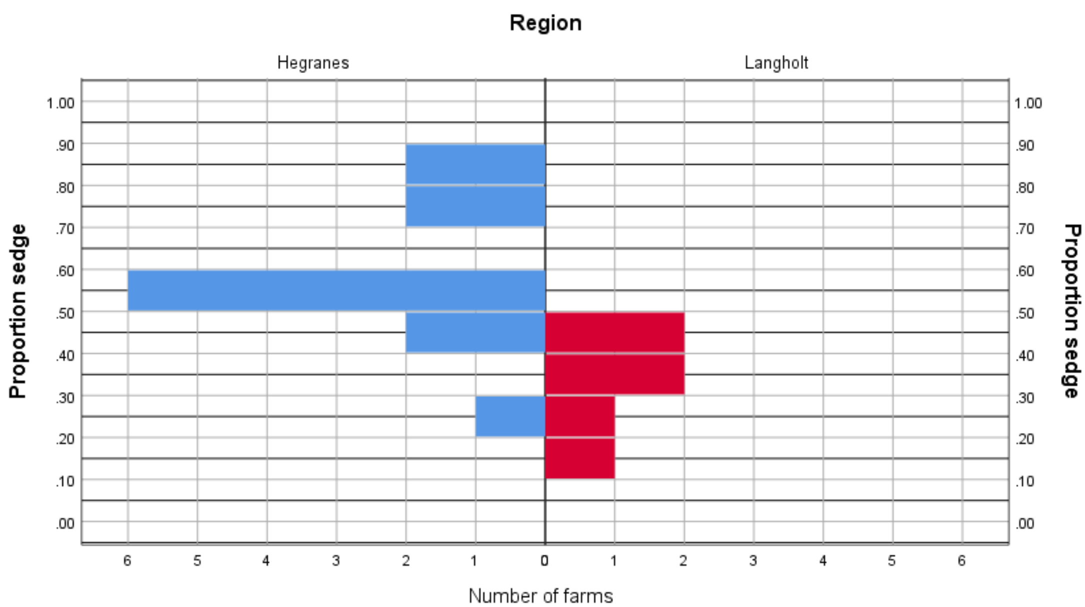


Figure 21. Dual histogram of the proportion of sedge in assemblages at farms with barley by region: Hegranes (blue) and Langholt (red). (Graph by author, 2019)

Without barley present, Langholt farms were producing less grass fodder, with slightly more sedge, than farms with barley present. The histogram of Langholt farms is skewed towards higher proportions of grass, although the highest proportion range (40%-45%) is lower than more than half of the barley producing farms (Figure 22). Sedge proportions are normally distributed between 0-10% and 70-80% (Figure 23). This may indicate that Langholt farms with barley present were in general also more productive in grass production. When barley is not being produced, sedge utilization increased with a slight decrease in grass production.

However, at Hegranes farms without barley, grass production was even more severely limited and sedge more emphasized than farms with barley. The histogram is once again heavily skewed towards low proportions of grass, with eight farms having less than 10% grass (Figure 22). These farms were compesating even more for this lack of grass by utilizing more sedge than those farms with barley. Nine farms have over 50% sedge in their assemblages (Figure 23).

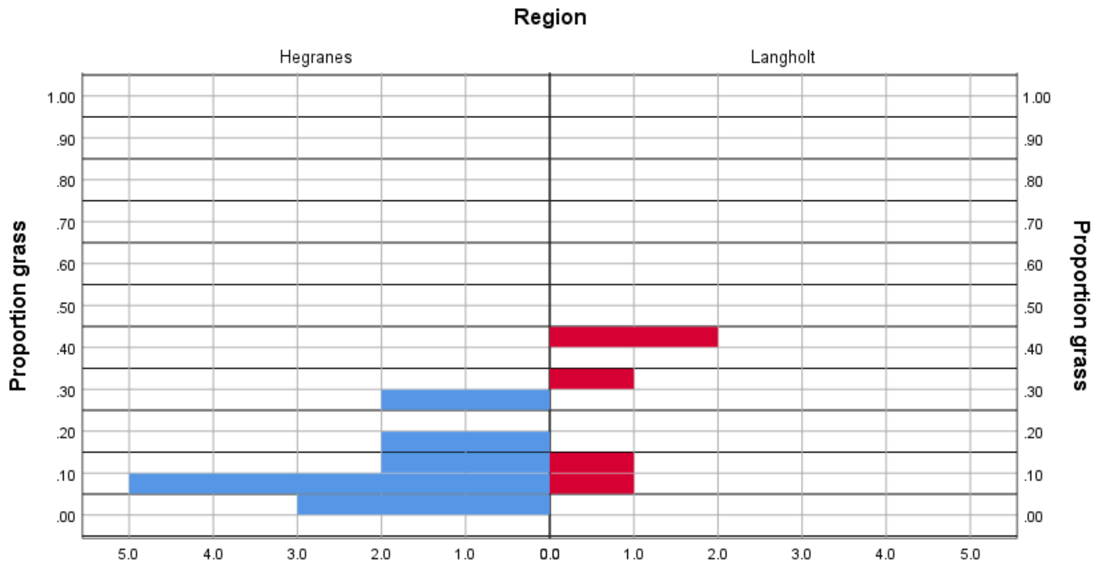


Figure 22. Dual histogram of the proportion of grass in assemblages at farms without barley by region: Hegranes (blue) and Langholt (red). (Graph by author, 2019)

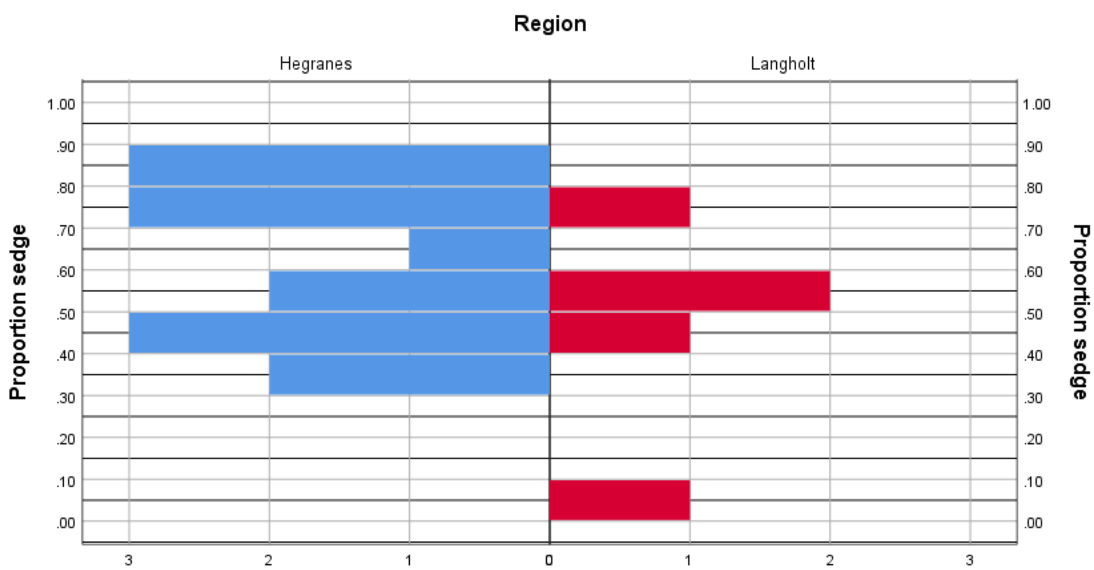


Figure 23. Dual histogram of the proportion of sedge in assemblages at farms without barley by region: Hegranes (blue) and Langholt (red). (Graph by author, 2019)

Barley production is not limited by the regional differences, as seen in the discussion on barley ubiquity. However, the primary livestock foraging practices seem to be affected by this choice to grow barley at Hegranes, but not at Langholt, indicating that choice in forage is very much dependent on the the local environment. Langholt, with its more equitable access to various vegetational coverage, enabled its farmers to have greater choice in grass and sedge production. At Hegranes, however, farmers had to compensate for a lack in grass avaliability by increasing their use of sedge resources. The land suitable for grass in Hegranes is the same as that for barley, and is limited when barley farmers grow barley, further increasing their use of sedge. This shows the farmers versatility in production strategies and their adpatation to their local environments

Forage change over time

The Viking Age has sometimes been viewed as the "Golden Viking Age" where farmers were able to live relatively comfortably with high farm productivity and fairly equal land rights (Zori 2016). The onset of the Medieval Age, with its colder climate and increase in social inequality had the potential to reduce agropastoral productivity. The foraging taxa densities between the regions over time lends a potential light into a change of livestock foraging deposition over time.

Zutter (1992) finds in the archaeobotanical assemblages from the Svalbarð midden deposits in Northeastern Iceland that "macrofloral remains decrease substantially in quantity and variety" after 1400 AD. She notes some possible explanations for this decline, including declining productivity resulting from the onset of the Little Ice Age and/or decreasing soil nutrients in fields which may require an increase in the usage of manure as fertilizers, resulting in less deposition in the middens.

While the proportions analysis did not find a significant difference in the proportions of grass and sedge in the Medieval Age in either Hegranes or Langholt, the forage density data reflect the decline noticed by Zutter. If this interpretation is correct for Skagafjörður the data pushes the onset of this decline earlier to 1104 AD. Although there is an overall reduction in mean grass over time to the Medieval Age, Langholt (M=1.36, SD=3.48) and Hegranes (M=0.88, SD=2.59), the difference between grass densities in Medieval midden samples is not significantly different. The reduction in mean grass from the Viking Age to the Medieval Age is significant only for Langholt, Viking (M=6.15, SD=13.94) and Medieval (M=1.36, SD=3.47) conditions; t(276.243)=5.036, p=0.000). At Hegranes, there is a significant decrease in mean sedge densities of Viking Age samples (M=5.28, SD=8.73) and Medieval Age samples (M=1.91. SD=2.64) conditions; t(223.348)=4.64, p=.000). For both regions, there is a significant reduction of crowberry densities over time – Langholt t(305.189)=3.207. p=.0001 and Hegranes t(231.591)=4.726, p=0.000. There is no significant difference in mean densities of any taxa between Langholt and Hegranes in the Medieval Age, although Langholt has marginally higher means for all taxa (Table 19)

These differences in average densities are displayed in box and whisker plots. Figure 24 shows the average density of grass of the total assemblage at farms difference in Hegranes (blue) and Langholt (red) for the Viking and Medieval Ages . The difference in means between the two regions is significant, with Langholt having significantly more grass than

Hegranes. This difference, while still present in the Medieval Age, is not significant, and for both regions, the grass densities reduce and even out. Figure 25 displays the distribution of average density of sedge of the total assemblage at farms in Hegranes (blue) and Langholt (red) for the Viking and Medieval Ages. Hegranes has significantly higher sedge density in its farms' assemblages than Langholt. Once again, this difference is not significant in the Medieval.

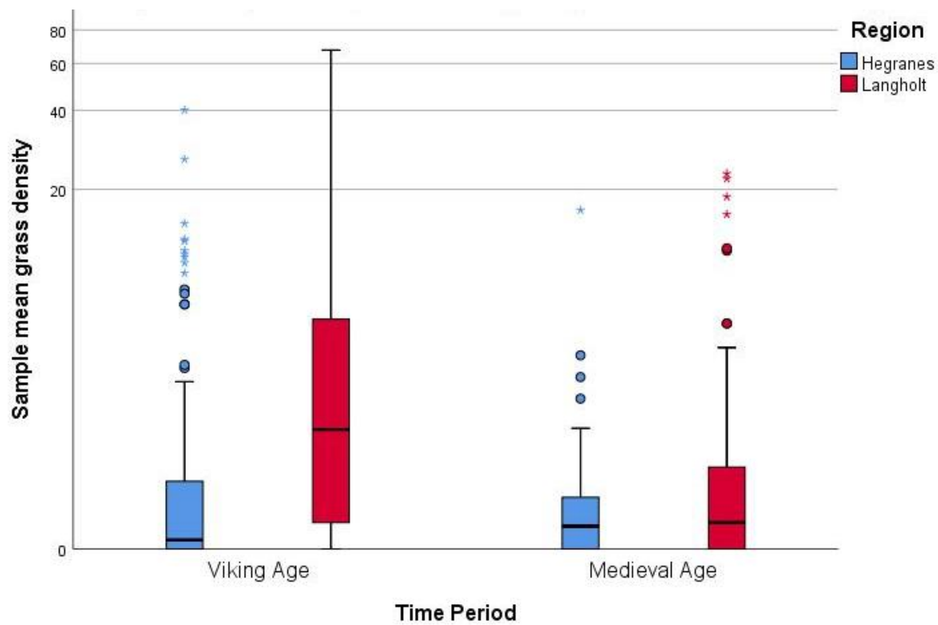


Figure 24. Box and whisker plot displaying the mean grass densities of all midden samples from Hegranes (blue) and Langholt (red) over time. The chart uses a logarithmic scale. (Graph by author, 2019)

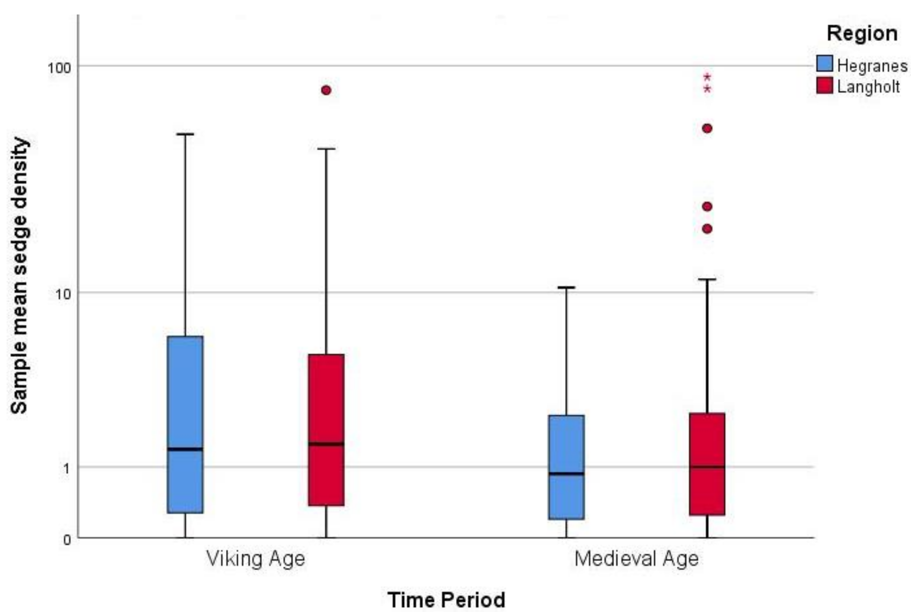


Figure 25. Box and whisker plot displaying the mean sedge densities of all midden samples from Hegranes (blue) and Langholt (red) over time. The chart uses a logarithmic scale. (Graph by author, 2019)

These analyses may point to an overall reduction in productivity beginning approximately in 1104 AD, correlating with the end of the “Golden Viking Age”. The reduction in crowberry densities, and the increase in uncharred seeds into the Medieval Age may indicate a change in wild resources usage in the Medieval Age or a change in depositional practices. An increase in alternative fuel use other than animal dung, such as turf, an increase in manuring of fields, or a shift to increase sheep husbandry with less dung close by for fuel use are other possible explanations for the overall decrease in densities of seeds in the Medieval assemblages.

The proportions and densities of prime forage taxa analyses demonstrate that there was variation in production between regions, when barley is present, and over time, During the Viking Age in general, Langholt was significantly more productive when using proportions and densities of barley, grass, and sedge as a proxy for farm production. The data suggests that Hegranes farmers may have attempted to compensate for a lack of grass at their farms by substituting it with sedge. Over time, between the Viking to Medieval age, both regions experience a decrease in seed deposition. For Langholt, this is significant in grass and crowberry. In Hegranes, although grass does decrease, it does not do so significantly. However, sedge does decrease significantly over time in addition to crowberry. When comparing Medieval samples between regions, there are no significant differences, even though Langholt has marginally higher densities. This shows that during the Viking Age, there was significant variation in production strategies between the two regions. However, by the Medieval Age, both places reduce significantly in their seed deposition (grass at

Langholt, and sedge at Hegranes). The overall variation in production between regions has levelled-out, with farms in both regions depositing at similar levels, but much less so than in the Viking Age.

Statistical check for across site density comparisons

Due to the problematic nature of comparing densities across sites, an additional check on the use of these densities was conducted through a ratio of ratios analysis. Recognizing the issues with density comparison across sites, Lee (2012; 2014) developed a mathematical analysis to compare these densities. Building off of Orton's (2000:40–66) work on ceramic sherd density samples and its representation of a population – interassemblage ratios – Lee applies this to archaeobotanical assemblages, specifically using the densities ratio of ratios of specific taxa. Across features (or in this case sites), the ratio of ratios between taxa remains constant through time, reflecting the original, target population (the seed population at the time of deposition). This analysis allows for a direct comparison between two taxa across sites and "prevents the uncertainty of whether quantitative differences of plant remains between two periods [or regions] results merely from different sample sizes rather than from real changes in cultural practices through time" (Lee 2014:9).

Table 22 provides the data on mean densities from midden samples across farms in the two regions and over time. The percentages of these mean densities are also provided. The interassemblage ratio of ratio of grass and sedge densities (as the main forage taxa) was conducted and further supports the previous density discussion. The relative R, described by Lee (2012), is almost universally below or around 0.20, or 20%, the allowed standard error threshold (with the exception of barley in the Medieval – data that should be excluded due to the insecure nature of the contexts – and interestingly Medieval grass in Hegranes). This indicates that our samples are good representations of the original deposited botanical remains, and the densities can be compared across sites and differences interpreted as differences in cultural practices, not preservation variation.

The relative ratios of grass : sedge from the Viking to Medieval Ages reflects the results from the percentages analysis. The change in the ratio of grass : sedge through time is much more drastic in Langholt (3.05) than Hegranes (0.53). Furthermore, the difference between the regions during the Viking Age (5.17) is much more drastic than in the Medieval Age (0.90), mirroring the levelling-out seen in the previous discussion of Forage change over time.

The overall consistency of the results from the proportions and densities analyses shows the strength of this data set in reflecting variation in cultural practices at farms between the regions and across time. In summary, barley is ubiquitous across farms of varying wealth and status and across the regions. Conversely, the data indicate a wide variation in grass utilization and/or production across the two regions and over time.

Langholt farms utilized and deposited more grass than Hegranes farms during the Viking Age, and both farms deposited more grass in the Viking than in the Medieval (although this is only a significant difference for Langholt). This variation in grass is further emphasized when barley is present in assemblages: Langholt farmers retained their choice in prime livestock forage, while Hegranes farmers seem to be limited to sedge production.

Table 22
Interassemblage ratio of ratios with mean densities and percentage of densities for barley, grass, sedge, and crowberry, between regions and time periods. Interassemblage ratios include the ratio of grass to sedge densities per time period, per region; ratio of Viking to Medieval grass to sedge ratio per region; and the Langholt to Hegranes grass to sedge ratios by time period.

Region	Period	Taxa	% Density	Mean Density	STD Error	Relative R	Ratio Grass : Sedge
Hegranes	Viking	Barley	1%	0.07	0.02	0.25	0.25
		Grass	13%	1.29	0.28	0.22	
		Sedge	55%	5.28	0.61	0.12	
		Crowberry	12%	1.19	0.15	0.13	
		Percentage of total seed density	*81%*	*9.65*	*1.02*	*0.11*	
	Medieval	Barley	0%	0.00	0.00	1.00	0.46
		Grass	17%	0.88	0.39	0.44	
		Sedge	36%	1.91	0.40	0.21	
		Crowberry	6%	0.34	0.09	0.28	
		Percentage of total seed density	*60%*	*5.27*	*1.16*	*0.22*	
Langholt	Viking	Barley	1%	0.09	0.02	0.25	1.27
		Grass	40%	6.15	0.91	0.15	
		Sedge	32%	4.85	0.57	0.12	
		Crowberry	8%	1.16	0.21	0.18	
		Percentage of total seed density	*80%*	*15.34*	*1.81*	*0.12*	
	Medieval	Barley	0%	0.01	0.01	1.00	0.42
		Grass	10%	1.36	0.28	0.20	
		Sedge	24%	3.27	0.85	0.26	
		Crowberry	3%	0.42	0.09	0.20	
		Percentage of total seed density	*37%*	*13.58*	*1.93*	*0.14*	

Ratio of Ratios Viking to Medieval Age (VA grass:sedge : MA grass:sedge)	Ratio of Ratios Viking and Medieval, Langholt to Hegranes (Langholt grass:sedge : Hegranes grass:sedge)
Hegranes grass:sedge (VA : MA)	Viking Age (Langholt : Hegranes)
0.53	5.17
Langholt grass:sedge (VA : MA)	Medieval Age (Langholt : Hegranes)
3.05	0.90

Case Studies

The broad trends found in the previous discussions are supported by a high variation at the farm level. This shows the importance of a regional analysis to understand variation in production strategies – because only at the regional level could you see the broader livestock foraging trends between the two regions. When individual farms are examined, the data is highly variable between samples and contexts. Two sites from Hegranes (that were excavated in part by the author) displays the great variation within the Hegranes landform. The two sites are Vatnskot 443-0 and Grænagerði 447-1 (Figure 26).

Both farms follow the trends found in the regional analysis for Hegranes: higher sedge and lower grass densities/proportions. Both farms also have barley and oats present. However, these trends are highly variable within the contexts at the individual sites. At both sites, contexts were able to be dated to the Early and Late Viking Ages through the use of the 1000 AD tephra layer. Contexts below the 1000 layer are considered from the Early Viking Age and contexts above the 1000 layer and below the 1104 AD tephra are considered Late Viking Age. This more defined chronological control allows for a deeper examination of variation within the Viking Age over time.

The following section covers an examination of the high level of variation at these two sites on Hegranes, including different taxa densities over time, and the added potential cultivation of oats at Grænagerði. The case studies include taxa from all context types, not just middens as the previous discussions were limited to.

Figure 26. Air photo with locations of case study farms - Grænagerði and Vatnskot - superimposed. (Map by author, 2019)

Grænagerði 447-1

Grænagerði, located in the west of the Hegranes region, is one of four abandoned sites located within the neighboring, larger, farm Helluland's 447-0 boundaries, Figure 27 (a). This farm was analyzed as part of Kathryn Catlin's dissertation research on small, often abounded, domestic sites The SCASS in Skagafjörður (Catlin 2019). The SCASS team classifies the site as a sub farm of Helluland. Grænagerði has an establishment date of approximately 1145 ± 15 BP (cal. AD 856–971 (2σ) UCI-201414) – placing the establishment during the *landnám* period. The site was abandoned sometime after 1000 AD and later used to home livestock (Catlin et al. 2017). The site is considered a small farm for the Hegranes region, with a Viking Age farm mound of 465 m^2. Initial coring and excavation occurred in the 2017 field season, the results of which are discussed by Catlin et al.

(2017:68–74), with follow up excavations for targeted faunal and macrobotanical recovery conducted during the 2018 field season, report forthcoming.

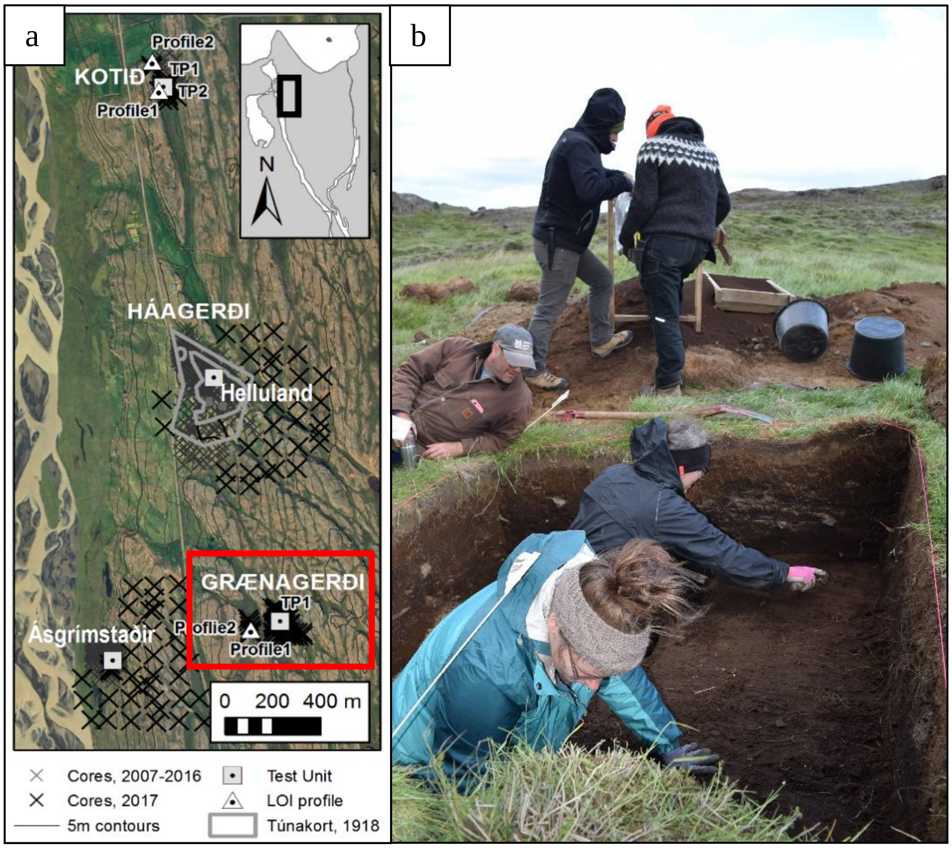


Figure 27. (a) Air photo with location of Helluland and the four abandoned farms within its historic boundaries superimposed. One of these farms is Grænagerði, located in the southeast. Map modified from Catlin et al. (2017:60). (b) Photo of excavations at Grænagerði during the 2018 field season (Photo by author, 2019).

Macrobotanical data recovered from Grænagerði shows a wide variety in taxa density within the Viking Age (Table 23).The overall mean density for the entire Viking Age is 4.17 seeds per liter, the mean density during the Early Viking Age (EVA) is 1.81 seeds per liter, while the mean density during the Late Viking Age (LVA) is 4.30 seeds per liter. The diversity of taxa also increases in the LVA. Cyperaceae (sedge), *Empetrum* (crowberries) and Poaceae wild (grasses) make up the bulk of the assemblage in both time periods.

Interestingly, 21 barley grains, with a density of 0.11 grains per liter, were recovered from the LVA contexts, while only 1 grain, density 0.01 grains per liter, was recovered from the EVA contexts. This seems to indicate an increase in barley deposition and/or production past the 1000 AD mark. Additionally, there was a higher number and density of oat grains the EVA.

Table 23

Mean densities of taxa recovered from all Viking Age contexts from Grænagerði. The three main taxa are bolded, oats and barley (labelled as Poaceae cf. Avena and Poaceae Hordeum) are bolded and red. The mean densities for the Late and Early Viking Ages, and the total Viking Age densities are bolded.

Context	Period	Volume Floated (l)	**Cyperaceae**	***Empetrum***	**Poaceae Wild**	**cf. *Avena***	***Hordeum***	Cereal	*Leontoden*	*Rubus*	Juncaceae	*Galium*	*Arctostaphylos*	*Menyanthes*	*Ranunculus*	Violaceae	*Capsella*	*Vaccinium*	Fabaceae	*Lupinus*	*Trifolium*	*Rhinanthus*	Polygonaceae	Rosaceae	Total
102/105	Late Viking	7.50		2			2		1													1			6
103/106	Late Viking	112.00	281	236	44	16	19	8	1	5	3		3		1				1	1				1	620
103/107	Late Viking	56.50	55	44	1	18		1	2			2		1	2	1		1			1		1		130
Mean Late Viking density		**176.00**	**1.91**	**1.59**	**0.26**	**0.19**	**0.11**	**0.05**	**0.02**	**0.03**	**0.02**	**0.01**	**0.02**	**0.01**	**0.02**	**0.01**	**0.00**	**0.01**	**0.01**	**0.01**	**0.01**	**0.00**	**0.01**	**0.01**	**4.30**
104/108	Early Viking	139.00	134	53	24	1	1		3		1	2		1		1	1								222
110	Early Viking	6.00	11	4	24									1											40
Mean Early Viking density		**145.00**	**1.00**	**0.39**	**0.33**	**0.01**	**0.01**	**0.00**	**0.02**	**0.00**	**0.01**	**0.01**	**0.00**	**0.01**	**0.00**	**0.01**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**1.81**
Total		321.00	481	339	93	35	22	9	7	5	4	4	3	3	3	2	1	1	1	1	1	1	1	1	1339
Density		**321.00**	**1.50**	**1.06**	**0.29**	**0.11**	**0.07**	**0.03**	**0.02**	**0.02**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**4.17**

Vatnskot 443-0

Vatnskot is located in the east of the Hegranes region. The farm was excavated as part of the SCASS 2017 and 2018 field season (Figure 28). The 2018 excavations were conducted similarly to Grænagerði, for the targeted recovery of faunal and macrobotanical remains. The establishment date of Vatnskot was determined to be 1125 ± 15 BP (cal AD 889–971 (2σ) UCI-212543) – placing the establishment of this farm during the *landnám* period. Vatnskot is a successful farm as it is still occupied today and is considered a moderately large farm for the Hegranes region with a Viking Age farm mound of 3539 m^2. For full details of the 2017 excavations see Bolender et al. (2018:20–25), 2018 field season report forthcoming.

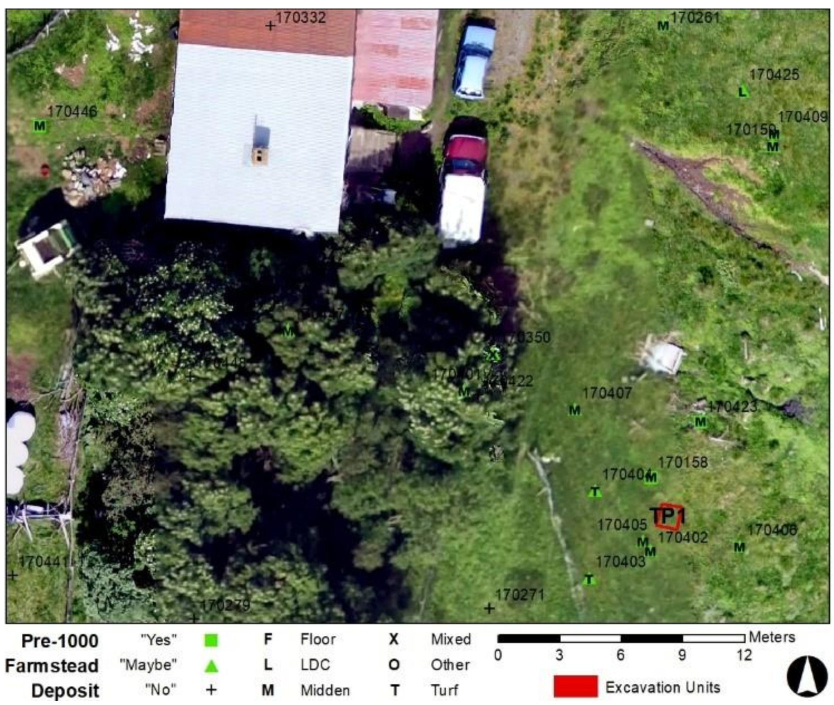


Figure 28. Air photo of location of 2017 excavation at Vatnskot, with survey cores superimposed. The 2018 excavation expanded adjacent to the west of the 2017 unit (Bolender et al. 2018).

Macrobotanical data recovered from Vatnskot shows a high variety of taxa distributions across time, but different to that of Grænagerði. The overall mean density of taxa recovered is 24.99 seeds per liter, nearly five times the density of Grænagerði. Interestingly, Vatnskot has a higher density of seeds in the EVA (34.37 seeds per liter) than the LVA (19.56 seeds per liter), opposite to the trend at Grænagerði. However, like Grænagerði, both barley and oats have higher densities in the LVA (barley – 38 grains, 0.17 grains per liter, and oats – 3 grains, 0.01 grains per liter). Vatnskot also has a higher diversity in the LVA, and the farm's three top taxa are Cyperaceae, Poaceae wild, and *Empetrum* (similar to Grænagerði), but with more Poaceae than *Empetrum* unlike Grænagerði. See Table 24 for seed counts and densities recovered from all Viking Age context types from Vatnskot.

For both Grænagerði and Vatnskot, there is a wide variety in the distribution of taxa across contexts and time periods. If only a singular site or few sites were analyzed, the broader trends that emerge within a regional analysis would not be available. Both the regional analysis and specific case studies illustrate that there is a wide variety of production strategies and seed deposition across farms of varying sizes and through time, challenging the notion of a uniform Icelandic agropastoral subsistence strategy.

Table 24
Mean densities of taxa recovered from all Viking Age contexts from Vatnskot. The three main taxa are bolded, oats and barley (labelled as Poaceae cf. Avena and Poaceae Hordeum) are bolded and red. The mean densities for the Late and Early Viking Ages, and the total Viking Age densities are bolded.

Context	Period	Volume Floated (l)	**Cyperaceae**	**Poaceae Wild**	***Empetrum***	*Capsella*	***Hordeum***	Juncaceae	Polygonaceae	Rosaceae	Viola	*Arctostaphylos*	*Polygonum*	*Ranunculus*	*Vaccinium*	*Portulaca*	Violaceae	*Menyanthes*	**cf. *Avena***	Asteraceae	*Myosotis*	cereal	*Lolium*	*Rumex*	*Potamogeton*	Total
103/111/117	Late Viking	52.50	50	14	20																					84
104/112/119/120	Late Viking	54.00	510	173	383	4	25	6	1	4					1			1	2	2			1			1113
121	Late Viking	82.00	1410	899	351	3	7	2		5	7	6	5	3	1	3	3		1			2		1		2709
122	Late Viking	31.00	156	62	160	3	6						1													388
Mean Late Viking density		**219.50**	**9.69**	**5.23**	**4.16**	**0.05**	**0.17**	**0.04**	**0.00**	**0.04**	**0.03**	**0.03**	**0.03**	**0.01**	**0.01**	**0.01**	**0.01**	**0.00**	**0.01**	**0.01**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**19.56**
105/106/113/123	Early Viking	37.00	302	138	39	249	8				1				2		1									740
105/113/123	Early Viking	9.00	210	115	48				1																	374
106/113/123	Early Viking	8.00	20	18	4																					42
107/114/124	Early Viking	30.50	1584	1274	129	27	1	5	7			1		3	1	2	1	3			2				1	3041
108/115/125	Early Viking	31.50	31	3	10																					44
109	Early Viking	6.00																								0
Mean Early Viking density		**122.00**	**17.60**	**12.69**	**1.89**	**2.26**	**0.07**	**0.04**	**0.07**	**0.00**	**0.01**	**0.01**	**0.00**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.00**	**0.00**	**0.02**	**0.00**	**0.00**	**0.00**	**0.01**	**34.76**
Total		341.50	4273	2696	1144	286	47	13	9	9	8	7	6	6	5	5	5	4	3	2	2	2	1	1	1	8535
Density		**341.50**	**12.51**	**7.89**	**3.35**	**0.84**	**0.14**	**0.04**	**0.03**	**0.03**	**0.02**	**0.02**	**0.02**	**0.02**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.00**	**0.00**	**0.00**	**24.99**

CHAPTER 7

CONCLUSION

The analyzed data presented in this thesis is used to describe the critical role the broad trends and substantial variation in cereal production and livestock foraging strategies likely played in the Norse settlement and continued use of the island. At the broad level, the distribution of the 41 taxa identified suggest a similar diversity and evenness across farms of varying sizes, statuses, and regions. Barley presence followed similar pattern of regularity. Based on seeds, present in fuel residue, farms seem to be utilizing the same flora no matter their size, assumed status, or regional location. However, the proportions of these resources, especially the top three taxa groups – grasses, sedges, and heath – vary at the regional level and through time. Furthermore, when individual farmsteads, and contexts within those farm mounds, are examined (e.g., the case studies presented) there is a large variation in densities and proportions of different taxa, across samples from the same context, between different contexts, and through time.

The broad trend of barley regularity point to a common productive strategy during the Viking Age. The relatively consistent diversity and evenness measures of the major taxa across sites, time, and region testifies to the resilience of the Icelandic farmer in the face of a marginal, restrictive, and changing local environment. Furthermore, the regional and temporal variation in the use of specific taxa critical to livestock foraging (grass and sedge) and the variation across samples at the case study sites, suggests that while farmers were limited to similar, broad agropastoral schema, their adaptive capability to tailor their productive strategies to local environments was impressive.

Much Icelandic archaeological and historical research has focused on understanding the layout of the farmstead structure, large paleoecological changes caused by settlement of the island, infield-outfield systems, and feasting practices within the social-political economy (Zutter 1992; Smith 1995; Zutter 1997; Zutter 2000b; Simpson et al. 2002; Adderley and Simpson 2005; McGovern et al. 2007; Zori et al. 2013; Zori 2016; Riddell et al. 2017). However, regional analyses of settlement, such as Smith (1995), McGovern et al. (2007) Sveinbjarnardóttir et al. (2008), Steinberg et al. (2016) and Bolender (2018), are relatively few. As Smith (1995:331) states "too few early sites have been adequately studied to describe regional variations in the rate at which settlements spread across Iceland". In addition to understanding the rate and process of settlement, a regional study, exemplified in this thesis, provides the opportunity to unravel the broad trends in livestock forage production and flora utilization that are a central aspect of historic Icelandic economic ventures (Fridriksson 1972; Amorosi et al. 1996).

At the farmstead level, the case studies of Vatnskot and Grænagerði showed the variation in taxa densities and proportions within a small window of time, the Viking Age (870-1104 AD). The data presented by the case studies and the aggregated regional analysis further support Smith's (1995:331) statement emphasizing the early Viking settlement phase of experimentation and adaptation to a new climate and landscape. The prospect of oat cultivation, and a potential flora signature of cereal intensification at Grænagerði is further evidence of the versatility of Icelandic farmers and their continued experimentation and adaption into the Lake Viking Age.

With the aggregation of farmstead level data into regional and chronological divisions, broad trends in agropastoral production strategies emerge. The systematic macrobotanical data provided in this thesis and the broad trends recovered from them are the first of its kind to be presented in Icelandic archaeology. This research compliments other regional studies that focus on palynology and provide excellent resources on the paleoecological changes caused by the Icelandic farmers (Buckland et al. 1995; Zutter 1997; Erlendsson et al. 2009; Vickers et al. 2011). Macrobotanical analyses focus on singular farmsteads, or groups of farms, recovered from house deposits (floors, charcoal layers, pits, hearths, etc.) (Zutter 1992; Guðmundsson 2009; Guðmundsson and Hillman 2012; Zori et al. 2013; Bold 2012; Mooney 2017; Riddell et al. 2017). The SCASS assemblages, however, have systematically recovered macrobotanical data from farmstead middens, providing direct analyses of the animal husbandry practices of farmsteads of varying size, location, and sustainability.

These analyses have revealed two major trends in farm production strategies: the broad ubiquity of barley and the substantial variation in livestock forage utilization. Barley appears at slightly more than half (54%) of the 42 farms surveyed (n=2 22) including the two farms where barley was recovered from contexts other than middens. The farms where barley was recovered represented a range of sites, including a fairly equal distribution across the two farm size categories – small and large – and across the two regions – Langholt and Hegranes. Using Viking Age farmstead mound size as a proxy for historical wealth and productivity, the analyses showed that there is not a statistically significant correlation of barley with large farms. Barley does not appear to be differentially present at wealthy, high status farms in the survey area. This complicates the interpretation of barley as a proxy for wealth and status when found on Icelandic farm sites , and the association of barley with farms of high status (Sveinbjarnardóttir et al. 2007; Zori et al. 2013; Riddell et al. 2017). Under this argument, over half the farms in the Skagafjörður region would be considered high status, from the presence of barley, including farms such as Grænagerði, whose Viking Age mound was only 465m^2. Conversely, substantially large and historically high-status farms that did not have barley recovered would be considered of low status.

The sociopolitical relations between farms of differing sizes is not fully understood (see Catlin 2019 for an in-depth discussion), and so the control over barley production and consumption is unclear. Barley, therefore can still be argued to be a prestige good reserved for beer production (Zori et al. 2013:154), but the distribution of barley production and consumption is much more common than previous archaeological studies have suggested. Additionally, this distribution of barley indicates that cereal production was much less restricted than has been previously imagined (Zori et al. 2013; Guðmundsson et al. 2013; Riddell et al. 2017). More importantly, barley presence is not correlated with the diversity and evenness of other taxa at farms. However, barley production may impact the proportions of forage taxa, especially on Hegranes, where the grass and sedge proportions are directly inversely related, possibly indicating that farms producing barley on Hegranes are growing the crop at the expense of grass. Sedge may have been used to compensate when the prime forage source (grass) could not be utilized.

Historical and archaeological studies have commented on the integral role hay forage played in the maintenance and sustainability of the Icelandic economy (Fridriksson 1972; Amorosi et al. 1996; Adderley et al. 2008). One of the first settlers in Iceland mentioned in the *Landnámabók*, Floki Vilgerdarson and his crew were too preoccupied by fishing in Vatnsfjord that they "forgot to make hay, so their livestock starved to death the following winter" (Pálsson and Edwards 1972:18). From the records of the earliest settlement then, the extreme importance of hay gathering and foddering is manifest.

This thesis sheds new light on the variation of forage across regions and time. As the base of Icelandic economy, the expectation would be that forage taxa would be consistent through time and space. The high frequencies of grasses and sedges by both proportion and density support the notion that the majority of these sampled midden assemblages were deposited as dung-for-fuel and thus allow us a window into the animal forage practices of early Icelandic farmers. The significant variation in proportions and densities between regions and over time shed light on the adaptive capabilities and utilization of the local environment by these farmers. An explanation for these trends is that when suitable grassland was available, the Icelandic farmers utilized it as a primary foraging source. Under this interpretation, when grass forage was restricted, as on Hegranes, farmers significantly increased their marshland and wetland forage practices. This hypothesis is supported by the heavy clustering and high proportions of sedge in Hegranes seed assemblages.

Furthermore, a regional analysis shows significant trends in the forage seed assemblages when barley production was considered. If the interpretation of the seed count trend is correct, it would suggest that Langholt farmers' grass production was not negatively impacted by the co-occurring production of barley. Conversely, Hegranes farmsteads exhibit an increased usage of sedge sources when and where barley was recovered, suggesting that those farms grass production might have been negatively impacted by barley cultivation. Langholt farmers could grow both grass and barley, while Hegranes farmers might have had to emphasize one or the other, and if they chose barley, they used more sedge. This hypothesis is supported by the ethnohistorical data presented by Ignvanson (1969) about the management and usage of sedge resources for hay forage, specifically *Carex lyngbyei* and a few other sedge species. Ignvanson reports on the continued maintenance of marshland sedges, which even during hard freeze years, still manage to produce a successful crop when the grass hay fields fail. Further research on Cyperaceae in the SCASS macrobotanical assemblages could enlighten us on the importance of specific taxa such as *lyngbyei* to the resiliency of farmsteads through environmental and social changes.

The variety of strategies used by the early Skagafjörður farmers may have been an integral factor that promoted the long-term stability of the Viking Age Icelandic chiefdom. The reduction of forage seeds, in both density and proportion, after 1104 AD could represent a decline in productivity or change in production strategies. This decline or change may well have contributed to the emergence of the Medieval consolidated manorial system, and its associated extreme economic inequality.

APPENDIX

APPENDIX A. TAXA IDENTIFIED BY SAMPLE AT HEGRANES FARMS.

Farm	Context - Sample	Context Type	Period	Vol. floated (L)	Total Seeds	Total Charred	Apiaceae	Asteraceae	Leontoden	Taraxacum	Myosotis	Capsella	Caryophyllaceae	Chenopodium	Cyperaceae	Ericaceae	Arctostaphylos	Empetrum	Vaccinium	Fabaceae	Lupinus	Trifolium	Juncaceae	Lamiaceae	Linaceae	Linum	Menyanthes	Epilobium	Rhinanthus	Cereal	cf Avena	Hordeum	Poaceae large	Lolium	Poaceae Wild	Polygonaceae	Polygonum	Rumex	Montia fontana	Portulaca	Potamogeton	Ranunculus	Rosaceae	Rubus	Galium	Violaceae	Viola
Beingarður 440-0	102-1	Midden	Medieval	9	287	158							129		95			11									23								16	5			1			2	5				
Beingarður 440-0	104-5	Midden	Viking	8	525	290							358		96			11									4								25	4			4			1	16				
Beingarður 440-0	105-7	Midden	Viking	8.5	592	297							381		86	1		7									16								11	20			55			4				2	
Beingarður 440-0	106-10	Midden	Viking	8	170	94							65		43			6									21									2			12							4	
Beingarður 440-0	109-15	Floor	Viking	7.5	7	3							1		3																								3								
Beingarður 440-0	109-16	Floor	Viking	8	426	44							301		26			11									8									1			78								
Ríp 441-0	105-6	Midden	Modern	6	8	8							4		2																				2												
Ríp 441-0	105-7	Midden	Modern	15	255	149							106		106			2									7								4							1				2	
Ríp 441-0	106-8	Midden		14	1,130	170						1	968		90			5									7								4				4			1	1				4
Ríp 441-0	106-10	Midden		12	407	368						4	61		226			10									12								24				29		6		20			1	
Ríp 441-0	107-11	Mixed Turf		14	0	0																																									
Ríp 441-0	102-2	Midden	Medieval	6.5	5,335	792							5,080		28			22	1								29									155			11				9				
Ríp 441-0	102-1	Midden	Medieval	6	188	81						1	76		16			3									20										41		2		2	17		1			
Ríp 441-0	102-3	Midden	Medieval	11	25,407	487							25,342		21			5									2								4		17		6				3				
Ríp 441-0	103-4	Midden	Viking	5	18,453	17,735							18,387		38			5									5								8		1		9								
Ríp 441-0	103-5	Midden	Viking	11	32,770	11,641						2	32,694		28			1									4								14		2		17			6				1	
Ríp 441-0	104-6	Midden	Viking	9.5	22,604	8,514							22,538		17			1																	4	3			27			4	3				
Ríp 441-0	105-7	Midden	Viking	6	5,999	342							5,924		31		1	15									1								3		6		5			1	1				
Ríp 441-0	106-9	Midden	Viking	12	19	12				1			11		3																								4								
Ríp 441-0	106-10	Midden	Viking	11	27	26							2		6			2																	1				12								
Ríp 441-0	108-12	Midden	Viking	14	8	1							7		1																																
Ríp 441-0	109-11	Midden	Viking	1.5	3	3							2					1																													
Ríp 441-0	110-15	Midden	Prehistoric	2	0	0																																									
Ríp 441-0	111-14	Aeolian	Prehistoric	3.5	1	0							1																																		
Ríp 441-0	871-13	Tephra	Viking	7	0	0																																									
Ríp 441-0	934-8	Tephra	Viking	3	59	26							31		4			1																	7				16								
Ríp 441-0	102-1	Mixed Turf	Medieval	15	17	17		1					14		1																								1								
Ríp 441-0	103-3	Midden	Viking	15	81	59							25		31																				22							1					
Ríp 441-0	103-4	Midden	Viking	16	82	82							24		20																				35	1											
Ríp 441-0	104-5	Aeolian	Viking	7	3	2							1		1																																
Ríp 441-0	1104-2	Tephra	Medieval	17	28	18							16		5																				6	1											
Ás 442-0	106-1	Mixed Turf	Medieval	7.2	4,437	7							4,322		7			1																			95										12
Ás 442-0	109-2	Midden	Medieval	11	4,714	8				1			3,179		1			3									3								4		2		1,515				6				
Ás 442-0	110-3	Midden	Medieval	11	80	71							14		49			12									2					1							1								
Ás 442-0	111-4	Midden	Medieval	11	67	41						3	23		24			2									2								3		3		1				6				
Ás 442-0	112-5	Midden	Medieval	11.9	41	40							37		1																				3												
Ás 442-0	113-6	Midden	Medieval	12.4	17,331	2		1					15,723		1																				3	23			1,579								1
Ás 442-0	115-7	Midden	Viking	12	55	34							37		9			1											1						2		5										
Ás 442-0	116-8	Midden	Viking	12.4	77	17				2		46	23		3																				1	2											
Ás 442-0	870-9	Tephra	Viking	0.9	3	0						2																							1												
Ás 442-0	122-5	Topsoil	Medieval	14	98	0									3																						1		72				22				
Ás 442-0	123-6	Mixed Turf	Medieval	14	187	13						5	9		7																								107		1		58				
Ás 442-0	124-7	Iron Pan	Viking	21	51	11						3	12		7			1														1							6							21	
Ás 442-0	125-8	Midden	Viking	13	195	100		1					98		73			3	1																6								12		1		
Ás 442-0	126-9	Midden	Viking	15.5	54	50							34		19																				1												
Ás 442-0	127-10	Bog	Viking	15	58	9						43	9		4			1																					1								
Ás 442-0	128-11	Bog	Viking	0.3	1	1							1																																		
Ás 442-0	103-3	Midden	Viking	7	303	284							104		55			44								1		1				2			88								1			1	
Ás 442-0	104-4	Midden	Viking	8	503	493									221			62														2			209		2		1			2					
Ás 442-0	105-6	Midden	Viking	6	515	232							233		139			64													2	15	6		56												
Ás 442-0	106-8	Midden	Viking	7	655	548						10	183		263		3	40														3			56											2	
Ás 442-0	107-10	Midden	Viking	6.5	1,069	1,068							448		329			27																	261				3								
Ás 442-0	108-12	Midden	Viking	6	224	224							78		71			4														4			67												
Ás 442-0	109-14	Midden	Viking	19.5	227	226							104		51			39														8			25												
Ás 442-0	109-16	Midden	Viking	2	0	0																																									
Ás 442-0	109-17	Midden	Viking	8	4	4							3																						1												

Farm	Context - Sample	Context Type	Period	Vol. floated (L)	Total Seeds	Total Charred	Apiaceae	Asteraceae	Leontoden	Taraxacum	Myosotis	Capsella	Caryophyllaceae	Chenopodium	Cyperaceae	Ericaceae	Arctostaphylos	Empetrum	Vaccinium	Fabaceae	Lupinus	Trifolium	Juncaceae	Lamiaceae	Linaceae	Linum	Menyanthes	Epilobium	Rhinanthus	Cereal	cf Avena	Hordeum	Poaceae large	Lolium	Poaceae Wild	Polygonaceae	Polygonum	Rumex	Montia fontana	Portulaca	Potamogeton	Ranunculus	Rosaceae	Rubus	Galium	Violaceae	Viola
Minni-Ás 442-1	106-1	Aeolian	Medieval	5.1	0	0																																										
Minni-Ás 442-1	107-2	Collapse	Medieval	12.5	1	0							1																																				
Minni-Ás 442-1	110-3	Collapse	Medieval	12.4	2	1							2																																				
Minni-Ás 442-1	111-4	Midden	Medieval	12.3	125	125							17		101												1							6													
Minni-Ás 442-1	111-5	Midden	Medieval	6.4	75	72							13		57																				3				2								
Minni-Ás 442-1	112-6	Tephra	Medieval	2.7	16	3						9	4		2			1																															
Minni-Ás 442-1	113-7	Midden	Viking	12.3	96	89							33		44			5																		14													
Minni-Ás 442-1	114-8	Midden	Viking	12.7	66	63							17		41											1		1			3			1				2								
Minni-Ás 442-1	115-1	Cultural Layer	Viking	5.1	3	0									2																																	
Minni-Ás 442-1	116-2	Cultural Layer	Viking	1.9	1	0							1																																				
Minni-Ás 442-1	117-3	Midden	Viking	6.7	9	1													3																												6	
Túnfótur 442-2	104-1	Mixed Turf	Medieval	6.9	21	4							16		3																				2													
Túnfótur 442-2	105-2	LDC	Medieval	12.6	57	4							6		1																							50								
Túnfótur 442-2	107-4	LDC	Viking	12.5	19	8						4	6		8																				1													
Túnfótur 442-2	108-5	Midden	Viking	14.4	165	164							16		138			2																		6	1			1								
Túnfótur 442-2	109-6	Midden	Viking	23.8	804	801						3	59		710			2																		11		18										
Túnfótur 442-2	110-7	Mixed Turf	Viking	14.4	14	5						8	3		2																					1											
Túnfótur 442-2	111-8	Midden	Viking	6.6	173	165						5	17		94			37																		19													
Túnfótur 442-2	111-9	Midden	Viking	2.4	71	71							9		36		1	16																		9													
Túnfótur 442-2	1104-3	Tephra	Medieval	7.6	9	1						1	4		1																					1			2								
Næfurstaðir 442-4	102-2	Aeolian	Medieval	14	7	7							5																						2													
Næfurstaðir 442-4	102-3	Aeolian	Medieval	7	21	21		3					10		6			2																															
Næfurstaðir 442-4	103-6	Midden	Viking	20	41	41		1					26		13			1																															
Næfurstaðir 442-4	104-10	Midden	Viking	15	17	17							9		6			1								1																					
Næfurstaðir 442-4	105-14	Midden	Viking	12.5	5	5							3		2																																
Næfurstaðir 442-4	106-15	Cultural Layer	Viking	14	0	0																																										
Næfurstaðir 442-4	107-18	Midden	Viking	15.5	2	0																													2													
Næfurstaðir 442-4	108-21	Midden	Viking	13	0	0																																										
Næfurstaðir 442-4	108-23	Midden	Viking	6	1	1																																			1					
Næfurstaðir 442-4	934-13	Tephra	Viking	5	8	0							8																																				
Næfurstaðir 442-4	1000-8	Tephra	Viking	5	33	33							22		5																				6													
Næfurstaðir 442-4	1104-4	Tephra	Medieval	8	5	5							5																																				
Næfurstaðir 442-4	111-2	Turf	Medieval	8	35	35							14		9			1																		3				8								
Næfurstaðir 442-4	112-4	Midden	Medieval	9.5	63	63				1			48		8																				5				1								
Næfurstaðir 442-4	113-5	Midden	Viking	8.5	43	39							20		15			2																		4				1								
Næfurstaðir 442-4	114-7	Midden	Viking	8	352	207							282		45			3																		10				6	1		1				1	
Næfurstaðir 442-4	115-9	Midden	Viking	9	43	43							26		11			2																		3				1								
Næfurstaðir 442-4	116-11	Midden	Viking	16	9	9							3		6																																
Næfurstaðir 442-4	117-12	Cultural Layer	Viking	15.5	4	4							2																						2													
Næfurstaðir 442-4	118-14	Midden	Viking	12	1	1							1																																				
Næfurstaðir 442-4	119-16	Midden	Viking	10	35	35							16		7			5																		4													
Næfurstaðir 442-4	119-17	Midden	Viking	8	9	9							3		4			1																						1								
Næfurstaðir 442-4	119-18	Midden	Viking	7	16	16							8		8																																
Næfurstaðir 442-4	871-21	Tephra	Viking	9	0	0																																										
Vatnskot 443-0	103-1	Cultural Layer	Viking	8	113	97							90		19			4																															
Vatnskot 443-0	104-4	Midden	Viking	7	672	650				1			459		90			83												1	5			7													
Vatnskot 443-0	105-5	Midden	Viking	9	598	598							217		210			48																		115	1			3								
Vatnskot 443-0	106-7	Midden	Viking	8	71	71							29		20			4																		18													
Vatnskot 443-0	107-9	Floor	Viking	7	776	776							19		634			31																		76	6						2					
Vatnskot 443-0	108-10	Midden	Viking	8	29	29							1		24			4																															
Vatnskot 443-0	109-13	Aeolian	Viking	6	0	0																																										
Vatnskot 443-0	110-15	Aeolian	Medieval	7.5	51	51							42					2																															
Vatnskot 443-0	111-17	Cultural Layer	Viking	8.5	95	92							75		13			1																															
Vatnskot 443-0	112-19	Midden	Viking	8	1,130	1,126		2					841		96			72					4									11		1	9													
Vatnskot 443-0	112-21	Midden	Viking	7	269	269							127		115			19					1				1				1				4	1											
Vatnskot 443-0	113-22	Midden	Viking	7	187	187							129		42			7														3																
Vatnskot 443-0	114-24	Floor	Viking	7.5	358	358					2		4		305			41					5															1											

Farm	Context - Sample	Context Type	Period	Vol. floated (L)	Total Seeds	Total Charred	Apiaceae	Asteraceae	Leontoden	Taraxacum	Myosotis	Capsella	Caryophyllaceae	Chenopodium	Cyperaceae	Ericaceae	Arctostaphylos	Empetrum	Vaccinium	Fabaceae	Lupinus	Trifolium	Juncaceae	Lamiaceae	Linaceae	Linum	Menyanthes	Epilobium	Rhinanthus	Cereal	cf Avena	Hordeum	Poaceae large	Lolium	Poaceae Wild	Polygonaceae	Polygonum	Rumex	Montia fontana	Portulaca	Potamogeton	Ranunculus	Rosaceae	Rubus	Galium	Violaceae	Viola
Vatnskot 443-0	115-25	Midden	Viking	8	8	8							1		4			1																													
Vatnskot 443-0	116-1	Aeolian	Medieval	9.5	16	4							12		4																																
Vatnskot 443-0	116-2	Aeolian	Medieval	7.5	25	3							22		2																				1												
Vatnskot 443-0	117-4	Cultural Layer	Viking	7	152	67							117	3	11			10																	11												
Vatnskot 443-0	117-5	Cultural Layer	Viking	17	91	23							68	8	7			5																	3												
Vatnskot 443-0	120-9	Midden	Viking	16	1,022	928							740		85			149														2			42												
Vatnskot 443-0	120-10	Midden	Viking	16	2,014	2,002						4	1,695		124			60	1				1									7			111				3				4				
Vatnskot 443-0	121-12	Midden	Viking	18	1,307	1,242						2	741		242		1	120					2									2			185		2			2							1
Vatnskot 443-0	121-13	Midden	Viking	18	1,776	1,757							1,184		283		2	82				1										2			207		3		1	1		1	4				4
Vatnskot 443-0	121-15	Midden	Viking	15	962	960							480		236		1	67													1				163			1	2			1					2
Vatnskot 443-0	121-16	Midden	Viking	15	1,524	1,518						1	844		393		2	48	1											1		3			221				4			1	1			3	
Vatnskot 443-0	121-18	Midden	Viking	16	613	613							210	2	256			22																	123												
Vatnskot 443-0	122-19	Midden	Viking	17	1,016	1,006						3	623	2	107			105														6			51		1										
Vatnskot 443-0	122-20	Midden	Viking	14	256	256							140		49			55																	11												
Vatnskot 443-0	123-22	Midden	Viking	15	251	221						23	99		78			12	1													2			34												1
Vatnskot 443-0	123-23	Midden	Viking	15	739	513						226	199		182			20	1													3			104				2							1	
Vatnskot 443-0	124-26	Floor	Viking	8	1,252	1,240						13	473		310		1	24				1					1					1			424				2			1				1	
Vatnskot 443-0	124-27	Floor	Viking	8	1,884	1,867						14	718		335			33	1								2								774				1	2	1						
Vatnskot 443-0	125-29	Midden	Viking	7.5	6	6									1			3																	2												
Vatnskot 443-0	125-30	Midden	Viking	8	5	5									2			2																	1												
Garður 444-0	106-1	Midden	Viking	12	22	22							16		6																																
Garður 444-0	106-2	Midden	Viking	10	26	15						10	9		6												1																				
Garður 444-0	108-3	Midden	Viking	4.3	30	8		1			1		18		3																				2		1		3								1
Garður 444-0	871-4	Tephra	Viking	5.5	2	0							1					1																													
Hegranesþing South 444-1	102-1	Aeolian	Viking	6	4	0									2																				2												
Hegranesþing South 444-1	102-2	Aeolian	Viking	8.5	7	1			2						1								4																								
Hegranesþing South 444-1	103-3	Collapse	Viking	8.5	6	4			1														4																								
Hegranesþing South 444-1	103-4	Collapse	Viking	8	0	0																																									
Hegranesþing South 444-1	104-5	Collapse	Viking	7	0	0																																									
Hegranesþing South 444-1	104-6	Collapse	Viking	9	1	0			1																																						
Hegranesþing South 444-1	105-7	Collapse	Viking	7	1	1																													1												
Hegranesþing South 444-1	105-8	Collapse	Viking	7	0	0																																									
Hegranesþing South 444-1	106-10	Collapse	Viking	8	0	0																																									
Hegranesþing South 444-1	106-11	Collapse	Viking	7	0	0																																									
Hegranesþing South 444-1	107-13	Collapse	Viking	6.5	0	0																																									
Hegranesþing South 444-1	107-14	Collapse	Viking	8	0	0																																									
Hegranesþing South 444-1	108-16	Collapse	Viking	6.5	0	0																																									
Hegranesþing South 444-1	108-17	Collapse	Viking	7.5	0	0																																									
Hegranesþing South 444-1	109-19	Wall	Viking	5.5	1	0																													1												
Hegranesþing South 444-1	110-21	Midden	Viking	6.5	6	1			2				1		1														2																		
Hegranesþing South 444-1	110-22	Midden	Viking	3.5	5	0																							4														1				
Hegranesþing South 444-1	111-23	Midden	Viking	6	1	1									1																																
Hegranesþing South 444-1	111-24	Midden	Viking	8	10	10									5			3																													
Hegranesþing South 444-1	112-26	Midden	Viking	6	1	0																													1												
Hegranesþing South 444-1	112-27	Midden	Viking	7	7	6									1			1																	5												
Hegranesþing South 444-1	113-30	Midden	Viking	7	4	4							1		3																																
Hegranesþing South 444-1	113-31	Midden	Viking	7.5	4	4							1		3																																
Hegranesþing South 444-1	113-34	Midden	Viking	4	3	3						1			1																				1												
Hegranesþing South 444-1	113-35	Midden	Viking	8	9	8							1		2									1											4				1								
Hegranesþing South 444-1	114-37	Midden	Viking	1.5	2	2									1			1																													
Hegranesþing South 444-1	115-39	Mixed Turf	Viking	8	3	1									2														1																		
Hegranesþing South 444-1	115-40	Mixed Turf	Viking	9	1	0																																									
Hegranesþing South 444-1	116-42	Mixed Turf	Viking	7.5	9	0																							8						1												
Hegranesþing South 444-1	116-43	Mixed Turf	Viking	7.5	0	0																																									
Hegranesþing South 444-1	116-45	Mixed Turf	Viking	7	2	0									2																																
Hegranesþing South 444-1	116-46	Mixed Turf	Viking	7	2	0																																									

Farm	Context - Sample	Context Type	Period	Vol. floated (L)	Total Seeds	Total Charred	Apiaceae	Asteraceae	Leontoden	Taraxacum	Myosotis	Capsella	Caryophyllaceae	Chenopodium	Cyperaceae	Ericaceae	Arctostaphylos	Empetrum	Vaccinium	Fabaceae	Lupinus	Trifolium	Juncaceae	Lamiaceae	Linaceae	Linum	Menyanthes	Epilobium	Rhinanthus	Cereal	cf Avena	Hordeum	Poaceae large	Lolium	Poaceae Wild	Polygonaceae	Polygonum	Rumex	Montia fontana	Portulaca	Potamogeton	Ranunculus	Rosaceae	Rubus	Galium	Violaceae	Viola
Hegranesþing South 444-1	117-47	Mixed Turf	Viking	7	0	0																																									
Hegranesþing South 444-1	117-48	Mixed Turf	Viking	6	2	0									1																																
Hegranesþing South 444-1	118-50	Aeolian	Prehistoric	6	2	1												1																													
Hegranesþing South 444-1	118-51	Aeolian	Prehistoric	7.5	2	0																							1																		
Hegranesþing South 444-1	119-53	Aeolian	Prehistoric	7.5	3	1																													1												
Hegranesþing South 444-1	119-54	Aeolian	Prehistoric	6.5	1	0																																									
Hegranesþing South 444-1	120-55	Aeolian	Prehistoric	7.5	0	0																																									
Hegranesþing South 444-1	120-56	Aeolian	Prehistoric	7.5	1	0																													1												
Hegranesþing South 444-1	871-52	Tephra	Prehistoric	0.25	0	0																																									
Hegranesþing South 444-1	121-60	Aeolian	Medieval	7.5	3	2									3																																
Hegranesþing South 444-1	121-61	Aeolian	Medieval	7.5	1	0																							1																		
Hegranesþing South 444-1	122-63	Mixed Turf	Medieval	10	9	3							1		2																												6				
Hegranesþing South 444-1	122-64	Mixed Turf	Medieval	9	2	2									1																								1								
Hegranesþing South 444-1	123-66	Mixed Turf	Medieval	9.5	0	0																																									
Hegranesþing South 444-1	123-67	Mixed Turf	Medieval	9.5	10	0																							8																		
Hegranesþing South 444-1	124-68	Mixed Turf	Medieval	8	0	0																																									
Hegranesþing South 444-1	124-69	Mixed Turf	Medieval	7.5	0	0																																									
Hegranesþing South 444-1	125-71	Aeolian	Medieval	8	2	0																							2																		
Hegranesþing South 444-1	125-72	Aeolian	Medieval	8.5	4	1							1		1														2																		
Hegranesþing South 444-1	126-75	Cultural Layer	Viking	10	1	1									1																																
Hegranesþing South 444-1	126-76	Cultural Layer	Viking	8	4	4							1		2			1																													
Hegranesþing South 444-1	126-78	Cultural Layer	Viking	8	2	2									1			1																													
Hegranesþing South 444-1	126-79	Cultural Layer	Viking	8	4	2							2					1																													
Hegranesþing South 444-1	127-80	Midden	Viking	7.5	20	20									9			1																					1				3				
Hegranesþing South 444-1	127-81	Midden	Viking	9	47	47									37			2							1		3								1	2			1								
Hegranesþing South 444-1	127-82	Midden	Viking	6.5	86	85							5		44			10							2		7		1						5				12								
Hegranesþing South 444-1	128-84	Midden	Viking	8	586	586		1					3		336			7							8		12								1				216								
Hegranesþing South 444-1	128-85	Midden	Viking	7	91	91									52			1									36																				
Hegranesþing South 444-1	128-86	Midden	Viking	8	184	140									134			2									5												40								
Hegranesþing South 444-1	128-87	Midden	Viking	7.5	17	17									10												7																				
Hegranesþing South 444-1	129-88	Midden	Viking	5	26	25									19			2																		1											
Hegranesþing South 444-1	129-89	Midden	Viking	9.5	68	68							2		62												1												3								
Hegranesþing South 444-1	130-90	Midden	Viking	7	91	91							5		45			7																	3	2			27								1
Hegranesþing South 444-1	130-91	Midden	Viking	8	122	122									97			21									1									3											
Hegranesþing South 444-1	131-93	Post Hole	Viking	0.5	0	0																																									
Hegranesþing South 444-1	132-94	Aeolian	Viking	7.5	0	0																																									
Hegranesþing South 444-1	132-95	Aeolian	Viking	7.5	0	0																																									
Hegranesþing South 444-1	135-140	Aeolian	Medieval	9.5	3	0																																									
Hegranesþing South 444-1	135-141	Aeolian	Medieval	8	3	0									2																				1												
Hegranesþing South 444-1	136-144	Aeolian	Medieval	8	0	0																																									
Hegranesþing South 444-1	136-145	Aeolian	Medieval	7	1	1																																									
Hegranesþing South 444-1	137-147	Midden	Medieval	8	2	2							1		1																																
Hegranesþing South 444-1	137-148	Midden	Medieval	7.5	8	0																																	8								
Hegranesþing South 444-1	138-150	Midden	Medieval	8	7	6									1																				6												
Hegranesþing South 444-1	138-151	Midden	Medieval	8	9	8									4														1						4												
Hegranesþing South 444-1	139-154	Midden	Medieval	8	14	13									3				1																7												
Hegranesþing South 444-1	139-155	Midden	Medieval	6.5	58	56						2	3		7				2																27												
Hegranesþing South 444-1	139-156	Midden	Medieval	15	41	41								1	9																				26												
Hegranesþing South 444-1	140-159	Aeolian	Medieval	7	2	1							1																																		
Hegranesþing South 444-1	140-160	Aeolian	Medieval	7	0	0																																									
Hegranesþing South 444-1	142-165	Aeolian	Viking	8	1	0												1																													
Hegranesþing South 444-1	142-166	Aeolian	Viking	9	0	0																																									
Hegranesþing South 444-1	1104-163	Tephra	Medieval	7	3	2							3																																		
Hegranesþing South 444-1	1104-164	Tephra	Medieval	8	0	0																																									
Hegranesþing South 444-1	1300-142	Tephra	Medieval	7.5	0	0																																									
Hegranesþing South 444-1	1300-143	Tephra	Medieval	6	13	5							2					1											7																		

Farm	Context - Sample	Context Type	Period	Vol. floated (L)	Total Seeds	Total Charred	Apiaceae	Asteraceae	Leontoden	Taraxacum	Myosotis	Capsella	Caryophyllaceae	Chenopodium	Cyperaceae	Ericaceae	Arctostaphylos	Empetrum	Vaccinium	Fabaceae	Lupinus	Trifolium	Juncaceae	Lamiaceae	Linaceae	Linum	Menyanthes	Epilobium	Rhinanthus	Cereal	cf Avena	Hordeum	Poaceae large	Lolium	Poaceae Wild	Polygonaceae	Polygonum	Rumex	Montia fontana	Portulaca	Potamogeton	Ranunculus	Rosaceae	Rubus	Galium	Violaceae	Viola
Hegranesþing South 444-1	1300-143	Tephra	Medieval	6	13	5							2					1											7																		
Hegranesþing South 444-1	144-168	Aeolian	Medieval	5	12	0						2			8														1																		
Hegranesþing South 444-1	145-171	Aeolian	Medieval	9	2	0							1		1																																
Hegranesþing South 444-1	146-169	Turf	Medieval	9	1	1																																									
Hegranesþing South 444-1	147-170	Aeolian	Medieval	7	25	3			6			1			7														7														2				
Hegranesþing South 444-1	148-172	Turf	Medieval	8	32	32						1	1		7				3																17											1	
Hegranesþing South 444-1	148-173	Turf	Medieval	7	1	1							1																																		
Hegranesþing South 444-1	149-176	Aeolian	Viking	7.5	3	0							1																																	2	
Hegranesþing South 444-1	150-180	Turf	Viking	8.5	2	2																													2												
Hegranesþing South 444-1	150-181	Turf	Viking	7.5	2	0						2																																			
Hegranesþing South 444-1	874-178	Tephra	Viking	8.5	1	0																							1																		
Hegranesþing South 444-1	1104-179	Tephra	Medieval	8	4	4									4																																
Hegranesþing South 444-1	1300-175	Tephra	Medieval	5.5	24	0						14	1		6																															3	
Keflavík 445-0	123-2	Midden	Viking	15.5	10,611	233							2,873		5																								7,733								
Keflavík 445-0	124-3	Aeolian	Viking	6.5	298	3							3		3																								292								
Keflavík 445-0	131-126	Midden	Medieval	10	909	118							866		10			8																	7	3			15								
Keflavík 445-0	132-127	Midden	Medieval	11.5	631	16							615		7			6																	3												
Keflavík 445-0	132-128	Midden	Medieval	14	909	585						29	806		14			4				1													36		2		11			3	3				
Keflavík 445-0	133-129	Midden	Viking	6.5	191	67							186		3			2																													
Keflavík 445-0	133-130	Midden	Viking	7	77	12							72		1			1													1				2												
Keflavík 445-0	134-131	Midden	Viking	6	157	112						9	144		2																				1											1	
Keflavík 445-0	871-132	Tephra	Viking	8	74	0							74																																		
Keflavík Cemetery 445-1	135-109	Collapse		7.5	37	36							32		1																																
Keflavík Cemetery 445-1	148-202	Floor		7.5	32	0							32																																		
Þrælagerði 445-2	103-2	Midden	Viking	15	1	0																																									
Þrælagerði 445-2	104-5	Midden	Viking	15	1	1							1																																		
Þrælagerði 445-2	871-10	Tephra	Viking	7	0	0																																									
Grænakot / Vík 445-3	102-1	Aeolian	Modern	9	1	1									1																																
Grænakot / Vík 445-3	103-2	Midden	Viking	18.5	234	229							10		95			50																					3		5					5	
Grænakot / Vík 445-3	103-3	Midden	Viking	15	71	70							9		35			13																													
Grænakot / Vík 445-3	103-5	Midden	Viking	6.5	97	97						5	6		52			5					3																		4					2	
Grænakot / Vík 445-3	103-6	Midden	Viking	6.5	106	81						2	6		37			13																		3					4						
Grænakot / Vík 445-3	104-7	Fill	Viking	16.5	9	9									4			2																													
Grænakot / Vík 445-3	104-8	Fill	Viking	7	6	6						2			4																																
Grænakot / Vík 445-3	105-9	Pavement	Viking	16	72	72							4		59			8																					1								
Grænakot / Vík 445-3	106-10	Midden	Viking	16.5	935	935							26		832			77																													
Grænakot / Vík 445-3	106-12	Midden	Viking	16	797	797					6	1	74		565			131														3				1			16								
Grænakot / Vík 445-3	106-14	Midden	Viking	14.5	467	467							71		309			65														3											1			5	
Grænakot / Vík 445-3	107-15	Aeolian	Prehistoric	8	7	4						1			2																																
Kriki 445-4	102-1	LDC	Medieval	7	0	0																																									
Kriki 445-4	103-3	Aeolian	Viking	13	1	0									1																																
Kriki 445-4	104-4	Midden	Viking	13.5	0	0																																									
Kriki 445-4	105-5	Midden	Viking	13	0	0																																									
Kriki 445-4	871-6	Tephra	Viking	13	0	0																																									
Kriki 445-4	1104-2	Aeolian	Medieval	14	0	0																																									
Lower Keflavík 445-6	125-1	Aeolian	Medieval	7	6	2							2		3																												1				
Lower Keflavík 445-6	126-5	Midden	Viking	9	86	86							33		11			31																	7				3								
Lower Keflavík 445-6	127-7	Midden	Viking	15	542	411							164		63			57					2									2			21				1							1	
Lower Keflavík 445-6	128-9	Midden	Viking	24	761	761							416		23			120									1					2			87				4			1					
Lower Keflavík 445-6	129-12	Cultural Layer	Viking	8	25	25							11		4			4																													
Lower Keflavík 445-6	130-15	Cultural Layer	Viking	7	8	8							1		3			4																													
Lower Keflavík 445-6	871-14	Tephra	Viking	7	15	15							6		2			7																													
Lower Keflavík 445-6	871-17	Tephra	Viking	1	0	0																																									
Lower Keflavík 445-6	934-11	Tephra	Viking	8	7	7																																									
Lower Keflavík 445-6	1104-3	Tephra	Medieval	7	16	16							8					4																	3	1											
Utanverðunes 446-0	105-1	Midden	Medieval	7	22	4							2		1			1																					18								
Utanverðunes 446-0	107-3	Midden	Viking	6.5	46	0									3																								43								

Farm	Context - Sample	Context Type	Period	Vol. floated (L)	Total Seeds	Total Charred	Apiaceae	Asteraceae	Leontoden	Taraxacum	Myosotis	Capsella	Caryophyllaceae	Chenopodium	Cyperaceae	Ericaceae	Arctostaphylos	Empetrum	Vaccinium	Fabaceae	Lupinus	Trifolium	Juncaceae	Lamiaceae	Linaceae	Linum	Menyanthes	Epilobium	Rhinanthus	Cereal	cf Avena	Hordeum	Poaceae large	Lolium	Poaceae Wild	Polygonaceae	Polygonum	Rumex	Montia fontana	Portulaca	Potamogeton	Ranunculus	Rosaceae	Rubus	Galium	Violaceae	Viola
Utanverðunes 446-0	107-5	Midden	Viking	7	105	102							15		7																				4				76								
Utanverðunes 446-0	108-7	Hearth	Viking	7.5	8	5							3		2																				3												
Utanverðunes 446-0	108-9	Hearth	Viking	7.5	183	119							87		11			10																	11				61			2	1				
Utanverðunes 446-0	109-11	Cultural Layer	Viking	7	1,002	940							224		220			482														1			6				62			7					
Utanverðunes 446-0	110-12	Upcast	Viking	7	0	0																																									
Utanverðunes 446-0	113-15	Floor	Viking	2.5	1	1																													1												
Utanverðunes 446-0	114-16	Floor	Viking	7	270	269							21		238			2																	5							4					
Utanverðunes 446-0	115-18	Mixed Turf	Viking	7	11	11							3		7			1																													
Utanverðunes 446-0	116-21	Midden	Viking	65.5	17	14							4		9			1																	3												
Utanverðunes 446-0	104-2	Midden	Viking	8	769	163		2					575		41			2									1								9	2			28			3					
Utanverðunes 446-0	105-3	Midden	Viking	9	85	66							19		38			10									1												10								
Utanverðunes 446-0	105-5	Midden	Viking	5	33	33							4		6			4					19																								
Utanverðunes 446-0	105-6	Midden	Viking	7	78	75							6		38			31																					3								
Utanverðunes 446-0	106-7	Aeolian	Prehistoric	7	4	3							3		1																																
Helluland 447-0	102-1	LDC	Medieval	14.5	8	8									7																								1								
Helluland 447-0	103-4	Midden	Viking	17	96	96							52		30			13																					1								
Helluland 447-0	103-5	Midden	Viking	14	281	211							140		41			69														1			26												
Helluland 447-0	103-6	Midden	Viking	14	240	222							47		102			27																					6								
Helluland 447-0	104-8	Midden	Viking	16	0	0																																									
Helluland 447-0	104-9	Midden	Viking	7	0	0																																									
Helluland 447-0	105-10	Aeolian	Prehistoric	6	0	0																																									
Helluland 447-0	871-12	Tephra	Viking	14	1	1							1																																		
Helluland 447-0	1000-7	Tephra	Viking	3.5	0	0																																									
Helluland 447-0	1104-2	Tephra	Medieval	6.5	4	4							1					3																													
Grænagerði 447-1	102-2	Aeolian	Viking	7.5	19	8			1				9					2											1			2															
Grænagerði 447-1	103-3	Midden	Viking	16	161	159			1				66		50			26			1		2							1		3			1												
Grænagerði 447-1	103-5	Midden	Viking	13	103	96			2				10		40			27	1												16				1	1						2			2	1	
Grænagerði 447-1	103-6	Midden	Viking	7	17	17							2		6			6													3																
Grænagerði 447-1	104-7	Midden	Viking	14.5	31	27			3			1	2		7			14													1														2		
Grænagerði 447-1	104-9	Midden	Viking	6.5	5	5							1		3																															1	
Grænagerði 447-1	105-1	Aeolian	Medieval	19	14	14							7		5			2																													
Grænagerði 447-1	105-16	Aeolian	Medieval	15	46	41							24		13			2	1													3											2				
Grænagerði 447-1	105-17	Aeolian	Medieval	14	17	14							2		4			5														3					1						2				
Grænagerði 447-1	106-3	Midden	Viking	18.5	183	183							79		52			37													1	6			8												
Grænagerði 447-1	106-7	Midden	Viking	16	123	114							56		22			34																	10							1					
Grænagerði 447-1	106-19	Midden	Viking	14.5	181	172							54		53		3	43												3		7			18												
Grænagerði 447-1	106-20	Midden	Viking	15	145	141							52		38			43		1			1							1		1			2									5			
Grænagerði 447-1	106-24	Midden	Viking	17	56	56							11		18			23													2	2															
Grænagerði 447-1	106-25	Midden	Viking	15	104	103							4		48			30												9	6				5								1				
Grænagerði 447-1	107-8	Tephra	Viking	8	3	2									2			1																													
Grænagerði 447-1	107-26	Tephra	Viking	14.5	11	11							3		3			1				1					1																				
Grænagerði 447-1	107-27	Tephra	Viking	14	14	14									4			9																													
Grænagerði 447-1	108-11	Midden	Viking	16	3	3							1					2																													
Grænagerði 447-1	108-14	Midden	Viking	16	34	34									24			5																	3												
Grænagerði 447-1	108-15	Midden	Viking	18	17	17									10			6									1																				
Grænagerði 447-1	108-30	Midden	Viking	14	12	12							2		7			3																													
Grænagerði 447-1	108-31	Midden	Viking	15	12	12							1		4			7																													
Grænagerði 447-1	108-33	Midden	Viking	16	88	88							3		56			11					1												17												
Grænagerði 447-1	108-34	Midden	Viking	16	33	33									23			5														1			4												
Grænagerði 447-1	108-35	Midden	Viking	7	0	0																																									
Grænagerði 447-1	110-36	Pit	Viking	6	54	54							14		11			4									1								24												
Kotið 447-2	102-1	Midden	Viking	14	145	142							1		116			23																	1									1			
Kotið 447-2	103-2	Midden	Viking	12.5	107	103		1					13		82			7																	1								3				
Kotið 447-2	103-3	Midden	Viking	15	59	59							5		26			13																													
Kotið 447-2	103-4	Midden	Viking	29	18	13							7		6		1																		2								2				
Kotið 447-2	871-5	Tephra	Viking	8	1	1																																									

Farm	Context - Sample	Context Type	Period	Vol. floated (L)	Total Seeds	Total Charred	Apiaceae	Asteraceae	Leontoden	Taraxacum	Myosotis	Capsella	Caryophyllaceae	Chenopodium	Cyperaceae	Ericaceae	Arctostaphylos	Empetrum	Vaccinium	Fabaceae	Lupinus	Trifolium	Juncaceae	Lamiaceae	Linaceae	Linum	Menyanthes	Epilobium	Rhinanthus	Cereal	cf Avena	Hordeum	Poaceae large	Lolium	Poaceae Wild	Polygonaceae	Polygonum	Rumex	Montia fontana	Portulaca	Potamogeton	Ranunculus	Rosaceae	Rubus	Galium	Violaceae	Viola
Kotið 447-2	104-3	Midden	Viking	15	307	307							5		240			41	1																4												
Kotið 447-2	104-4	Midden	Viking	15	92	92							6		48			17																	7												
Kotið 447-2	105-6	Midden	Viking	13	12	12							1		7			3																													
Kotið 447-2	105-7	Midden	Viking	6	40	40									7																																
Kotið 447-2	105-8	Midden	Viking	5	190	190							17		66			17														1			4												
Ásgrímsstaðir 447-4	103-3	Midden	Medieval	14	56	24							7		16		1	23									3								1				5								
Ásgrímsstaðir 447-4	104-4	Midden	Viking	11	1,634	130		1					106		7			2																					1,504				14				
Ásgrímsstaðir 447-4	105-6	Midden	Viking	12.5	2,140	14							12		3																								2,123				2				
Ásgrímsstaðir 447-4	105-7	Midden	Viking	11.5	5,000	4,999							15		4			2																	7				4,971				1				
Ásgrímsstaðir 447-4	106-9	Aeolian	Viking	11.5	12,285	8							3		3																				2				12,277								
Ásgrímsstaðir 447-4	107-10	Midden	Viking	8.5	190	182							18		67	12		4	3											11	2	1			17				2								
Ásgrímsstaðir 447-4	108-11	Aeolian	Viking	10	2	2									2																																
Ásgrímsstaðir 447-4	109-12	Midden	Viking	11	5	5							2		1																	1			1												
Ásgrímsstaðir 447-4	110-15	Aeolian	Prehistoric	5.5	0	0																																									
Ásgrímsstaðir 447-4	871-14	Tephra	Viking	6	0	0																																									
Ásgrímsstaðir 447-4	1000-8	Tephra	Viking	3.5	3,025	3,022							1		1																				1				3,019				3				
Ásgrímsstaðir 447-4	103-1	Cultural Layer	Medieval	8	0	0																																									
Ásgrímsstaðir 447-4	104-2	Fill	Viking	7	0	0																																									
Ásgrímsstaðir 447-4	105-4	Midden	Viking	6	32	32							6		24			1																	1												
Ásgrímsstaðir 447-4	106-5	Aeolian	Prehistoric	7	2	2									1																				1												
Hróarsdalur 449-0	105-1	Midden	Medieval	4	317	41							266		4			5	2																	35			5								
Hróarsdalur 449-0	106-2	Midden	Viking	12	15,151	27							15,029		53			13									8		4						6	30			4			4					
Hróarsdalur 449-0	106-3	Midden	Viking	12	33,348	33,054		2		60			32,992		56			14									9								10	154			49			1					
Hróarsdalur 449-0	107-4	Fire Pit	Viking	5	551	313						42	220		270			1								1	1								1	12			3								
Hróarsdalur 449-0	108-5	Midden	Viking	12.5	64,661	254							64,363		110			136									6								2	1			43								
Hróarsdalur 449-0	108-6	Midden	Viking	10.5	19,000	8							18,976		7																				1				16								
Hróarsdalur 449-0	109-7	Midden	Viking	12	2,977	14						3	2,933		11			2																	2				24								
Hróarsdalur 449-0	110-8	Aeolian	Viking	13.5	38	0						1	37																																		
Hróarsdalur 449-0	871-11	Tephra	Viking	10.5	2	0							1																										1								
Keldudalur 450-0	102-2	Midden	Medieval	13.5	13	11							2		10																					1											
Keldudalur 450-0	103-3	Midden	Medieval	14	105	99							35		60			2				1													4				2								1
Keldudalur 450-0	104-4	Midden	Medieval	14.5	51	37							17		13			5																	2				14								
Keldudalur 450-0	105-6	Midden	Viking	15	72	64						5	44		9			1		2															8				3								
Keldudalur 450-0	106-8	Midden	Viking	12	21	19						1	1		13			2																	4												
Keldudalur 450-0	107-9	Cultural Layer	Viking	13	6	2						2	4																																		
Keldudalur 450-0	871-10	Tephra	Viking	5.8	8	0						3																							4	1											
Keldudalur 450-0	1104-5	Tephra	Medieval	6.3	12	6							6		2																				2				2								
Keldudalur 450-0	1300-1	Tephra	Medieval	7.5	10	5							2		2																					2											
Stekkjarborg 450-1	114-1	Midden	Viking	7.8	418	396							27	2	231				2													4				152											
Stekkjarborg 450-1	119-1	Midden	Viking	5.8	3	0							3																																		
Stekkjarborg 450-1	871-2	Tephra	Viking	5.5	1	0							1																																		
Stekkjarborg 450-1	102-1	Plow zone	Modern	15	91	87							87																								1						3				
Stekkjarborg 450-1	103-2	Fill	Viking	7.5	0	0																																									
Stekkjarborg 450-1	103-3	Fill	Viking	18.5	0	0																																									
Stekkjarborg 450-1	104-5	Midden	Viking	9	0	0																																									
Stekkjarborg 450-1	104-7	Midden	Viking	15.5	0	0																																									
Stekkjarborg 450-1	104-9	Midden	Viking	2.5	0	0																																									
Stekkjarborg 450-1	105-12	Mixed Turf	Prehistoric	15.5	0	0																																									
Stekkjarborg 450-1	102-1	Plow zone	Modern	8	190	190							188																								2										
Stekkjarborg 450-1	102-2	Plow zone	Modern	7.5	0	0																																									
Stekkjarborg 450-1	103-3	Midden	Viking	7	5,120	2,560							5,120																																		
Stekkjarborg 450-1	104-5	Midden	Viking	4	0	0																																									
Stekkjarborg 450-1	105-6	Tephra	Viking	7	3	3							3																																		
Stekkjarborg 450-1	105-11	Tephra	Viking	3.5	0	0																																									
Stekkjarborg 450-1	106-10	Mixed Turf	Viking	4.5	3	2							2																																	1	
Stekkjarborg 450-1	106-13	Mixed Turf	Viking	8	0	0																																									

Farm	Context - Sample	Context Type	Period	Vol. floated (L)	Total Seeds	Total Charred	Apiaceae	Asteraceae	Leontoden	Taraxacum	Myosotis	Capsella	Caryophyllaceae	Chenopodium	Cyperaceae	Ericaceae	Arctostaphylos	Empetrum	Vaccinium	Fabaceae	Lupinus	Trifolium	Juncaceae	Lamiaceae	Linaceae	Linum	Menyanthes	Epilobium	Rhinanthus	Cereal	cf Avena	Hordeum	Poaceae large	Lolium	Poaceae Wild	Polygonaceae	Polygonum	Rumex	Montia fontana	Portulaca	Potamogeton	Ranunculus	Rosaceae	Rubus	Galium	Violaceae	Viola
Stekkjarborg 450-1	107-15	Midden	Viking	8.5	0	0																																									
Stekkjarborg 450-1	107-17	Midden	Viking	4.5	0	0																																									
Stekkjarborg 450-1	108-18	Cultural Layer	Viking	6	0	0																																									
Stekkjarborg 450-1	109-19	Mixed Turf	Prehistoric	8	1	1							1																																		
Stekkjarborg 450-1	110-20	Mixed Turf	Prehistoric	8.5	0	0																																									
Stekkjarborg 450-1	110-21	Mixed Turf	Prehistoric	8	0	0																																									
Stekkjarborg 450-1	111-22	Aeolian	Prehistoric	8	0	0																																									
Stekkjarborg 450-1	112-23	Aeolian	Prehistoric	6	0	0																																									
Gerði 450-2	103-2	Midden	Viking	16.5	6	1							5																																		
Gerði 450-2	104-4	Cultural Layer	Viking	14.5	3	1							2																																		
Gerði 450-2	105-6	Midden	Viking	13	282	281							15		239			3														5			2	7											
Gerði 450-2	105-9	Midden	Viking	13	261	260							12		196			4									1					12			24								2				
Gerði 450-2	105-10	Midden	Viking	4	0	0																																									
Gerði 450-2	105-11	Midden	Viking	8	4	1									1																																
Egg 451-0	102-1	Aeolian	Medieval	7	63	35				1			51		4																					7											
Egg 451-0	103-3	Aeolian	Viking	6.5	64	40				10			28		8			3																		14											
Egg 451-0	104-4	Midden	Viking	5.5	46	33				5			21		10			1					1													8											
Egg 451-0	104-5	Midden	Viking	6	33	12				4			19		3																					6			1								
Egg 451-0	105-6	Midden	Prehistoric	12	119	49		2		11			45		29			3																		22											
Egg 451-0	105-7	Midden	Prehistoric	12	44	31				4			24		10																					4										2	
Egg 451-0	105-8	Midden	Prehistoric	11	10	8							2		5																	1			2												
Egg 451-0	107-9	Aeolian	Prehistoric	5.5	54	25						1	16		8																				26	3											
Egg 451-0	108-10	Cultural Layer	Viking	12.5	48	30				10			25		5																					6											
Egg 451-0	108-11	Cultural Layer	Viking	1.5	7	4							4																							3											
Egg 451-0	108-12	Cultural Layer	Viking	5	26	7				5			6		1																					6											
Egg 451-0	109-13	Hearth	Viking	12	80	40				9		1	13		19																				32	6											
Egg 451-0	110-14	Upcast	Viking	6	39	29				3			14		11																				11												
Egg 451-0	110-15	Upcast	Viking	11.5	30	16				1			13		3			1																	10	2											
Egg 451-0	110-16	Upcast	Viking	5.5	17	6				4			6																						5	2											
Egg 451-0	111-17	Aeolian	Prehistoric	10	33	9		2		2			9																						17	3											
Egg 451-0	112-23	Hearth	Viking	2	3	1							1																						1	1											
Egg 451-0	1104-2	Tephra	Medieval	6.5	24	9				6			8		1																					8											
Egg 451-0	115-25	Midden	Medieval	8.5	14	14						1	1		11			1																													
Egg 451-0	116-26	Midden	Medieval	9	5	5							1		3																				1												
Egg 451-0	117-28	Midden	Medieval	8.5	22	22							2		17																								3								
Egg 451-0	117-29	Midden	Medieval	8	0	0																																									
Egg 451-0	118-30	Mixed Turf	Medieval	7	0	0																																									
Egg 451-0	119-31	Midden	Viking	8	8	4							4																						2	1			1								
Egg 451-0	120-32	Midden	Viking	8	49	44					1		5		12																	1				3											
Egg 451-0	121-35	Midden	Viking	7	25	25							1		2			5																													
Egg 451-0	122-37	Aeolian	Viking	7	0	0																																									
Egg 451-0	123-38	Midden	Viking	1.5	0	0																																									
Egg 451-0	125-40	Cultural Layer	Medieval	3	108	28						1	23		3				1																	3			70			7					
Egg 451-0	126-41	Midden	Medieval	5.5	60	8							7																						1	1			45			6					
Egg 451-0	127-43	Midden	Viking	3.5	1	0							1																																		
Egg 451-0	128-44	Cultural Layer	Viking	4.5	2	2							2																																		
Egg 451-0	129-45	Aeolian	Viking	2	0	0																																									
Egg 451-0	1104-42	Tephra	Medieval	1	0	0																																									
Egg 451-0	1300-39	Tephra	Medieval	1.5	189	19							19		1																								118			4					
Egg 451-0	102-1	Midden	Viking	6	89	89							67		18																	1			2												
Egg 451-0	103-2	Midden	Medieval	7	38	38							20		5			2																	4							1	2				
Minni-Egg 451-1	104-5	Midden	Viking	12	7	7							6		1																																
Minni-Egg 451-1	104-6	Midden	Viking	13	1	1																										1															
Rein 452-0	103-1	Aeolian	Medieval	8	14	13							2		7			3																	1												
Rein 452-0	104-2	Midden	Viking	8	95	95							19		56																				8												
Rein 452-0	104-3	Midden	Viking	7.5	90	89						1	17	1	36																				18							2				1	

Farm	Context - Sample	Context Type	Period	Vol. floated (L)	Total Seeds	Total Charred	Apiaceae	Asteraceae	Leontoden	Taraxacum	Myosotis	Capsella	Caryophyllaceae	Chenopodium	Cyperaceae	Ericaceae	Arctostaphylos	Empetrum	Vaccinium	Fabaceae	Lupinus	Trifolium	Juncaceae	Lamiaceae	Linaceae	Linum	Menyanthes	Epilobium	Rhinanthus	Cereal	cf Avena	Hordeum	Poaceae large	Lolium	Poaceae Wild	Polygonaceae	Polygonum	Rumex	Montia fontana	Portulaca	Potamogeton	Ranunculus	Rosaceae	Rubus	Galium	Violaceae	Viola
Rein 452-0	102-1	Cultural Layer	Modern	6.5	49	35							7		17			22																	3												
Rein 452-0	103-4	Midden	Medieval	7	0	0																																									
Rein 452-0	104-6	Midden	Medieval	6.5	40	19							2		16			8																					14								
Rein 452-0	104-8	Midden	Medieval	7	168	163							29		61			2																	23							5					
Rein 452-0	104-9	Midden	Medieval	7	17	17							4		4			1																													
Rein 452-0	105-10	Midden	Viking	5.5	42	42							30		9			2																													
Rein 452-0	106-12	Midden	Viking	6.5	35	35							8	1	23																				1												
Rein 452-0	106-17	Midden	Viking	7	71	71							14		23			4																	6												
Rein 452-0	107-14	Cultural Layer	Viking	5	0	0																																									
Rein 452-0	108-16	Aeolian	Viking	6	0	0																																									
Keta 454-0	103-3	Midden	Medieval	7.5	73	27						36	18		7			1									1								10												
Keta 454-0	103-5	Midden	Medieval	6	376	134							371		5																																
Keta 454-0	104-6	Midden	Viking	8	0	0																																									
Keta 454-0	105-8	Midden	Viking	8	97	30							85		10																												1				
Keta 454-0	106-10	Midden	Viking	7	1,162	176							958		55			4									4								8				41			1					
Keta 454-0	106-12	Midden	Viking	14.5	1,942	33							1,909		15												13																				
Keta 454-0	107-13	Aeolian	Viking	8	1	0							1																																		
Hamar 455-0	102-1	Midden	Medieval	8	263	260		1					68		37			4									12								133											1	
Hamar 455-0	103-3	Midden	Viking	8	268	261							216		24			4									11								8								1				
Hamar 455-0	103-11	Midden	Viking	7.5	249	242							14		173												3								10				38								
Hamar 455-0	104-5	Midden	Viking	8.5	96	94		1					56		19																				10				2			1				2	
Hamar 455-0	105-7	Midden	Viking	8	187	162							20		119			4									6									1			25			2					
Hamar 455-0	106-9	Midden	Viking	8	193	193							3		162												18								8												
Hamar 455-0	106-11	Midden	Viking	8	248	248		10					14		165																				7	7			38						3		
Hamar 455-0	107-12	Natural turf	Viking	7.5	14	14							3		6			1														1															
Hendilkot 455-1	103-2	Midden	Medieval	16	14	14							4	1	3			2									1																			1	
Hendilkot 455-1	104-4	Midden	Medieval	14	6	6							1		3												2																				
Hendilkot 455-1	104-7	Midden	Medieval	14	63	62							12		45												5																1				
Hendilkot 455-1	105-9	Midden	Viking	15	52	44							12		15			3									6											2				5					
Hendilkot 455-1	106-12	Midden	Viking	15	19	19							1		9																				9												
Hendilkot 455-1	106-14	Midden	Viking	15	20	14							5		6												6								3												
Hendilkot 455-1	106-16	Midden	Viking	15.5	15	14									8												3								1							1	2				
Hendilkot 455-1	107-18	Aeolian	Viking	13.5	0	0																																									
Hendilkot 455-1	108-21	Aeolian	Viking	14.5	0	0																																									
Hendilkot 455-1	871-22	Tephra	Viking	8	0	0																																									
Hendilkot 455-1	934-19	Tephra	Viking	7	1	1							1																																		
Hendilkot 455-1	1104-8	Tephra	Medieval	8	4	4							4																																		

APPENDIX B. TAXA IDENTIFIED BY SAMPLE AT LANGHOLT FARMS

Farm	Context - Sample	Context Type	Period	Vol. floated (L)	Total Seeds	Total Charred	Apiaceae	Asteraceae	Leontoden	Taraxacum	Myosotis	Capsella	Caryophyllaceae	Chenopodium	Cyperaceae	Ericaceae	Arctostaphylos	Empetrum	Vaccinium	Fabaceae	Lupinus	Trifolium	Juncaceae	Lamiaceae	Linaceae	Linum	Menyanthes	Epilobium	Rhinanthus	Cereal	cf Avena	Hordeum	Poaceae large	Lolium	Poaceae Wild	Polygonaceae	Polygonum	Rumex	Montia fontana	Portulaca	Potamogeton	Ranunculus	Rosaceae	Rubus	Galium	Violaceae	Viola
Kjartansstaðir 57-0	107-1	Midden	Medieval	4	296	3							11					3																					278								
Kjartansstaðir 57-0	107-2	Midden	Medieval	4	235	13							222		4																				3												6
Kjartansstaðir 57-0	108-3	Midden	Viking	4	615	613							20		16					1															2				573								
Kjartansstaðir 57-0	108-4	Midden	Viking	4	1,139	0				2			12		3			6	1																1				1,114								
Kjartansstaðir 57-0	109-6	Midden	Viking	4	2,101	2,100							3					4														2			2	1			2,088								
Kjartansstaðir 57-0	871-7	Tephra	Viking	4	1	0							1																																		
Páfastaðir 59-0	103-3	Midden	Medieval	4	39	32	1						7		18																				10												1
Páfastaðir 59-0	105-4	Midden	Medieval	4	29	19							6		6																				16												
Páfastaðir 59-0	105-5	Midden	Medieval	4	7	6							4		1			1																								1					
Páfastaðir 59-0	108-1	Midden	Medieval	4	13	12							3		3			1																	4												
Páfastaðir 59-0	109-2	Midden	Medieval	4	4	4							3		1																																
Páfastaðir 59-0	109-6	Midden	Medieval	4	15	15							12																						3												
Páfastaðir 59-0	112-11	Midden	Modern	4	117	92							32		36			2																	39							1	6	1			
Páfastaðir 59-0	113-12	Midden	Modern	4	165	99							34		21			2																	55		35		3			1	14				
Páfastaðir 59-0	115-13	Midden	Medieval	4	7,898	0							7,637					1									4								1		253		1				1				
Páfastaðir 59-0	117-14	Midden	Medieval	4	113	3							108		2			1																									2				
Páfastaðir 59-0	117-15	Midden	Medieval	4	9	1							9																																		
Páfastaðir 59-0	117-16	Midden	Medieval	4	261	22							67																						11				136				47				
Páfastaðir 59-0	117-21	Midden	Medieval	4	97	2							2																										95								
Páfastaðir 59-0	117-22	Midden	Medieval	4	843	27							23		2																				2				816								
Páfastaðir 59-0	117-23	Midden	Medieval	4	41	26							17		2																				7				11								4
Páfastaðir 59-0	118-17	Midden	Viking	4	338	0																																	338								
Páfastaðir 59-0	871-18	Tephra	Viking	4	9	0																																	9								
Litla-Gröf (Syðri) 60-0	104-1	Midden	Medieval	4	284	5							18		1																					1			264								
Litla-Gröf (Syðri) 60-0	104-2	Midden	Medieval	4	96	6									2			1																	2				90								
Litla-Gröf (Syðri) 60-0	105-3	Midden	Viking	4	87	68							52		4			4																	27												
Litla-Gröf (Syðri) 60-0	106-4	Midden	Viking	4	121	23						1	21		9			1																		3			84								
Litla-Gröf (Syðri) 60-0	107-5	Midden	Viking	4	122	0							70		46					1															2												
Litla-Gröf (Syðri) 60-0	108-6	Midden	Viking	4	25	16							9		15																																
Litla-Gröf (Syðri) 60-0	108-7	Midden	Viking	4	22	19							7		15																																
Litla-Gröf (Syðri) 60-0	109-8	Midden	Viking	4	78	78							3		73																				2												
Litla-Gröf (Syðri) 60-0	110-9	Midden	Viking	4	25	24							19		6																																
Litla-Gröf (Syðri) 60-0	110-11	Midden	Viking	4	77	38							64		7																				1	4						1					
Litla-Gröf (Syðri) 60-0	110-12	Midden	Viking	4	15	11							5		10																																
Litla-Gröf (Syðri) 60-0	111-13	Midden	Viking	4	21	8							17		3																				1												
Litla-Gröf (Syðri) 60-0	112-15	Midden	Viking	4	16	1							16																																		
Litla-Gröf (Syðri) 60-0	871-14	Midden	Viking	4	1	1									1																																
Stóra-Gröf 61-0	108-1	Mixed Turf	Medieval	4	16	0							13		1																															1	
Stóra-Gröf 61-0	110-2	Midden	Medieval	4	482	206							156		215																				23	13	1	3			5					58	
Stóra-Gröf 61-0	111-3	Midden	Medieval	4	793	636							348		319			11																	75	10		1			6	2				21	
Stóra-Gröf 61-0	113-4	Midden	Medieval	4	12	4							4																							4											1
Stóra-Gröf 61-0	113-5	Midden	Medieval	4	34	6							26		2																					5										1	
Stóra-Gröf 61-0	113-8	Midden	Medieval	4	3,968	3							2																						1				3,964							1	
Stóra-Gröf 61-0	113-9	Midden	Medieval	4	5,057	5,057							1		2																					2			5,048							4	
Stóra-Gröf 61-0	114-6	Midden	Viking	4	9,332	4									3																				1				9,328								
Stóra-Gröf 61-0	114-10	Midden	Viking	4	167	1							1		1																								165								
Stóra-Gröf 61-0	114-11	Midden	Viking	4	2,736	1							1									1																	2,732							2	
Stóra-Gröf 61-0	115-13	Midden	Viking	4	10	8							2					2																	1	2			3								
Stóra-Gröf 61-0	115-14	Midden	Viking	4	1	1																														1											
Stóra-Gröf 61-0	115-17	Midden	Viking	4	6	1							5																						1												
Stóra-Gröf 61-0	115-18	Midden	Viking	4	1	0							1																																		
Stóra-Gröf 61-0	116-12	Midden	Viking	2	5	5							1																																		
Stóra-Gröf 61-0	117-16	Midden	Viking	4	1	0							1																																		
Stóra-Gröf 61-0	121-19	Aeolian	Medieval	4	52	7							35		1																							16									
Stóra-Gröf 61-0	122-20	Midden	Viking	4	32	5							24																									8									

Farm	Context - Sample	Context Type	Period	Vol. floated (L)	Total Seeds	Total Charred	Apiaceae	Asteraceae	Leontoden	Taraxacum	Myosotis	Capsella	Caryophyllaceae	Chenopodium	Cyperaceae	Ericaceae	Arctostaphylos	Empetrum	Vaccinium	Fabaceae	Lupinus	Trifolium	Juncaceae	Lamiaceae	Linaceae	Linum	Menyanthes	Epilobium	Rhinanthus	Cereal	cf Avena	Hordeum	Poaceae large	Lolium	Poaceae Wild	Polygonaceae	Polygonum	Rumex	Montia fontana	Portulaca	Potamogeton	Ranunculus	Rosaceae	Rubus	Galium	Violaceae	Viola
Stóra-Gröf 61-0	123-21	Midden	Viking	4	23	2							15		1			1																				6									
Stóra-Gröf 61-0	123-22	Midden	Viking	4	71	18							54																									17									
Stóra-Gröf 61-0	124-23	Midden	Viking	4	36	7							26																						1	1		8									
Stóra-Gröf 61-0	125-24	Midden	Viking	4	15	4							11		1			1																				2									
Stóra-Gröf 61-0	126-25	Midden	Viking	4	20	7							13																									7									
Stóra-Gröf 61-0	127-26	Midden	Viking	4	75	1							58		2																				1			14									
Stóra-Gröf 61-0	128-27	Midden	Viking	4	8	2							7																									1									
Stóra-Gröf 61-0	129-28	Aeolian	Prehistoric	4	8	3							8																																		
Holtsmúli 62-0	1-1	Midden	Medieval	4	18	9							6	2	8																				1								1				
Holtsmúli 62-0	2-2	Midden	Viking	4	53	41							47					1																	5												
Holtsmúli 62-0	3-3	Midden	Viking	4	28	27							17		3																	1			7												
Holtsmúli 62-0	4-4	Aeolian	Prehistoric	4	1	0																													1												
Lower Seyla 104-1	118-2	Cultural Layer	Medieval	1	3	3							2																						1												
Lower Seyla 104-1	156-21	Collapse	Viking	4	6	5							2		2																				1				1								
Lower Seyla 104-1	127-47	Disturbed	Modern	4	15	15							7		6			1																	1												
Lower Seyla 104-1	133-4	Midden	Medieval	4	35	35							17		8			1																	9												
Lower Seyla 104-1	133-5	Midden	Medieval	4	57	56							37		8			1																	11												
Lower Seyla 104-1	133-6	Midden	Medieval	4	32	32							12		14															1					4												
Lower Seyla 104-1	133-7	Midden	Medieval	4	24	24							8		10			2																	1				3								
Lower Seyla 104-1	134-9	Midden	Medieval	4	196	196							68		78			4																	46												
Lower Seyla 104-1	134-10	Midden	Medieval	4	316	313							225		23			1									3								64												
Lower Seyla 104-1	145-11	Midden	Modern	4	12	12							12																																		
Lower Seyla 104-1	145-12	Midden	Modern	4	103	103							77		7			1																	18												
Lower Seyla 104-1	145-13	Midden	Modern	4	77	77							62		3																	1			11												
Lower Seyla 104-1	148-14	Midden	Medieval	4	8	8							2																						6												
Lower Seyla 104-1	148-15	Midden	Medieval	4	5	5							1		2																				2												
Lower Seyla 104-1	169-67	Midden	Viking	4	167	167							61		77			1																	28												
Lower Seyla 104-1	169-68	Midden	Viking	4	343	343							331		1																				10												
Lower Seyla 104-1	169-69	Midden	Viking	4	310	304							271		15			4																	20												
Lower Seyla 104-1	169-70	Midden	Viking	4	92	92							75		9			1																	7												
Lower Seyla 104-1	171-71	Midden	Viking	4	41	41							32		2																				7												
Lower Seyla 104-1	171-72	Midden	Viking	4	157	157							137		9																				7												
Lower Seyla 104-1	171-73	Midden	Viking	4	654	636							605		28			2																	18							1					
Lower Seyla 104-1	171-74	Midden	Viking	4	17	17							2		8																				7												
Lower Seyla 104-1	173-83	Midden	Viking	4	128	119							105		8			2																	11												
Lower Seyla 104-1	173-84	Midden	Viking	4	215	200							174		16			2												1					21												
Lower Seyla 104-1	173-85	Midden	Viking	4	634	383							414		35			3																	26		148		8								
Lower Seyla 104-1	173-86	Midden	Viking	4	543	315							476		40			1																	11		9		4				2				
Lower Seyla 104-1	173-87	Midden	Viking	4	186	143							137		15			3																	26												
Lower Seyla 104-1	173-88	Midden	Viking	4	174	100							157		5																				12												
Lower Seyla 104-1	182-103	Midden	Viking	4	178	113							150		14			1																	13												
Lower Seyla 104-1	182-104	Midden	Viking	4	162	80							133		16																				13												
Lower Seyla 104-1	182-105	Midden	Viking	4	650	406							558		55			4																	32												
Lower Seyla 104-1	182-106	Midden	Viking	4	1,236	626							1,022		63			4									3								20				120		4						
Lower Seyla 104-1	182-107	Midden	Viking	4	84	56							58		15																				10												
Lower Seyla 104-1	182-108	Midden	Viking	4	127	42							109		6																				11												
Lower Seyla 104-1	187-113	Midden	Viking	4	181	43							107		27			2									18								20		7										
Lower Seyla 104-1	187-114	Midden	Viking	4	64	28							57		2																				5												
Lower Seyla 104-1	187-115	Midden	Viking	4	361	291							207		62												9								61		1		20				1				
Lower Seyla 104-1	187-116	Midden	Viking	4	141	35							103		11												9								18												
Lower Seyla 104-1	187-117	Midden	Viking	4	79	73							39		18			1																	17												
Lower Seyla 104-1	187-118	Midden	Viking	4	124	89							81		10																				30				3								
Lower Seyla 104-1	193-121	Midden	Viking	4	623	334							427		71			2									16								90		3		14								
Lower Seyla 104-1	193-122	Midden	Viking	4	54	54							46		5																				3												
Lower Seyla 104-1	193-123	Midden	Viking	4	169	169							149		6																				13												
Lower Seyla 104-1	193-124	Midden	Viking	4	79	59							40		16																				22												

Farm	Context - Sample	Context Type	Period	Vol. floated (L)	Total Seeds	Total Charred	Apiaceae	Asteraceae	Leontoden	Taraxacum	Myosotis	Capsella	Caryophyllaceae	Chenopodium	Cyperaceae	Ericaceae	Arctostaphylos	Empetrum	Vaccinium	Fabaceae	Lupinus	Trifolium	Juncaceae	Lamiaceae	Linaceae	Linum	Menyanthes	Epilobium	Rhinanthus	Cereal	cf Avena	Hordeum	Poaceae large	Lolium	Poaceae Wild	Polygonaceae	Polygonum	Rumex	Montia fontana	Portulaca	Potamogeton	Ranunculus	Rosaceae	Rubus	Galium	Violaceae	Viola
Lower Seyla 104-1	194-119	Midden	Viking	4	354	146							247		91																	1			15												
Lower Seyla 104-1	194-120	Midden	Viking	4	640	318							563		28			1									1								29		15		3								
Lower Seyla 104-1	194-125	Midden	Viking	4	489	203							391	1	47			3																	21		20		5				1				
Lower Seyla 104-1	194-126	Midden	Viking	4	4,274	53							4,206		63			2														1			2												
Lower Seyla 104-1	194-127	Midden	Viking	4	97	97							66		3			4																	24												
Lower Seyla 104-1	194-128	Midden	Viking	4	323	206							265	2	14			3														1			30		2		6								
Lower Seyla 104-1	199-131	Midden	Viking	4	13	2							2		4																				1				6								
Lower Seyla 104-1	199-132	Midden	Viking	4	25	1							2		2																				1				20								
Lower Seyla 104-1	199-133	Midden	Viking	4	15	2							2																										13								
Lower Seyla 104-1	199-134	Midden	Viking	4	22	0							6		2																								14								
Lower Seyla 104-1	199-135	Midden	Viking	4	1	1									1																																
Lower Seyla 104-1	199-136	Midden	Viking	4	3	0									1																				1				1								
Lower Seyla 104-1	200-139	Midden	Viking	4	222	0							220																						2												
Lower Seyla 104-1	200-140	Midden	Viking	4	139	0							139																																		
Lower Seyla 104-1	200-141	Midden	Viking	4	13	1							9																						1				3								
Lower Seyla 104-1	200-142	Midden	Viking	4	2	0							1																						1												
Lower Seyla 104-1	200-143	Midden	Viking	4	0	0																																									
Lower Seyla 104-1	201-145	Midden	Viking	4	5	2							2																										1								
Lower Seyla 104-1	201-146	Midden	Viking	4	2	1									2																																
Lower Seyla 104-1	201-147	Midden	Viking	4	2	1									2																																
Lower Seyla 104-1	201-148	Midden	Viking	4	4	4									2																				2												
Lower Seyla 104-1	201-149	Midden	Viking	4	0	0																																									
Lower Seyla 104-1	201-150	Midden	Viking	4	2	2									1																	1															
Lower Seyla 104-1	202-151	Upcast	Viking	4	0	0																																									
Lower Seyla 104-1	202-152	Upcast	Viking	4	0	0																																									
Lower Seyla 104-1	871-153	Tephra	Viking	4	0	0																																									
Lower Seyla 104-1	871-154	Tephra	Viking	4	0	0																																									
Torfgarður 106-0	104-1	Midden	Medieval	4	26	19							12		5																				2				7								
Torfgarður 106-0	104-2	Midden	Medieval	4	126	19							12		6																				1				107								
Torfgarður 106-0	104-3	Midden	Medieval	4	17	5							3		1			1																	12												
Torfgarður 106-0	104-4	Midden	Medieval	4	15	9							10		5																																
Torfgarður 106-0	104-5	Midden	Medieval	4	2	2							2																																		
Torfgarður 106-0	104-6	Midden	Medieval	4	76	72							64		8																				3		1										
Torfgarður 106-0	104-7	Midden	Medieval	4	0	0																																									
Torfgarður 106-0	104-8	Midden	Medieval	4	2	2							1																						1												
Torfgarður 106-0	104-9	Midden	Medieval	4	6	6							3		1																				1												
Torfgarður 106-0	105-10	Midden	Medieval	2	2	2									1			1																													
Torfgarður 106-0	105-11	Midden	Medieval	2	0	0																																									
Torfgarður 106-0	105-12	Midden	Medieval	2	30	4							2		1																				1				26								
Torfgarður 106-0	105-13	Midden	Medieval	4	0	0																																									
Torfgarður 106-0	105-14	Midden	Medieval	2	10	10							6		2			1																	1												
Torfgarður 106-0	105-15	Midden	Medieval	4	52	17							13		3																				3				33								
Torfgarður 106-0	105-16	Midden	Medieval	4	1	1							1																																		
Torfgarður 106-0	105-17	Midden	Medieval	4	3	3							2		1																																
Torfgarður 106-0	105-18	Midden	Medieval	4	5	5							2		3																																
Torfgarður 106-0	106-19	Midden	Medieval	4	5	5							1		1																				3												
Torfgarður 106-0	106-20	Midden	Medieval	4	17	14							1		3			7																	3				3								
Torfgarður 106-0	106-21	Midden	Medieval	4	15	15							6		3			4																	2												
Torfgarður 106-0	106-22	Midden	Medieval	4	40	36							16		17																				7												
Torfgarður 106-0	106-23	Midden	Medieval	4	26	24							8		8			3																	7												
Torfgarður 106-0	106-24	Midden	Medieval	4	60	59							40		7			9																	4												
Torfgarður 106-0	106-25	Midden	Medieval	4	121	33							28		5																				88												
Torfgarður 106-0	106-26	Midden	Medieval	4	70	66							61		3																				6												
Torfgarður 106-0	106-27	Midden	Medieval	4	10	10									8			1																	1												
Torfgarður 106-0	107-28	Midden	Medieval	4	30	30							7		12			1																	10												
Torfgarður 106-0	107-29	Midden	Medieval	4	12	12							2		5			1																	4												

Farm	Context - Sample	Context Type	Period	Vol. floated (L)	Total Seeds	Total Charred	Apiaceae	Asteraceae	Leontoden	Taraxacum	Myosotis	Capsella	Caryophyllaceae	Chenopodium	Cyperaceae	Ericaceae	Arctostaphylos	Empetrum	Vaccinium	Fabaceae	Lupinus	Trifolium	Juncaceae	Lamiaceae	Linaceae	Linum	Menyanthes	Epilobium	Rhinanthus	Cereal	cf Avena	Hordeum	Poaceae large	Lolium	Poaceae Wild	Polygonaceae	Polygonum	Rumex	Montia fontana	Portulaca	Potamogeton	Ranunculus	Rosaceae	Rubus	Galium	Violaceae	Viola
Torfgarður 106-0	107-30	Midden	Medieval	4	39	36							25		9																				4		1										
Torfgarður 106-0	107-31	Midden	Medieval	4	82	21							22		9			2																	47												
Torfgarður 106-0	107-32	Midden	Medieval	4	47	27							19		5																				23												
Torfgarður 106-0	108-33	Midden	Medieval	4	22	20							2		18																				2												
Torfgarður 106-0	108-34	Midden	Medieval	4	25	23							6		14																				4												
Torfgarður 106-0	108-35	Midden	Medieval	4	9	9							2		5																				2												
Torfgarður 106-0	108-36	Midden	Medieval	4	22	22							6		8																				8												
Torfgarður 106-0	108-37	Midden	Medieval	4	37	34							11		16																				9												
Torfgarður 106-0	108-38	Midden	Medieval	4	29	29							4		9			1																	7												
Torfgarður 106-0	108-39	Midden	Medieval	4	24	22							10		12																				2												
Torfgarður 106-0	108-40	Midden	Medieval	4	17	15							10		3																				4												
Torfgarður 106-0	108-41	Midden	Medieval	4	26	26							13		5			4																	3												
Torfgarður 106-0	109-42	Midden	Viking	4	21	21							18		2																				1												
Torfgarður 106-0	109-43	Midden	Viking	4	14	13							5		8																						1										
Torfgarður 106-0	109-44	Midden	Viking	4	7	7							3		1																				3												
Torfgarður 106-0	109-45	Midden	Viking	4	25	25							14		9																				2												
Torfgarður 106-0	109-46	Midden	Viking	4	23	23							6		8																				8												
Torfgarður 106-0	109-47	Midden	Viking	4	11	11							8		2																				1												
Torfgarður 106-0	109-48	Midden	Viking	4	25	19							5		11																				9												
Torfgarður 106-0	109-49	Midden	Viking	4	3	3							1																						2												
Torfgarður 106-0	109-50	Midden	Viking	4	7	7									5			1																	1												
Torfgarður 106-0	109-51	Midden	Viking	4	9	9							3		4																				1												
Torfgarður 106-0	110-52	Midden	Viking	4	3	3							2																						1												
Torfgarður 106-0	110-53	Midden	Viking	4	0	0																																									
Torfgarður 106-0	110-54	Midden	Viking	4	4	4							2																						2												
Torfgarður 106-0	110-55	Midden	Viking	4	0	0																																									
Torfgarður 106-0	110-56	Midden	Viking	4	1	1									1																																
Torfgarður 106-0	110-57	Midden	Viking	4	0	0																																									
Torfgarður 106-0	110-58	Midden	Viking	4	95	83							81		2																				10		2										
Torfgarður 106-0	110-59	Midden	Viking	4	19	18							18																						1												
Torfgarður 106-0	110-60	Midden	Viking	4	5	5							5																																		
Torfgarður 106-0	871-61	Tephra	Viking	4	1	1							1																																		
Torfgarður 106-0	871-62	Tephra	Viking	4	0	0																																									
Torfgarður 106-0	871-63	Tephra	Viking	4	1	1							1																																		
Torfgarður 106-0	871-64	Tephra	Viking	4	3	3							2		1																																
Torfgarður 106-0	871-65	Tephra	Viking	4	0	0																																									
Torfgarður 106-0	871-66	Tephra	Viking	4	0	0																																									
Torfgarður 106-0	871-67	Tephra	Viking	4	0	0																																									
Torfgarður 106-0	871-68	Tephra	Viking	4	1	1							1																																		
Torfgarður 106-0	871-69	Tephra	Viking	4	0	0																																									
Halldórsstaðir 109-0	103-1	Midden	Medieval	2	29	7							7		10			1																	6	1					1	2	1				
Halldórsstaðir 109-0	104-2	Midden	Medieval	2	841	6							528		10												1								4		39		238		8		12				
Halldórsstaðir 109-0	105-3	Midden	Viking	2	124	31							21		7																				7				86		2		1				
Halldórsstaðir 109-0	106-4	Aeolian	Viking	4	438	4						357	4		2																				11				64								
Halldórsstaðir 109-0	107-5	Tephra	Viking	4	2	0																													1								1				
Lower Glaumbær 111-1	101-101	Topsoil	Modern	4	1	0							1																																		
Lower Glaumbær 111-1	102-109	Midden	Viking	4	36	36							28		1																				6						1						
Lower Glaumbær 111-1	102-110	Midden	Viking	4	31	31							13		2			1																	14												
Lower Glaumbær 111-1	102-111	Midden	Viking	4	14	14							8																						6												
Lower Glaumbær 111-1	102-112	Midden	Viking	4	342	342						2	314						2																24												
Lower Glaumbær 111-1	102-113	Midden	Viking	4	95	95							83		4																				8												
Lower Glaumbær 111-1	102-114	Midden	Viking	4	39	36							25		8																				6												
Lower Glaumbær 111-1	102-115	Midden	Viking	4	37	36							24		6																				6								1				
Lower Glaumbær 111-1	102-116	Midden	Viking	4	28	28							17		3																				8												
Lower Glaumbær 111-1	102-123	Midden	Viking	4	15	15							8																						7												
Lower Glaumbær 111-1	102-124	Midden	Viking	4	45	42						1	31		3																				10												

Farm	Context - Sample	Context Type	Period	Vol. floated (L)	Total Seeds	Total Charred	Apiaceae	Asteraceae	Leontoden	Taraxacum	Myosotis	Capsella	Caryophyllaceae	Chenopodium	Cyperaceae	Ericaceae	Arctostaphylos	Empetrum	Vaccinium	Fabaceae	Lupinus	Trifolium	Juncaceae	Lamiaceae	Linaceae	Linum	Menyanthes	Epilobium	Rhinanthus	Cereal	cf Avena	Hordeum	Poaceae large	Lolium	Poaceae Wild	Polygonaceae	Polygonum	Rumex	Montia fontana	Portulaca	Potamogeton	Ranunculus	Rosaceae	Rubus	Galium	Violaceae	Viola
Lower Glaumbær 111-1	102-125	Midden	Viking	4	49	47							12		12			1																	24												
Lower Glaumbær 111-1	103-117	Midden	Viking	4	50	50						2	30		2												5								10												
Lower Glaumbær 111-1	103-118	Midden	Viking	4	39	39							21		3												1								14												
Lower Glaumbær 111-1	103-120	Midden	Viking	4	60	54							40		4												1								14		1										
Lower Glaumbær 111-1	103-121	Midden	Viking	4	490	489						1	455		11												1								17								5				
Lower Glaumbær 111-1	103-122	Midden	Viking	4	111	60							95		13																				3												
Lower Glaumbær 111-1	103-126	Midden	Viking	4	54	41							39		3			2									1								9												
Lower Glaumbær 111-1	103-127	Midden	Viking	4	50	49							29		3																				18												
Lower Glaumbær 111-1	103-128	Midden	Viking	4	25	23							13		2			1																	9												
Lower Glaumbær 111-1	104-129	Midden	Viking	4	73	51							52		5																				16												
Lower Glaumbær 111-1	104-130	Midden	Viking	4	89	56							47		6												15					1			18				2								
Lower Glaumbær 111-1	104-131	Midden	Viking	4	121	71						1	82		4							3					17								14												
Lower Glaumbær 111-1	104-132	Midden	Viking	4	85	48							49		24												5								7												
Lower Glaumbær 111-1	104-133	Midden	Viking	4	63	40							36		4												12								3												
Lower Glaumbær 111-1	104-134	Midden	Viking	4	55	21							40		5												4								6												
Lower Glaumbær 111-1	104-135	Midden	Viking	4	79	71							53		10												6								10												
Lower Glaumbær 111-1	104-136	Midden	Viking	4	116	113							87		11																				18												
Lower Glaumbær 111-1	104-137	Midden	Viking	4	29	29							14		4				1																7	2			1								
Lower Glaumbær 111-1	105-138	Midden	Viking	4	1,246	1,246							1,095		4			1																	146												
Lower Glaumbær 111-1	105-139	Midden	Viking	4	273	273							262		6																				5												
Lower Glaumbær 111-1	105-140	Midden	Viking	4	147	147							128		5			1																	13												
Lower Glaumbær 111-1	106-144	Mixed Turf	Viking	4	15	15							4		6																				5												
Lower Glaumbær 111-1	106-145	Mixed Turf	Viking	4	4	4							2		1																				1												
Lower Glaumbær 111-1	107-141	Midden	Viking	4	134	118							114		8												1			1					10												
Lower Glaumbær 111-1	107-142	Midden	Viking	4	14	11							8		2																				4												
Lower Glaumbær 111-1	107-143	Midden	Viking	4	91	84							60		6			2									1								22												
Lower Glaumbær 111-1	107-159	Midden	Viking	4	12	4							10		1																																
Lower Glaumbær 111-1	107-160	Midden	Viking	4	40	40							11		8												1								20												
Lower Glaumbær 111-1	108-161	Midden	Viking	4	270	251							113		100			2	3								2								39				11								
Lower Glaumbær 111-1	108-162	Midden	Viking	4	202	188							83		67			5																	45				2								
Lower Glaumbær 111-1	109-163	Midden	Viking	4	164	59							157														1								4				2								
Lower Glaumbær 111-1	109-164	Midden	Viking	4	13	12							12																						1												
Lower Glaumbær 111-1	109-165	Midden	Viking	4	7	6							6																						1												
Lower Glaumbær 111-1	109-166	Midden	Viking	4	36	36							29		5																				2												
Lower Glaumbær 111-1	109-167	Midden	Viking	4	5	5							4																						1												
Lower Glaumbær 111-1	109-168	Midden	Viking	4	15,300	146				1			15,129		65			10									32								24				7			12	14				
Lower Glaumbær 111-1	110-102	Midden	Medieval	4	12	6							10		1																								1								
Lower Glaumbær 111-1	110-103	Midden	Medieval	4	2	2							2																																		
Lower Glaumbær 111-1	110-104	Midden	Medieval	4	4	2							1		1																				2												
Lower Glaumbær 111-1	110-105	Midden	Medieval	4	3	3							2		1																																
Lower Glaumbær 111-1	110-106	Midden	Medieval	4	25	23							14		3																				8												
Lower Glaumbær 111-1	110-107	Midden	Medieval	4	5	5							3																						2												
Lower Glaumbær 111-1	110-108	Midden	Medieval	4	24	24							6																						18												
Lower Glaumbær 111-1	111-169	Midden	Viking	3.3	128	40							114		4															1		9															
Lower Glaumbær 111-1	112-170	Floor	Viking	4	4	4							2		1																				1												
Lower Glaumbær 111-1	113-171	Aeolian	Prehistoric	4	0	0																																									
Lower Glaumbær 111-1	114-172	Midden	Viking	4	39	18							22		2																				14												
Lower Glaumbær 111-1	115-174	Mixed Turf	Viking	4	14	14						1	7	1	3																				1				1								
Lower Glaumbær 111-1	115-179	Mixed Turf	Viking	4	27	27							12		6																				8												
Lower Glaumbær 111-1	115-189	Mixed Turf	Viking	4	3	3							3																																		
Lower Glaumbær 111-1	116-176	Floor	Viking	4	63	63							24		27																				12												
Lower Glaumbær 111-1	117-173	Floor	Viking	4	266	39							247		14																				5												
Lower Glaumbær 111-1	118-180	Collapse	Viking	4	12	6							11		1																																
Lower Glaumbær 111-1	118-187	Collapse	Viking	4	15	13							11		4																																
Lower Glaumbær 111-1	119-186	Floor	Viking	4	57	13							50		2																				4				1								
Lower Glaumbær 111-1	120-183	Floor	Viking	4	44	25							25		12																				4				3								

Farm	Context - Sample	Context Type	Period	Vol. floated (L)	Total Seeds	Total Charred	Apiaceae	Asteraceae	Leontoden	Taraxacum	Myosotis	Capsella	Caryophyllaceae	Chenopodium	Cyperaceae	Ericaceae	Arctostaphylos	Empetrum	Vaccinium	Fabaceae	Lupinus	Trifolium	Juncaceae	Lamiaceae	Linaceae	Linum	Menyanthes	Epilobium	Rhinanthus	Cereal	cf Avena	Hordeum	Poaceae large	Lolium	Poaceae Wild	Polygonaceae	Polygonum	Rumex	Montia fontana	Portulaca	Potamogeton	Ranunculus	Rosaceae	Rubus	Galium	Violaceae	Viola
Lower Glaumbær 111-1	123-175	Fill	Viking	4	19	18							8		8																								3								
Lower Glaumbær 111-1	123-177	Fill	Viking	4	15	9							10		4																							1									
Lower Glaumbær 111-1	123-185	Fill	Viking	4	36	34							15		7																				8				5			1					
Lower Glaumbær 111-1	124-188	Tephra	Prehistoric	3	0	0																																									
Lower Glaumbær 111-1	125-182	Aeolian	Viking	4	0	0																																									
Lower Glaumbær 111-1	125-184	Aeolian	Viking	4	1	1									1																																
Lower Glaumbær 111-1	60-190	Post Hole	Viking	4	0	0																																									
Lower Glaumbær 111-1	61-191	Floor	Viking	4	0	0																																									
Jaðar 114-0	103-1	Midden	Modern	4	88	73							15		49																				22					2							
Jaðar 114-0	103-2	Midden	Modern	4	126	122							10		57																				58												
Jaðar 114-0	103-3	Midden	Modern	4	75	69							20		33																				22												
Jaðar 114-0	103-4	Midden	Modern	4	66	66							2		49																				15												
Jaðar 114-0	103-5	Midden	Modern	4	102	98							6		50			2																	42												
Marbæli old farmstead 115-1	102-15	Topsoil	Modern	6	190	190							40		106			2																	40												
Marbæli old farmstead 115-1	103-16	Midden	Modern	2	55	50							19		21			2																	10	1											
Marbæli old farmstead 115-1	104-17	Midden	Medieval	2	248	247							9		1			1																	2	1			226								5
Marbæli old farmstead 115-1	105-18	Midden	Medieval	2	2	0							1																																		
Marbæli old farmstead 115-1	106-19	Midden	Medieval	2	8	0							2		1																					1			2							1	
Marbæli old farmstead 115-1	107-20	Midden	Medieval	2.2	15	10							1		2																				8	1											
Marbæli old farmstead 115-1	108-21	Midden	Viking	2	27	3							6		6																				3				10								
Marbæli old farmstead 115-1	109-22	Midden	Viking	2	24	20							13		2							1													2	1											
Marbæli old farmstead 115-1	110-1	Floor	Viking	6	53	51							32		8			1																	5	1											
Marbæli old farmstead 115-1	110-2	Floor	Viking	12	165	164							113		19																				29	2			1								
Marbæli old farmstead 115-1	110-3	Floor	Viking	6	115	109							29		36												12					1			14	23											
Marbæli old farmstead 115-1	110-23	Floor	Viking	2	0	0																																									
Meðalheimur 1006-0	103-92	Trough	Modern	2	16	16							3		13																																
Meðalheimur 1006-0	156-135	Midden	Medieval	2	242	241							10		179			1																	46							5					
Meðalheimur 1006-0	184-181	Midden	Viking	3	140	13							22		4																				8				106								
Meðalheimur 1006-0	185-182	Midden	Viking	3	17	14							8		2																				7												
Meðalheimur 1006-0	134-16	Midden	Viking	2	70	70							23		5			30																	7												
Meðalheimur 1006-0	134-17	Midden	Viking	2	30	27							7		3			18																	2												
Meðalheimur 1006-0	134-18	Midden	Viking	2	72	72							26		11			5																	29												
Meðalheimur 1006-0	134-19	Midden	Viking	2	116	112							38		19			34																	24												
Meðalheimur 1006-0	134-20	Midden	Viking	2	130	126							20		10			63																	36												
Meðalheimur 1006-0	134-21	Midden	Viking	2	74	74							21		5			34	1																10												
Meðalheimur 1006-0	134-22	Midden	Viking	2	36	36							13		3			7																	8												
Meðalheimur 1006-0	134-23	Midden	Viking	2	171	170							51	1	30			18																	62		1										
Meðalheimur 1006-0	134-24	Midden	Viking	2	89	89							24		12			13	3																34												
Meðalheimur 1006-0	134-25	Midden	Viking	2	99	92							17		12			24														1			34				7								
Meðalheimur 1006-0	134-26	Midden	Viking	2	95	73							9		24			3	1																34				22								
Meðalheimur 1006-0	134-27	Midden	Viking	2	94	94							31		23			4												3		1			32												
Meðalheimur 1006-0	134-28	Midden	Viking	2	43	43							13		10															5					15												
Meðalheimur 1006-0	134-29	Midden	Viking	2	139	138							99					6												1	1	1			30					1							
Meðalheimur 1006-0	134-30	Midden	Viking	2	143	143							40		30			20													1	3			42				1								
Meðalheimur 1006-0	134-31	Midden	Viking	2	35	35							12		7			5																	8												
Meðalheimur 1006-0	134-32	Midden	Viking	2	67	67							27		11			6																	20												
Meðalheimur 1006-0	134-33	Midden	Viking	2	60	60							22		8			15	1													1			5				2								
Meðalheimur 1006-0	134-34	Midden	Viking	2	37	37							12		6			9																	9				1								
Meðalheimur 1006-0	134-35	Midden	Viking	2	69	67							19		15			2																	30												
Meðalheimur 1006-0	134-36	Midden	Viking	2	86	86							35		12			6												1		1			22				2								5
Meðalheimur 1006-0	134-37	Midden	Viking	2	151	127							28		44			2																	49				24								
Meðalheimur 1006-0	134-38	Midden	Viking	2	84	84							13		24			6																	39												
Meðalheimur 1006-0	134-39	Midden	Viking	2	50	50							12		7			1														1			29												
Meðalheimur 1006-0	134-40	Midden	Viking	2	31	31							7		7			6																	11												
Meðalheimur 1006-0	134-41	Midden	Viking	2	38	35							9		10			4																	12				3								
Meðalheimur 1006-0	134-42	Midden	Viking	2	14	14							5		2			1																	6												

Farm	Context - Sample	Context Type	Period	Vol. floated (L)	Total Seeds	Total Charred	Apiaceae	Asteraceae	Leontoden	Taraxacum	Myosotis	Capsella	Caryophyllaceae	Chenopodium	Cyperaceae	Ericaceae	Arctostaphylos	Empetrum	Vaccinium	Fabaceae	Lupinus	Trifolium	Juncaceae	Lamiaceae	Linaceae	Linum	Menyanthes	Epilobium	Rhinanthus	Cereal	cf Avena	Hordeum	Poaceae large	Lolium	Poaceae Wild	Polygonaceae	Polygonum	Rumex	Montia fontana	Portulaca	Potamogeton	Ranunculus	Rosaceae	Rubus	Galium	Violaceae	Viola
Meðalheimur 1006-0	150-94	Midden	Viking	2	255	255							139		39			5																	65				5								
Meðalheimur 1006-0	150-95	Midden	Viking	2	57	57							19		11			7														1			19												
Meðalheimur 1006-0	150-96	Midden	Viking	2	40	40							13		2			7																	18												
Meðalheimur 1006-0	150-97	Midden	Viking	2	69	69							16		9			8																	36												
Meðalheimur 1006-0	150-98	Midden	Viking	2	84	84							14		10			22												1					36												
Meðalheimur 1006-0	150-99	Midden	Viking	2	23	21							5		4																		9				2								
Meðalheimur 1006-0	150-100	Midden	Viking	2	80	76							50		6			3																	16				4								
Meðalheimur 1006-0	150-101	Midden	Viking	2	135	134							65		25			3																	32		1		1								
Meðalheimur 1006-0	150-102	Midden	Viking	2	163	163							65		26			18																	54												
Meðalheimur 1006-0	150-103	Midden	Viking	2	148	148							84		19			2																	40												
Meðalheimur 1006-0	150-104	Midden	Viking	2	148	148							63		23			8														1			52												
Meðalheimur 1006-0	150-105	Midden	Viking	2	46	46							15		10			1																	17												
Meðalheimur 1006-0	150-106	Midden	Viking	2	145	145							16		46			7	1											2	2	2			67												
Meðalheimur 1006-0	150-107	Midden	Viking	2	117	117							44		15			5																	42												
Meðalheimur 1006-0	150-108	Midden	Viking	2	80	79							41		14			3														1			21												
Meðalheimur 1006-0	150-109	Midden	Viking	2	84	84							28		18			2												1					35												
Meðalheimur 1006-0	150-140	Midden	Viking	2	218	217							63		49			10																	90		1		1								
Meðalheimur 1006-0	150-178	Midden	Viking	2	158	158					2		40		38				1							1				2	1				70								1				
Meðalheimur 1006-0	150-179	Midden	Viking	2	268	268							106		40			4																	118												
Meðalheimur 1006-0	150-180	Midden	Viking	2	160	160							53		30			5												2		1			69												
Meðalheimur 1006-0	162-146	Floor	Viking	2	223	223							99		8			4														1			111												
Meðalheimur 1006-0	162-147	Floor	Viking	2	129	128							70		17			6																	34												
Meðalheimur 1006-0	162-148	Floor	Viking	2	234	234							121		17			5																	91												
Meðalheimur 1006-0	162-149	Floor	Viking	2	377	377							98		72																	1			206												
Meðalheimur 1006-0	162-150	Floor	Viking	2	324	324							183		29			21																	90												
Meðalheimur 1006-0	162-151	Floor	Viking	2	242	241							34		57			6																	145												
Meðalheimur 1006-0	162-152	Floor	Viking	2	212	210							26		67			1														1			114												
Meðalheimur 1006-0	162-153	Floor	Viking	2	225	217							44		66			5												1					109												
Meðalheimur 1006-0	162-154	Floor	Viking	2	238	237							62		35			18	1												2				119				1								
Meðalheimur 1006-0	162-155	Floor	Viking	2	153	153							23		23			5																	102												
Meðalheimur 1006-0	162-156	Floor	Viking	2	285	273							76		84																		109		2		12			1					
Meðalheimur 1006-0	162-157	Floor	Viking	2	112	110							31		25			7																1	44		2		2								
Meðalheimur 1006-0	162-158	Floor	Viking	2	113	113							29		33			14																	37												
Meðalheimur 1006-0	162-159	Floor	Viking	2	138	134							33		30																		75												
Meðalheimur 1006-0	162-160	Floor	Viking	2	273	273							107	2	36			7														1			120												
Meðalheimur 1006-0	162-161	Floor	Viking	2	436	436							74		74			56														2			227												
Meðalheimur 1006-0	162-162	Floor	Viking	2	141	141					1		49		36			5														2			46						1							
Meðalheimur 1006-0	162-163	Floor	Viking	2	139	139							60		17			8																	50												
Meðalheimur 1006-0	162-165	Floor	Viking	3	336	336							190		34			25																	83		1						1					
Meðalheimur 1006-0	162-166	Floor	Viking	3	632	632							105		95			23																	409												
Meðalheimur 1006-0	162-168	Floor	Viking	2	106	106							51		15			11																	29												
Meðalheimur 1006-0	181-318	Peat Ash		2	224	224							11		4			196	2																9												
Meðalheimur 1006-0	202-221	Midden	Modern	4	147	23							93		15			5				9														11										10	
Meðalheimur 1006-0	202-222	Midden	Modern	4	183	31							103		30			13																								7				23	
Meðalheimur 1006-0	202-223	Midden	Modern	4	153	1							99		11			25				1													1								2				12	
Meðalheimur 1006-0	202-224	Midden	Modern	4	261	58							105		65			48																	24							1				18	
Meðalheimur 1006-0	203-225	Midden	Medieval	4	156	29							42		37			3				39													2	22							1				7	
Meðalheimur 1006-0	203-226	Midden	Medieval	4	196	55							103		24			7																	9	26												27	
Meðalheimur 1006-0	203-227	Midden	Medieval	4	126	8							112		6			1																		1												3	
Meðalheimur 1006-0	203-228	Midden	Medieval	4	209	9		2					112		33			5				2													2	8							14				31	
Meðalheimur 1006-0	204-229	Midden	Medieval	4	163	13							133		6			2				7														6												9	
Meðalheimur 1006-0	204-230	Midden	Medieval	4	114	25							62		12			4				17														10							1				8	
Meðalheimur 1006-0	204-231	Midden	Medieval	4	209	17							165		16			3				5														8							2				10	
Meðalheimur 1006-0	204-232	Midden	Medieval	4	193	9							153		14			3				7														2							4				9	
Meðalheimur 1006-0	204-233	Midden	Medieval	4	92	5							74		6																			7							2				3	
Meðalheimur 1006-0	204-234	Midden	Medieval	4	148	10							72		16			8																	1	7							10				32	

Farm	Context - Sample	Context Type	Period	Vol. floated (L)	Total Seeds	Total Charred	Apiaceae	Asteraceae	Leontoden	Taraxacum	Myosotis	Capsella	Caryophyllaceae	Chenopodium	Cyperaceae	Ericaceae	Arctostaphylos	Empetrum	Vaccinium	Fabaceae	Lupinus	Trifolium	Juncaceae	Lamiaceae	Linaceae	Linum	Menyanthes	Epilobium	Rhinanthus	Cereal	cf Avena	Hordeum	Poaceae large	Lolium	Poaceae Wild	Polygonaceae	Polygonum	Rumex	Montia fontana	Portulaca	Potamogeton	Ranunculus	Rosaceae	Rubus	Galium	Violaceae	Viola
Meðalheimur 1006-0	204-235	Midden	Medieval	4	32	2							14		7			1				1														5						3				1	
Meðalheimur 1006-0	204-236	Midden	Medieval	4	419	7							211		20			38				8																				59				83	
Meðalheimur 1006-0	204-237	Midden	Medieval	4	351	5							322		6							5														5										13	
Meðalheimur 1006-0	205-238	Midden	Medieval	4	486	19							412		11							5													1	3						13				24	
Meðalheimur 1006-0	205-239	Midden	Medieval	4	123	6							88		10			4				7														4						3				5	
Meðalheimur 1006-0	205-240	Midden	Medieval	4	711	0							624		8			1				12														29						12				16	
Meðalheimur 1006-0	205-241	Midden	Medieval	4	67	2							61		2																											1				3	
Meðalheimur 1006-0	205-242	Midden	Medieval	4	785	20							694		6			31				4														28						13				7	
Meðalheimur 1006-0	205-243	Midden	Medieval	4	88	3							78		2			2																		2										4	
Meðalheimur 1006-0	205-244	Midden	Medieval	4	24	0							20																																	4	
Meðalheimur 1006-0	205-245	Midden	Medieval	4	699	5							515		4			7				1														6		##				3				16	
Meðalheimur 1006-0	206-246	Midden	Medieval	4	29,942	0							29,798							1																		##				1				1	
Meðalheimur 1006-0	206-247	Midden	Medieval	4	126	3				1			112									3														3		1								6	
Meðalheimur 1006-0	206-248	Midden	Medieval	4	11,097	2							10,965		1							10														3		##				1				12	
Meðalheimur 1006-0	206-251	Midden	Medieval	4	15	1							10					1																		1										3	
Meðalheimur 1006-0	206-252	Midden	Medieval	4	99	4							71		8			4				5													1	6						1				3	
Meðalheimur 1006-0	206-253	Midden	Medieval	4	148	9							130		4			1				5																6								1	
Meðalheimur 1006-0	207-254	Midden	Medieval	4	7,359	0							7,334																									20								5	
Meðalheimur 1006-0	207-255	Midden	Medieval	4	5,880	2							5,594		2							7																##				1				6	
Meðalheimur 1006-0	207-256	Midden	Medieval	4	4,297	1		1					4,256		1			2				7														9						12				9	
Meðalheimur 1006-0	207-257	Midden	Medieval	4	107	1							102																							1		2								2	
Meðalheimur 1006-0	207-258	Midden	Medieval	4	5,713	2							5,651		2							3																19								36	
Meðalheimur 1006-0	207-259	Midden	Medieval	4	13,812	105							13,786		2							1														9										14	
Meðalheimur 1006-0	207-260	Midden	Medieval	4	48	3							44		1																					1										2	
Meðalheimur 1006-0	207-261	Midden	Medieval	4	864	43				3			775		6			9				6														32		2				15				16	
Meðalheimur 1006-0	208-262	Midden	Medieval	4	4,449	0							4,410		4																					1										34	
Meðalheimur 1006-0	208-263	Midden	Medieval	4	969	895							17		1																								892			1				56	
Meðalheimur 1006-0	208-264	Midden	Medieval	4	3,468	9				1			3,437		3			2				2														11		1				1				10	
Meðalheimur 1006-0	208-265	Midden	Medieval	4	21,901	9							21,626					2				20														10		##				4				15	
Meðalheimur 1006-0	209-266	Midden	Medieval	4	1,398	12							1,277		13			1																	1		1	2	40		3		60				
Meðalheimur 1006-0	209-267	Midden	Medieval	4	6,522	2							6,432		8																				1								80				
Meðalheimur 1006-0	209-268	Midden	Medieval	4	15,886	3							15,776		11			2																			14					1	82				
Meðalheimur 1006-0	209-269	Midden	Medieval	4	24,513	171							24,374		2							1															60				1	5	70				
Meðalheimur 1006-0	209-270	Midden	Medieval	4	2,193	42				1			2,069		46			2									9												5			38	22				
Meðalheimur 1006-0	209-271	Midden	Medieval	4	20,558	25				1		2	20,448		20			2									10								4		10		4			43	14				
Meðalheimur 1006-0	210-272	Midden	Medieval	4	4,400	15							4,277		21			3																	1		3		9		7	1	77				
Meðalheimur 1006-0	210-273	Midden	Medieval	4	7,504	4							7,381		8			1									1								2		3					1	107				
Meðalheimur 1006-0	210-274	Midden	Medieval	4	30,083	6,733						4	29,952		39			6									2								17						1		62				
Meðalheimur 1006-0	210-275	Midden	Medieval	4	24,475	617						1	24,352					1																	4		43					4	69				
Meðalheimur 1006-0	211-276	Midden	Medieval	4	24	1									5			2																	2				3				12				
Meðalheimur 1006-0	211-277	Midden	Medieval	4	74	2									2																				1				60		1		10				
Meðalheimur 1006-0	211-278	Midden	Medieval	4	29	11							4		7																				1								17				
Meðalheimur 1006-0	211-279	Midden	Medieval	4	59	10							37		6			1																									15				
Meðalheimur 1006-0	211-280	Midden	Medieval	4	25	5							4		1																												20				
Meðalheimur 1006-0	211-281	Midden	Medieval	4	35	4							4																						1								29				
Meðalheimur 1006-0	211-282	Midden	Medieval	4	20	7							5		4																										1		10				
Meðalheimur 1006-0	211-283	Midden	Medieval	4	67	7							48		3			1																							1		13				
Meðalheimur 1006-0	212-284	Midden	Medieval	4	79	17							8		11												1																59				
Meðalheimur 1006-0	212-285	Midden	Medieval	4	65	19							17		7																												41				
Meðalheimur 1006-0	212-286	Midden	Medieval	4	76	28							12		14			1																	4						1		44				
Meðalheimur 1006-0	212-287	Midden	Medieval	4	61	29							12		14																				4								31				
Meðalheimur 1006-0	212-288	Midden	Medieval	4	71	24							11		12			1																	2								45				
Meðalheimur 1006-0	212-289	Midden	Medieval	4	62	19							25		11			2																	3								21				
Meðalheimur 1006-0	212-290	Midden	Medieval	4	54	23							19		6				1																4								24				
Meðalheimur 1006-0	212-291	Midden	Medieval	4	60	15							29		2			3																	3								23				
Meðalheimur 1006-0	213-292	Midden	Viking	4	411	37							24		11			2																	1				367				6				

Farm	Context - Sample	Context Type	Period	Vol. floated (L)	Total Seeds	Total Charred	Apiaceae	Asteraceae	Leontoden	Taraxacum	Myosotis	Capsella	Caryophyllaceae	Chenopodium	Cyperaceae	Ericaceae	Arctostaphylos	Empetrum	Vaccinium	Fabaceae	Lupinus	Trifolium	Juncaceae	Lamiaceae	Linaceae	Linum	Menyanthes	Epilobium	Rhinanthus	Cereal	cf Avena	Hordeum	Poaceae large	Lolium	Poaceae Wild	Polygonaceae	Polygonum	Rumex	Montia fontana	Portulaca	Potamogeton	Ranunculus	Rosaceae	Rubus	Galium	Violaceae	Viola
Meðalheimur 1006-0	213-293	Midden	Viking	4	24	15							10		2			1																	3								8				
Meðalheimur 1006-0	213-294	Midden	Viking	4	174	40						20	25		2			1																	4				114				8				
Meðalheimur 1006-0	213-295	Midden	Viking	4	45	22						3	11		4			1																	5				11			1	9				
Meðalheimur 1006-0	213-296	Midden	Viking	4	45	19						2	12		2																				3				19			2	4				
Meðalheimur 1006-0	213-297	Midden	Viking	4	14	7				1			4		1																											1	7				
Meðalheimur 1006-0	213-298	Midden	Viking	4	112	18						7	10		8																				1				80				6				
Meðalheimur 1006-0	213-299	Midden	Viking	4	41	7						3	5		1																				1				30				1				
Meðalheimur 1006-0	214-300	Midden	Viking	4	163	7						16	7																										139				1				
Meðalheimur 1006-0	214-301	Midden	Viking	4	12	8						2	4		1																				3								2				
Meðalheimur 1006-0	214-302	Midden	Viking	4	133	4						5	1		2																				1				124								
Meðalheimur 1006-0	214-303	Midden	Viking	4	14	2						10	2																										2								
Meðalheimur 1006-0	214-304	Midden	Viking	4	0	0																																									
Meðalheimur 1006-0	214-305	Midden	Viking	4	100	8						13	5		3																								79								
Meðalheimur 1006-0	214-306	Midden	Viking	4	41	4							1		2																				1				37								
Meðalheimur 1006-0	214-307	Midden	Viking	4	63	2						4	1		1																								54				3				
Meðalheimur 1006-0	215-308	Midden	Viking	4	6	6							1		3																	2															
Meðalheimur 1006-0	217-310	Tephra	Viking	4	1	1																													1												
Meðalheimur 1006-0	218-311	Floor	Viking	4	0	0																																									
Meðalheimur 1006-0	218-312	Floor	Viking	2	173	173						3	43		23			17																	84	3											
Meðalheimur 1006-0	218-313	Floor	Viking	2	53	53							13		9			5																	26												
Meðalheimur 1006-0	218-314	Floor	Viking	2	193	187							87		68																				38												
Meðalheimur 1006-0	218-315	Floor	Viking	2	0	0																																									
Meðalheimur 1006-0	218-316	Floor	Viking	2	4	4									2																				2												
Reynistaður 63-0	102-18	Midden	Modern	4	734	1							222		500			1																	2												
Reynistaður 63-0	103-21	Collapse	Medieval	4	71	0							54		12			5																													
Reynistaður 63-0	104-3	Midden	Medieval	4	333	24							298		13			9																	9					4							
Reynistaður 63-0	104-16	Midden	Medieval	4	1,160	105							1,021		98			7					1				1					6			13		5		4			2	2				
Reynistaður 63-0	105-10	Midden	Medieval	4	3,562	24				2			2,779		8			3									7								9		691		52			11					
Reynistaður 63-0	105-22	Midden	Medieval	2	521	7				3			503					2									3								4				3			2		1			
Reynistaður 63-0	107-9	Midden	Viking	4	6,126	86							5,382	2	8			10																	42		576		56			50					
Reynistaður 63-0	107-13	Midden	Viking	4	1,322	45				1			1,206		88			8									5								7				7								
Reynistaður 63-0	108-6	Midden	Viking	4	4,148	49				2			3,710		314			5																	24				66			26					1
Reynistaður 63-0	108-11	Midden	Viking	4	2,521	1,135							1,544		175			3									1								649	46			53				1				
Reynistaður 63-0	109-4	Midden	Viking	4	1,253	390							1,117		37			7					1									3			85		2										
Reynistaður 63-0	109-17	Midden	Viking	4	16,510	6,371						256	15,744		108			4													1				269		111		14				2	1			
Reynistaður 63-0	110-2	Midden	Viking	4	1,030	17							993		34			1																	2												
Reynistaður 63-0	110-19	Midden	Viking	4	548	147		1					327		138			30	2											2		6			36		3						1				
Reynistaður 63-0	111-15	Midden	Viking	4	327	191							141		154			2														10			8			4	4				1				
Reynistaður 63-0	112-1	Aeolian	Prehistoric	4	12	5				1			10		1																																
Reynistaður 63-0	112-8	Aeolian	Prehistoric	4	30	13							17		10			1																	1								1				
Reynistaður 63-0	10-7	Midden	Viking	4	315	123							102		72		1										109					8			12		1				1						
Reynistaður 63-0	10-20	Midden	Viking	4	61	18							32		21															1		7															
Reynistaður 63-0	11-14	Midden	Viking	2	594	4							532		57			1																	2							2					
Reynistaður 63-0	12-5	Midden	Viking	4	57	31							38		8																	1			7		3										

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